

City of Lake Stevens Mission Statement



The City of Lake Stevens' mission is not only to preserve the natural beauty that attracted so many of its citizens, but to enhance and harmonize with the environment to accommodate new people who desire to live here. Through shared, active participation among Citizen, Mayor, Council, and City Staff, we commit ourselves to quality living for this and future generations.

Growth in our community is inevitable. The City will pursue an active plan on how, when, and where it shall occur to properly plan for needed services, ensure public safety, and maintain the unique ambience that is Lake Stevens.



REGULAR CITY COUNCIL MEETING AGENDA
Lake Stevens School District Educational Service Center (Admin. Bldg.)
12309 22nd Street NE, Lake Stevens
Monday, May 9, 2011 - 7:00 p.m.

NOTE: **WORKSHOP ON VOUCHERS AT 6:45 P.M.**

CALL TO ORDER: 7:00 p.m.
Pledge of Allegiance

ROLL CALL:

NEW EMPLOYEE INTRODUCTIONS: New Associate and Senior Planners.

GUEST BUSINESS:

CONSENT AGENDA:

*A.	Approve May 2011 vouchers.	Barb
*B.	Rescind April 25, 2011 Council motion approving the Snohomish Regional Drug & Gang Task Force Interlocal and approve the revised interlocal.	Randy

ACTION ITEMS:

*A.	Approve minutes of April 25, 2011 regular meeting.	Norma
*B.	Approve suspension of Public Education Government (PEG) capital contribution.	Jan
*C.	Approve revised agreement with the Senior Center.	Jan
*D.	Approve Second Amendment to Interlocal Agreement for Surface Water Management Services with Snohomish County.	Mick

DISCUSSION ITEMS:

*A.	Shoreline Master Plan briefing.	Karen
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COUNCIL PERSON'S BUSINESS:

MAYOR'S BUSINESS:

Lake Stevens City Council Regular Meeting Agenda

May 9, 2011

STAFF REPORTS:

**INFORMATION
ITEMS:**

**EXECUTIVE
SESSION:**

A. Potential Litigation.

ADJOURN:

* ITEMS ATTACHED
** ITEMS PREVIOUSLY DISTRIBUTED
ITEMS TO BE DISTRIBUTED

THE PUBLIC IS INVITED TO ATTEND

Special Needs

The City of Lake Stevens strives to provide accessible opportunities for individuals with disabilities. Please contact Steve Edin, City of Lake Stevens ADA Coordinator, (425) 377-3227, at least five business days prior to any City meeting or event if any accommodations are needed. For TDD users, please use the state's toll-free relay service, (800) 833-6384, and ask the operator to dial the City of Lake Stevens City Hall number.

**BLANKET VOUCHER APPROVAL
2011**

We, the undersigned Council members of the City of Lake Stevens, Snohomish County, Washington, do hereby certify that the merchandise or services hereinafter specified have been received and that the following vouchers have been approved for payment:

Payroll Direct Deposits	904185-904249	\$117,834.98
Payroll Checks	31753-31756	\$6,491.82
Claims	31757-31807	\$62,424.01
Electronic Funds Transfers	325-331	\$145,604.22
Void Checks	31711	(\$1,386.72)
Tax Deposit(s)	4/29/2011	\$42,047.64
Total Vouchers Approved:		\$373,015.95

This 9th day of May 2011:

Mayor

Councilmember

Finance Director

Councilmember

Councilmember

Councilmember



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Direct Deposit Register

28-Apr-2011

Wells Fargo - AP

Lake Stevens

Direct Deposits to Accounts

29-Apr-2011	<u>Vendor</u>	<u>Source</u>	<u>Amount</u>	<u>Draft#</u>	<u>Bank Name</u>	<u>Transit</u>	<u>Account</u>
11866	Dept. of Labor & Industries	C	\$18,711.14	325	Wells Fargo	121000248	4159656917
Total:			\$18,711.14	Count:	1.00		

Direct Deposit Summary

<i>Type</i>	<i>Count</i>	<i>Total</i>
C	1	\$18,711.14

Pre-Note Transactions

Direct Deposit Register

02-May-2011

Wells Fargo - AP

Lake Stevens

Direct Deposits to Accounts

01-May-2011	<u>Vendor</u>	<u>Source</u>	<u>Amount</u>	<u>Draft#</u>	<u>Bank Name</u>	<u>Transit</u>	<u>Account</u>
12112	AFLAC	C	\$1,777.60	326	Wells Fargo	121000248	4159656917
101	Assoc. Of Washington Cities	C	\$74,931.90	327	Wells Fargo	121000248	4159656917
9407	Department of Retirement (Pers	C	\$43,736.39	328	Wells Fargo	121000248	4159656917
9408	NATIONWIDE RETIREMENT SOL	C	\$843.72	329	Wells Fargo	121000248	4159656917
1418	Standard Insurance Company	C	\$5,201.01	330	Wells Fargo	121000248	4159656917
9405	Wash State Support Registry	C	\$402.46	331	Wells Fargo	121000248	4159656917
Total:			\$126,893.08	Count:		6.00	

Direct Deposit Summary

<i>Type</i>	<i>Count</i>	<i>Total</i>
C	6	\$126,893.08

Pre-Note Transactions

Detail Check Register

26-Apr-11

Lake Stevens

Check No	Check Date	VendorNo	Vendor	Check Amount	
31757	26-Apr-11	13782	Department of Revenue		\$1,390.57
Q1.2011		Q1.2011 Leasehold	Excise Tax	\$1,390.57	\$0.00
633013586000005		Leasehold Excise Tax Remit		\$1,390.57	
Total Of Checks:					\$1,390.57

Detail Check Register

29-Apr-11

Lake Stevens

Check No	Check Date	VendorNo	Vendor	Check Amount	
31758	29-Apr-11	13824	Wash Teamsters Welfare Trust		\$1,464.50
06/2011		Insurance Premiums		\$1,464.50	\$0.00
001010576802000		Parks - Benefits		\$58.58	
101016542002000		Street Fund - Benefits		\$702.96	
410016542402000		Storm Water - Benefits		\$702.96	
Total Of Checks:					\$1,464.50

Detail Check Register

05-May-11

Lake Stevens

Check No	Check Date	VendorNo	Vendor	Check Amount		
31759	09-May-11	13695	Aabco Barricade & Sign Co			\$2,041.68
88643			10 boxes - White Torch Down	\$2,041.68	\$0.00	\$2,041.68
101016542004800			Street Fund - Repair & Mainten	\$2,041.68		
31760	09-May-11	13328	ACES			\$679.00
8205			Safety meeting	\$679.00	\$0.00	\$679.00
001003517620000			Admin. Safety program	\$160.24		
101016517620000			safety program	\$301.48		
410016517620000			safety program	\$217.28		
31761	09-May-11	11952	Carquest Auto Parts Store			\$386.95
2421-156933			Supplies	\$47.95	\$0.00	\$47.95
101016542004800			Street Fund - Repair & Mainten	\$47.95		
2421-157142			Supplies	\$67.59	\$0.00	\$67.59
101016542004800			Street Fund - Repair & Mainten	\$67.59		
2421-157275			Supplies	\$58.60	\$0.00	\$58.60
101016542004800			Street Fund - Repair & Mainten	\$58.60		
2421-157341			Supplies	\$62.93	\$0.00	\$62.93
101016542004800			Street Fund - Repair & Mainten	\$62.93		
2421-157633			Supplies	\$67.68	\$0.00	\$67.68
101016542004800			Street Fund - Repair & Mainten	\$67.68		
2421-157731			Supplies	\$23.32	\$0.00	\$23.32
101016542004800			Street Fund - Repair & Mainten	\$23.32		
2421-157789			Supplies	\$58.88	\$0.00	\$58.88
101016542004800			Street Fund - Repair & Mainten	\$58.88		
31762	09-May-11	13550	Case Power & Equipment			\$294.41
726204			Lightbar	\$294.41	\$0.00	\$294.41
101016542004800			Street Fund - Repair & Mainten	\$294.41		
31763	09-May-11	12182	Central Welding Supply			\$1,122.58
158948			welding supplies	\$561.29	\$0.00	\$561.29
101016543504801			Street - Facilities R&M (PW)	\$561.29		
EV158948			Welding supplies	\$561.29	\$0.00	\$561.29

Detail Check Register

05-May-11

Lake Stevens

Check No	Check Date	VendorNo	Vendor	Check Amount		
101016543504801			Street - Facilities R&M (PW)	\$561.29		
31764	09-May-11	274	City of Everett	\$1,860.00		
I11001033			Animal shelter services Mar 2011	\$1,860.00	\$0.00	\$1,860.00
001008539004100			Code Enforcement - Professiona	\$1,860.00		
31765	09-May-11	13361	Clover Island Inn	\$421.10		
182799			Barnes-Boating class April 18-22	\$421.10	\$0.00	\$421.10
001008521004300			Law Enforce - Travel & Mtgs	\$421.10		
31766	09-May-11	13030	COMCAST	\$64.90		
04/11 0692756			Communications	\$64.90	\$0.00	\$64.90
001008521004200			Law Enforcement - Communicatio	\$64.90		
31767	09-May-11	13841	Comcast	\$174.80		
04/11 0630988			Communications	\$64.90	\$0.00	\$64.90
001008521004200			Law Enforcement - Communicatio	\$64.90		
04/11 0827887			Communications	\$109.90	\$0.00	\$109.90
101016542640000			Street Fund - Traffic Control	\$109.90		
31768	09-May-11	322	Concrete NorWest	\$198.99		
731016			Gravel	\$198.99	\$0.00	\$198.99
001010576803100			Parks - Operating Costs	\$100.00		
101016542003102			Street Fund Operating Costs	\$98.99		
410016542403102			Storm Water - Operating Costs	\$0.00		
31769	09-May-11	13840	Confirmdelivery.com	\$108.90		
05311765			Mail Transactions	\$108.90	\$0.00	\$108.90
001008521004200			Law Enforcement - Communicatio	\$108.90		
31770	09-May-11	91	Corporate Office Supply	\$224.95		
1164581			paper and keyboard for RC	\$63.41	\$0.00	\$63.41
001008521003100			Law Enforcement - Office Suppl	\$63.41		
1164791			Supplies	\$73.54	\$0.00	\$73.54
001013519903100			General Government - Operating	\$73.54		
1166741			Supplies	\$88.00	\$0.00	\$88.00
001008521003100			Law Enforcement - Office Suppl	\$88.00		
31771	09-May-11	349	Crossons Auto Repair	\$198.09		

Detail Check Register

05-May-11

Lake Stevens

Check No	Check Date	VendorNo	Vendor	Check Amount		
33037			break repair PW4	\$198.09	\$0.00	\$198.09
410016542404800			Storm Water - Repairs & Maint.	\$198.09		
31772	09-May-11	9386	Crystal and Sierra Springs			\$88.44
10156188041411			Bottled water	\$88.44	\$0.00	\$88.44
001008521003104			Law Enforcement-Operating Cost	\$88.44		
31773	09-May-11	13616	Diking District #2			\$19,956.00
2011			2011 Annual Payment	\$19,956.00	\$0.00	\$19,956.00
410016598501000			Diking District Contribution	\$19,956.00		
31774	09-May-11	473	Electronic Business Machines			\$381.25
064665			copier maint	\$71.40	\$0.00	\$71.40
001013519903100			General Government - Operating	\$71.40		
064862			copier maint	\$116.54	\$0.00	\$116.54
001007558003200			Planning-Operating Costs	\$58.27		
101016542003102			Street Fund Operating Costs	\$58.27		
38095A			Toner	\$193.31	\$0.00	\$193.31
001008521003100			Law Enforcement - Office Suppl	\$193.31		
31775	09-May-11	13379	Everett Safe & Lock			\$251.30
39932			repair City Hall Jail door	\$251.30	\$0.00	\$251.30
001013519904800			General Government - Repair/Ma	\$251.30		
31776	09-May-11	13764	Frontier			\$144.78
04/13/11			Communications	\$88.67	\$0.00	\$88.67
001013519904200			General Government - Communica	\$29.56		
101016542004200			Street Fund - Communications	\$29.55		
410016542404200			Storm Water - Communications	\$29.56		
04/19/11			Communications	\$56.11	\$0.00	\$56.11
001008521004200			Law Enforcement - Communicatio	\$56.11		
31777	09-May-11	13500	HB Jaeger Co LLC			\$200.61
121203/1			under ground conduit new shop	\$200.61	\$0.00	\$200.61
101016543504802			Facilities R&M (City Shop)	\$200.61		
31778	09-May-11	673	Home Depot			\$867.75
4010210			4x4 sign posts	\$1,071.27	\$0.00	\$1,071.27
101016542640000			Street Fund - Traffic Control	\$1,071.27		

Detail Check Register

05-May-11

Lake Stevens

Check No	Check Date	VendorNo	Vendor	Check Amount		
572428			smoke alarms	\$86.77	\$0.00	\$86.77
101016543504802			Facilities R&M (City Shop)	\$86.77		
9090987			Cement blocks	(\$290.29)	\$0.00	(\$290.29)
101016595616441			Main St. Emergency Repair	(\$290.29)		
31779	09-May-11	13509	Industrial Supply, Inc			\$95.78
478405			replacement rain gear	\$95.78	\$0.00	\$95.78
101016542002600			Street Fund - Clothing	\$95.78		
31780	09-May-11	13162	Jackelyn Eilert			\$171.47
1/7-3/9/11			Section 125 med reimb	\$171.47	\$0.00	\$171.47
001000281000000			Payroll Liabilities	\$171.47		
31781	09-May-11	13327	Jennifer Anderson			\$420.00
5/2-6/1/11			Dep Care Reimb	\$420.00	\$0.00	\$420.00
001000281000000			Payroll Liabilities	\$420.00		
31782	09-May-11	852	Lake Stevens Journal			\$150.75
74691			Advertising - legal	\$20.10	\$0.00	\$20.10
001013514304400			General Government - Advertisin	\$20.10		
74736			Advertising - legal	\$50.25	\$0.00	\$50.25
001007558004400			Planning - Advertising	\$50.25		
74784			Advertising - legal	\$50.25	\$0.00	\$50.25
001007558004400			Planning - Advertising	\$50.25		
74785			Advertising - legal	\$30.15	\$0.00	\$30.15
001013514304400			General Government - Advertisin	\$30.15		
31783	09-May-11	12751	LAKE STEVENS POLICE GUILD			\$850.00
05/01/11			Union Dues	\$850.00	\$0.00	\$850.00
001000281000000			Payroll Liabilities	\$850.00		
31784	09-May-11	9340	Lake Stevens School District			\$40.00
8352			Custodian Overtime Councel mtg	\$40.00	\$0.00	\$40.00
001013519903100			General Government - Operating	\$40.00		
31785	09-May-11	13755	LMN Architects			\$7,811.36
51089			Professional Services-Econ Dev	\$7,811.36	\$0.00	\$7,811.36

Detail Check Register

05-May-11

Lake Stevens

Check No	Check Date	VendorNo	Vendor	Check Amount		
001007558804111			Planning-Economic Development	\$7,811.36		
31786	09-May-11	12215	LOWES COMPANIES			\$169.00
911355			Sign posts	\$82.86	\$0.00	\$82.86
101016542640000			Street Fund - Traffic Control	\$82.86		
911789			roofing material	\$86.14	\$0.00	\$86.14
101016543504802			Facilities R&M (City Shop)	\$86.14		
31787	09-May-11	12498	MARYSVILLE PRINTING			\$104.58
9059			Supplies	\$104.58	\$0.00	\$104.58
001008521003100			Law Enforcement - Office Suppl	\$104.58		
31788	09-May-11	12684	NORTHWEST CASCADE INC.			\$920.34
1-275780			Equipment rental	\$460.17	\$0.00	\$460.17
001010574204500			Special Events - Equipt Rental	\$460.17		
1-278366			Equipment rental	\$460.17	\$0.00	\$460.17
001010574204500			Special Events - Equipt Rental	\$460.17		
31789	09-May-11	1053	Patricks Printing			\$368.44
40770			Business Cards	\$191.65	\$0.00	\$191.65
001007558003100			Planning - Office Supplies	\$191.65		
40810			1500 Window Security envelopes	\$176.79	\$0.00	\$176.79
001004514233100			Finance - Office Supplies	\$176.79		
31790	09-May-11	9333	Petty Cash Account (N. Scott)			\$413.99
4/25/11			Supplies/meeting/operations	\$413.99	\$0.00	\$413.99
001003511104905			Executive-Board Appreciation	\$101.64		
001003514103100			City Clerks-Office Supplies	\$4.32		
001003516104200			Human Resources-Communications	\$0.78		
001007558003200			Planning-Operating Costs	\$11.25		
101016542003102			Street Fund Operating Costs	\$296.00		
31791	09-May-11	1177	Puget Sound Clean Air Agency			\$1,890.50
Q2.2011			Q2.2011 Clean Air Assessment	\$1,890.50	\$0.00	\$1,890.50
001013531705100			General Government - Air Pollu	\$1,890.50		
31792	09-May-11	13304	Purchase Power			\$500.00
04/24/11			Postage	\$500.00	\$0.00	\$500.00

Detail Check Register

05-May-11

Lake Stevens

Check No	Check Date	VendorNo	Vendor	Check Amount		
001007558004200			Planning - Communication	\$44.42		
001008521004200			Law Enforcement - Communicatio	\$20.62		
001013519904200			General Government - Communica	\$421.85		
101016542004200			Street Fund - Communications	\$6.55		
410016542404200			Storm Water - Communications	\$6.56		
31793	09-May-11	13825	Raymond F Sturtz			\$574.00
LS2011-003			Professional services	\$574.00	\$0.00	\$574.00
001007558004100			Planning - Professional Servic	\$574.00		
31794	09-May-11	1273	RODDA PAINT COMPANY			\$46.24
35134523			Delta pump shield	\$23.12	\$0.00	\$23.12
101016542004800			Street Fund - Repair & Mainten	\$23.12		
35-134523			Sprayer	\$23.12	\$0.00	\$23.12
101016542004800			Street Fund - Repair & Mainten	\$23.12		
31795	09-May-11	13842	Shannon & Wilson Inc			\$4,250.00
84423			Professional services	\$4,250.00	\$0.00	\$4,250.00
101016595616440			36th Street Bridge Repair	\$4,250.00		
31796	09-May-11	1343	SIRCHIE FINGER PRINT			\$370.70
0035508-IN			DNA swabs kits	\$370.70	\$0.00	\$370.70
001008521003104			Law Enforcement-Operating Cost	\$370.70		
31797	09-May-11	1382	Snohomish County Public Works			\$1,594.36
I000270978			Repair & Maint	\$1,594.36	\$0.00	\$1,594.36
101016542004800			Street Fund - Repair & Mainten	\$1,594.36		
31798	09-May-11	12961	SNOHOMISH COUNTY PUD			\$918.50
130279927			Utilities - Electric	\$145.95	\$0.00	\$145.95
410016542404700			Storm Water-Aerat. Utilities	\$145.95		
150106796			Utilities - Electric	\$326.81	\$0.00	\$326.81
001010576804700			Parks - Utilities	\$108.94		
101016542004700			Street Fund - Utilities	\$108.94		
410016542404701			Storm Water Utilities	\$108.93		
150109108			Utilities - Electric	\$445.74	\$0.00	\$445.74
101016542630000			Street Fund - Street Lighting	\$445.74		
31799	09-May-11	13139	Steven Edin			\$399.63
04/14/11			Signs/service awards	\$399.63	\$0.00	\$399.63

Detail Check Register

05-May-11

Lake Stevens

Check No	Check Date	VendorNo	Vendor	Check Amount		
001010576803101			Parks-Eagle Ridge Pk Exp	\$8.36		
001013519903100			General Government - Operating	\$342.46		
101016542003102			Street Fund Operating Costs	\$48.81		
31800	09-May-11	11787	Teamsters Local No. 763			\$565.00
04/11			Union Dues	\$565.00	\$0.00	\$565.00
001000281000000			Payroll Liabilities	\$565.00		
31801	09-May-11	1491	The Everett Herald			\$348.20
04/22/11 20878953			Subscription to 04/20/2012	\$162.00	\$0.00	\$162.00
001013519903100			General Government - Operating	\$162.00		
1733628			Advertising - legal	\$186.20	\$0.00	\$186.20
001007558004400			Planning - Advertising	\$186.20		
31802	09-May-11	11788	United Way of Snohomish Co.			\$317.68
04/11			Employee Contributions	\$317.68	\$0.00	\$317.68
001000281000000			Payroll Liabilities	\$317.68		
31803	09-May-11	13045	UPS			\$69.39
74Y42161			evidence shipping	\$29.55	\$0.00	\$29.55
001008521004200			Law Enforcement - Communicatio	\$29.55		
74Y42171			Evidence shipping	\$39.84	\$0.00	\$39.84
001008521004200			Law Enforcement - Communicatio	\$39.84		
31804	09-May-11	12158	VERIZON NORTHWEST			\$1,953.57
0971397202			Communications	\$1,953.57	\$0.00	\$1,953.57
001003511104200			Executive - Communication	\$87.94		
001003513104200			Administration-Communications	\$84.59		
001003514104200			City Clerks-Communications	\$34.70		
001003516104200			Human Resources-Communications	\$57.48		
001003518104200			IT Dept-Communications	\$114.96		
001007558004200			Planning - Communication	\$115.26		
001008521004200			Law Enforcement - Communicatio	\$862.60		
001010576804200			Parks - Communication	\$198.68		
101016542004200			Street Fund - Communications	\$198.68		
410016542404200			Storm Water - Communications	\$198.68		
31805	09-May-11	1579	VILLAGE ACE HARDWARE			\$1,149.22
04/30/11			Supplies	\$1,149.22	\$0.00	\$1,149.22

Detail Check Register

05-May-11

Lake Stevens

Check No	Check Date	VendorNo	Vendor	Check Amount		
001008521003104			Law Enforcement-Operating Cost	\$14.65		
001008521004800			Law Enforcement - Repair & Mai	\$163.87		
001010576803100			Parks - Operating Costs	\$18.45		
001010576804800			Parks - Repair & Maintenance	\$13.02		
101016542003102			Street Fund Operating Costs	\$392.61		
101016542004800			Street Fund - Repair & Mainten	\$108.59		
101016543504802			Facilities R&M (City Shop)	\$247.21		
410016542403102			Storm Water - Operating Costs	\$135.69		
410016542404800			Storm Water - Repairs & Maint.	\$55.13		
31806	09-May-11	13843	Weinman Consulting LLC			\$3,364.76
No. 1			Professional Services	\$3,364.76	\$0.00	\$3,364.76
001007558804111			Planning-Economic Development	\$3,364.76		
31807	09-May-11	9334	WMCA			\$75.00
Norma Scott			2011 WMCA membership	\$75.00	\$0.00	\$75.00
001003514104101			City Clerks-Staff Development	\$75.00		
Total Of Checks:						\$59,568.94



LAKE STEVENS CITY COUNCIL
STAFF REPORT

Council Agenda Date: 5/9/11

Subject: Interlocal Agreement Establishing Snohomish County Drug & Gang Task Force

Contact Person/Department: Chief Randy W. Celori **Budget Impact:** \$6520.00

RECOMMENDATION(S)/ACTION REQUESTED OF COUNCIL: Rescind the approval of the Interlocal Agreement Establishing Snohomish County Drug & Gang Task Force that occurred on April 25th, 2011 and approve the revised version of the agreement.

SUMMARY/BACKGROUND: After approval of the Snohomish County Regional Drug & Gang Task Force Interlocal Agreement on April 25th, 2011 the County made some minor revision to the interlocal agreement.

The first change was a spelling correction to section 5.5 "nder" was changed to "under".

The second change was to Section 8.0. The language now reflects Snohomish County's new nondiscrimination provision, SCC 2.460

APPLICABLE CITY POLICIES:

BUDGET IMPACT: The budget impact did not change from revised version. Local match breakdowns are determined by populations of the participating jurisdictions.

2006 - \$1643 2011 – \$6520
2007 - \$2219
2008 - \$3011
2009 - \$3425
2010 - \$6152

Our 2011 Budget included \$7500 for this agreement.

ATTACHMENTS:

- Exhibit A: Interlocal Agreement Establishing Snohomish Regional Drug Task Force.

**INTERLOCAL AGREEMENT ESTABLISHING
SNOHOMISH REGIONAL DRUG & GANG TASK FORCE**

This Interlocal Agreement is among Snohomish County, a political subdivision of the State of Washington, and the following jurisdictions (hereinafter collectively referred to as the "Participating Jurisdictions"):

City of Arlington	City of Mountlake Terrace
City of Bothell	City of Mukilteo
City of Brier	City of Snohomish
City of Darrington	City of Stanwood
City of Edmonds	City of Sultan
City of Everett	DSHS, Child Protective Services
City of Gold Bar	Sauk Suiattle Tribe
City of Granite Falls	Snohomish Health District
City of Index	Stillaguamish Tribe
City of Lake Stevens	Swinomish Tribe
City of Lake Forest Park	Tulalip Tribe
City of Lynnwood	Upper Skagit Tribe
City of Marysville	Washington State Patrol
City of Monroe	

WITNESSES THAT:

WHEREAS, the State of Washington Department of Commerce (hereinafter "COMMERCE"), has received funds from the U.S. Department of Justice under authority of the Anti-Drug Abuse Act of 1988 to provide grants to local units of government for drug law enforcement; and

WHEREAS, eligible applicants include cities, counties and Indian tribes; and

WHEREAS, RCW 39.34 permits one or more public agencies to contract with any one or more other public agencies to perform any governmental service, activity, or undertaking that each public agency is authorized by law to perform; and

WHEREAS, Snohomish County and COMMERCE have entered into a Narcotics Control Grant Contract (hereinafter "Grant Contract") whereby Snohomish County shall use specified grant funds solely for a regional task force project consistent with the task force grant application submitted to COMMERCE on or before June 1, 2011, upon which the Grant Contract is based (by this reference both the Grant Contract and the grant application are incorporated in this agreement as though set forth fully herein); and

WHEREAS, the Participating Jurisdictions recognize the above-mentioned Grant Contract between COMMERCE and Snohomish County; and

WHEREAS, the Participating Jurisdictions desire to participate as members of the multi-jurisdictional task force with Snohomish County administering task force project grants on their behalf; and

WHEREAS, the Participating Jurisdictions desire to enter into an agreement with Snohomish County to enable Snohomish County to continue to be the receiver of any grant funds related to the task force project; and

WHEREAS, each of the Participating Jurisdictions represented herein is authorized to perform each service contemplated for it herein;

NOW, THEREFORE, in consideration of covenants, conditions, performances and promises hereinafter contained, the parties hereto agree as follows:

1.0 TASK FORCE CONTINUATION, TERM, AND PURPOSE

- 1.1 The countywide multi-jurisdictional task force, composed of law enforcement, prosecutor, and support personnel, known as the Snohomish Regional Drug & Gang Task Force (hereinafter "Task Force") was created pursuant to the Interlocal Agreement Among Participating Jurisdictions dated January 18, 1988. The Task Force has operated on a continuous basis since that time under a series of interlocal agreements, the most recent effective from July 1, 2010, through June 30, 2011. This agreement shall serve to continue the operation of the Task Force.
- 1.2 The effective date of this agreement shall be from July 1, 2011, through June 30, 2012, unless earlier terminated or modified as provided in this agreement.
- 1.3 The purpose of the Task Force shall be to formally structure and jointly coordinate selected law enforcement activities, resources, and functions in order to disrupt illegal drug trafficking systems and to remove traffickers through a cooperative program of investigation, prosecution, and asset forfeiture.
- 1.4 The Task Force agrees to perform the statement of work indicated in the Task Force Abstract set forth in the application for funding between COMMERCE and Snohomish County. Therefore each participating jurisdiction adopts the following Task Force goals:
 - Continue to attack the demand and supply sides of narcotics trafficking.

- Continue enforcement efforts directed toward mid and upper level dealers.
 - Continue to assist smaller agencies within Snohomish County with narcotics enforcement within their towns and cities.
 - Continue to provide narcotics enforcement training to smaller jurisdictions throughout Snohomish County.
- 1.5 The Task Force shall continue to follow a management system for the shared coordination and direction of personnel as well as financial, equipment and technical resources as stated in this agreement.
- 1.6 The Task Force shall continue to implement operations, including:
- a. Development of intelligence
 - b. Target identification
 - c. Investigation
 - d. Arrest of Suspects
 - e. Successful prosecution of offenders, and
 - f. Asset forfeiture/disposition
- 1.7 The Task Force shall evaluate and report on Task Force performance to COMMERCE as required in the Grant Contract.

2.0 ORGANIZATION

- 2.1 Exhibit "D", incorporated herein by this reference, sets forth the organization of the Task Force.
- 2.2 The Task Force Executive Board shall be comprised of the Snohomish County Prosecuting Attorney, the Snohomish County Sheriff, the Everett Police Chief, the Everett City Prosecutor, and one (1) chief of police from the remaining Participating Jurisdictions chosen by the chiefs of police of the remaining Participating Jurisdictions. The Snohomish

County Sheriff shall serve as Chair of the Executive Board. The Task Force Executive Board may adopt bylaws providing for appointment of alternates to attend Executive Board meetings in the absence of members. At such meetings the alternate shall have the same rights as the appointing member. Any action taken by the Task Force Executive Board under this agreement shall be based on a majority vote.

- 2.3 All law enforcement personnel assigned to the Task Force shall be directed in their Task Force duties by the Snohomish County Sheriff's Office (SCSO) through the Task Force Commander. The Task Force Commander will be an employee of Snohomish County for all purposes and, if not a regular SCSO deputy, will hold a special commission for that purpose.
- 2.4 Exhibit "A", incorporated herein by this reference, sets forth the personnel and related equipment and supplies currently assigned to the Task Force by each Participating Jurisdiction. Nothing in this agreement shall restrict the ability of the Snohomish County Prosecuting Attorney, Snohomish County Sheriff, Everett Police Chief, or chief law enforcement officer of any Participating Jurisdiction to reassign personnel and related equipment and supplies now or later assigned to the Task Force.

3.0 FINANCING

- 3.1 Exhibit "B" sets forth the estimated Task Force operating budget and is incorporated herein by reference. Participating Jurisdictions in the aggregate agree to provide funds that will allow for at least a one-third match of the funds awarded under the Grant Contract.

- 3.2 Exhibit "C" sets forth the Local Match breakdown for the period from July 1, 2011, to June 30, 2012, and is incorporated herein by reference. Although State and/or Federal Grant funds may vary from the amount initially requested, each Participating Jurisdiction agrees to provide funding that is no less than the amount indicated in Exhibit "C", and to pay its funding share to Snohomish County as administrator of Task Force funds promptly upon request.
- 3.3 As required by the Grant Contract, each Participating Jurisdiction agrees the funding it contributes shall be provided in addition to that currently appropriated to narcotics enforcement activities and that no Task Force activity will supplant or replace any existing narcotic enforcement activities.
- 3.4 Except as modified by section 5.3 below, all revenues collected or generated by or for the Task Force shall be forwarded to the Snohomish County Treasurer and placed in a designated special account for the purpose of supporting Task Force operations, and all real or personal property of the Task Force will be held in Snohomish County's name for the benefit of the Task Force.
- 3.5 Upon termination of the Task Force, all funds remaining in said special account shall be disbursed pro rata to the then-current Participating Jurisdictions in proportion to the percentage of their most recent financial participation as indicated in Exhibit "C".

4.0 GENERAL ADMINISTRATION

- 4.1 Snohomish County agrees to provide COMMERCE with the necessary documentation to receive grant funds.

- 4.2 By executing this agreement, each Participating Jurisdiction agrees to make any certified assurances required by the Grant Contract that are within its particular control, and agrees to make all its records related to the Task Force available for inspection consistent with the Grant Contract.
- 4.3 All Task Force contracts and agreements executed on behalf of Participating Jurisdictions under this agreement must first be approved on motion of the Task Force Executive Board. By executing this agreement, each Participating Jurisdiction agrees that, for the purpose of administering the assets and resources available to the Task Force, Snohomish County is hereby granted the authority to execute on behalf of the Participating Jurisdictions all agreements and contracts signed as approved by the Task Force Executive Board, by and through its Chair, including but not limited to all contracts for professional services. Agreements and contracts executed in this manner shall have the same legal effect as if they were executed by each Participating Jurisdiction. No such agreement or contract may impose or waive liability with respect to a Participating Jurisdiction in a manner that is inconsistent with the hold harmless provision in section 10.0 of this agreement.
- 4.4 Any dispute arising under this agreement will be forwarded to the Task Force Executive Board for arbitration. The determination made by the Executive Board shall be final and conclusive as between the parties. This provision shall not apply to issues of indemnity and liability governed by the hold harmless provision in section 10.0 of this agreement.

5.0 ASSET FORFEITURE

- 5.1 The Participating Jurisdictions shall refer all potential asset forfeitures initiated or investigated by officers assigned to the Task Force during the pendency of this agreement to the Task Force for disposition at the discretion of the Task Force Executive Board or prosecuting authority (Prosecuting Attorney or United States Attorney). Any such referred asset forfeiture that is pursued in state court will be prosecuted in the name of Snohomish County on behalf of the Task Force and its Participating Jurisdictions.
- 5.2 The Task Force Commander, under the direction of the Task Force Executive Board, shall manage the acquisition and disposition of assets seized or forfeited as a result of this agreement in compliance with law and Task Force Procedures.
- 5.3 A portion of the net monetary proceeds of each asset forfeiture made by the Task Force shall be distributed to the involved investigating agencies commensurate with their participation as determined by prior agreement between the Task Force Commander and said agencies, or in the absence of such agreement, by the Task Force Executive Board, prior to dedication of the remaining proceeds to the Task Force as specified in section 3.4. As long as the personnel, equipment, and related supply assignments stated in Exhibit "A" remain unchanged, distributions to Snohomish County and the City of Everett under this subparagraph shall be 40 percent each of the net monetary proceeds remaining after distributions under this subparagraph to Participating Jurisdictions other than Snohomish County and the City of Everett. If assignments change from those stated in Exhibit "A", the Task Force Executive Board may modify the relative percentage allocations to Snohomish County and the

City of Everett on a case-by-case or permanent basis. For purposes of this subparagraph, the term "net monetary proceeds" means cash proceeds realized from property forfeited during the term of this agreement that is not retained for use by the Task Force after deducting all costs and expenses incurred in its acquisition, including but not limited to the cost of satisfying any bona fide security interest to which the property may be subject at the time of seizure, the cost of sale in the case of sold property (including reasonable fees or commissions paid to independent selling agencies), amounts paid to satisfy a landlord's claim for damages, and the amount of proceeds (typically ten percent) payable to the State of Washington under RCW 69.50.505(9) or similar law.

- 5.4 The SRDGTF may retain funds in an amount up to \$115,000.00 from the net proceeds of vehicle seizures for the purchase of Task Force vehicles and related fleet costs.
- 5.5 Any Participating Jurisdiction receiving a distribution of assets forfeited under RCW 69.50.505 shall use such assets in accordance with RCW 69.50.505(10), which limits use to the expansion and improvement of controlled substances related law enforcement activity and prohibits use to supplant preexisting funding sources.
- 5.6 Upon termination of the Task Force, the Task Force Executive Board shall dispose of the Task Force's interest in assets seized or forfeited as a result of this agreement in accordance with applicable federal, state and county requirements, and shall distribute proceeds in accordance with sections 5.3 and 3.5.

6.0 ACQUISITION AND USE OF EQUIPMENT

- 6.1 In the event that any equipment is acquired with grant funds, the Participating Jurisdictions agree that the Task Force will use that equipment only for specified law enforcement purposes for the term of the grant.
- 6.2 Upon termination of the Task Force, any equipment provided by Participating Jurisdictions will be returned to those respective jurisdictions.
- 6.3 Upon termination of the Task Force, the Task Force Executive Board shall dispose of all acquired equipment in accordance with applicable federal, state and county requirements, and shall distribute proceeds in accordance with section 3.5.

7.0 MODIFICATION

- 7.1 Participating Jurisdictions hereto reserve the right to amend this agreement in the future from time to time as may be mutually agreed upon. No such amendment shall be effective unless written and signed by all then-contributing jurisdictions with the same formality as this agreement.

8.0 NONDISCRIMINATION PROVISION

- 8.1 The Participating Jurisdiction shall comply with the Snohomish County Human Rights Ordinance, Chapter 2.460 SCC, which is incorporated herein by this reference. Execution of this Agreement constitutes a certification by the Participating Jurisdiction of the Participating Jurisdiction's compliance with the requirements of Chapter 2.460 SCC. If the Participating Jurisdiction is found to have violated this provision,

or furnished false or misleading information in an investigation or proceeding conducted pursuant to Chapter 2.460 SCC, this Agreement may be subject to a declaration of default and termination at the County's discretion. This provision shall not affect the Participating Jurisdiction's obligations under other federal, state, or local laws against discrimination.

9.0 TERMINATION OF AGREEMENT

- 9.1 Notwithstanding any provisions of this agreement, any party may withdraw from the agreement as it pertains to them by providing written notice of such withdrawal to all other parties, specifying the effective date thereof at least thirty (30) days prior to such date. A withdrawing party may take with it any equipment it has loaned or donated to the Task Force, and shall be entitled to distributions under section 5.3 of this agreement with respect to asset forfeitures initiated before the effective date of withdrawal.
- 9.2 If there is a reduction in funds by the source of those funds, and if such funds are the basis of this agreement, Snohomish County may unilaterally terminate all or part of the agreement, or may reduce its scope of work and budget.

10.0 HOLD HARMLESS

- 10.1 Each party hereto agrees to save, indemnify, defend and hold the other parties harmless from any allegations, complaints, or claims of wrongful and/or negligent acts or omissions, by said party and/or its officers, agents, or employees to the fullest extent allowed by law. In the case of allegations, complaints, or claims against more than one party, any

damages allowed shall be levied in proportion to the percentage of fault attributable to each party, and each party shall have the right to seek contribution from each of the other parties in proportion to the percentage of fault attributable to each of the other parties. Moreover, the parties agree to cooperate and jointly defend any such matter to the extent allowed by law. An agency that has withdrawn assumes no responsibility for the actions of the remaining members arising after the date of withdrawal, but shall remain liable for claims of loss or liability arising prior to the effective date of withdrawal.

11.0 GOVERNING LAW AND VENUE

- 11.1 This agreement shall be governed by, construed, and enforced in accordance with the laws of the State of Washington without reference to choice of law principles, and venue of any suit between the parties arising out of this agreement shall be in the Superior Court of Snohomish County, Washington.

12.0 INTEGRATION

- 12.1 With the exception of necessary operational agreements between law enforcement agencies of the Participating Jurisdictions and agreements pursuant to section 5.3 hereof, this agreement constitutes the whole and entire agreement among those parties as to the Task Force and no other understandings, oral, or otherwise, regarding the Task Force shall be deemed to exist or bind the parties.

13.0 EXECUTION OF MULTIPLE ORIGINAL COUNTERPARTS

- 13.1 This agreement may be reproduced in any number of original counterparts. Each party need sign only one counterpart and when the

signature pages are all assembled with one original counterpart, that compilation constitutes a fully executed and effective agreement among all the Participating Jurisdictions. In the event that fewer than all named parties execute this agreement, the agreement, once recorded as specified in section 15.0, shall be effective as between the parties that have executed the agreement to the same extent as if no other parties had been named.

14.0 SEVERABILITY

14.1 If any part of this agreement is unenforceable for any reason the remainder of the agreement shall remain in full force and effect.

15.0 RECORDING

15.1 This Interlocal agreement will be recorded in compliance with RCW 39.34.040.

In witness whereof, the parties have executed this agreement.

SNOHOMISH COUNTY, approved at the direction of the County Council.

Aaron Reardon, County Executive

DATE: _____

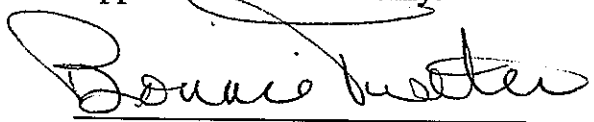
ATTEST:

APPROVAL RECOMMENDED:

John Lovick, Sheriff

DATE: _____

Approved as to form only:



Deputy Prosecuting Attorney 2467

EXHIBIT A

Snohomish Regional Drug & Gang Task Force

Personnel and Basic Equipment Assigned by Jurisdiction
July 1, 2011 through June 30, 2012

EVERETT POLICE DEPARTMENT

1 Lieutenant	<u>FUNDING</u>
1 Sergeant	Everett PD
1 Detective	Everett PD
1 Detective	Everett PD
1 Detective	Everett PD
1 Detective	Everett PD
1 Detective	Everett PD
1 Detective	Everett PD
1 Detective	Everett PD
1 Support Personnel	Everett PD

ARLINGTON POLICE DEPARTMENT

1 Detective	<u>FUNDING</u>
	Justice Assistance Grant

MARYSVILLE POLICE DEPARTMENT

1 Detective	<u>FUNDING</u>	
	Justice Assistance Grant	VACANT

BOTHELL POLICE DEPARTMENT

1 Detective	<u>FUNDING</u>
	Bothell PD

SNOHOMISH COUNTY SHERIFF'S OFFICE

1 Task Force Commander	<u>FUNDING</u>	
1 Lieutenant	Justice Assistance Grant	
1 Sergeant	Snohomish County Sheriff	
1 Sergeant	Justice Assistance Grant	
1 Detective	Snohomish County Sheriff	
1 Detective	Snohomish County Sheriff	
1 Detective	Snohomish County Sheriff	
1 Detective	Snohomish County Sheriff	
1 Detective	Snohomish County Sheriff	VACANT
1 Detective	Snohomish County Sheriff	VACANT
1 Gang Detective P/T	Snohomish County Sheriff	
1 Reserve Deputy	Snohomish County Sheriff	
1 Support Staff	Justice Assistance Grant	
1 Support Staff	Snohomish County Sheriff	

SNOHOMISH HEALTH DISTRICT

FUNDING

1 Local Health Officer

Snohomish Health District

SNOHOMISH COUNTY PROSECUTOR'S OFFICE

1 Deputy Prosecutor
1 Deputy Prosecutor
1 Support Staff
1 Deputy Prosecutor

FUNDING

Justice Assistance Grant
Snohomish County Prosecutor
Snohomish County Sheriff
Snohomish County Prosecutor

STATE OF WASHINGTON

1 Detective
1 Case Worker

FUNDING

Washington State Patrol
DSHS, Child Protective Services

WA STATE GAMBLING COMMISSION

1 Agent

FUNDING

Washington State

WASHINGTON NATIONAL GUARD

1 Intelligence Analyst

FUNDING

Washington National Guard

VACANT

BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES

0.5 Agent
0.5 Agent

FUNDING

ATF
ATF

DRUG ENFORCEMENT AGENCY

1 Agent

FUNDING

Drug Enforcement Agency

VACANT

IMMIGRATION AND CUSTOMS ENFORCEMENT

1 Agent

FUNDING

Immigration And Customs Enforcement

VACANT

NAVAL CRIMINAL INTELLIGENCE SERVICE

1 Agent

FUNDING

NCIS

EXHIBIT B

Snohomish Regional Drug & Gang Task Force

Estimated Operating Budget for July 1, 2011 through June 30, 2012

	<u>FEDERAL FUNDS</u>	<u>LOCAL MATCH</u>	<u>TOTAL</u>
Salaries	177,428	139,466	316,894
Benefits	43,636	34,300	77,936
Contracted Services	54,080	42,420	96,500
Goods and Services	0	0	0
Travel	0	0	0
Training	2,750	2,250	5,000
Equipment	0	0	0
Confidential Funds	0	0	0
TOTALS	\$277,894	\$218,436 *	\$491,759

* \$168,964 from Local Matching Funds; \$49,472 from Forfeited Assets Fund

Interlocal Agreement Establishing
Snohomish Regional Drug & Gang Task Force

EXHIBIT C

Snohomish Regional Drug & Gang Task Force

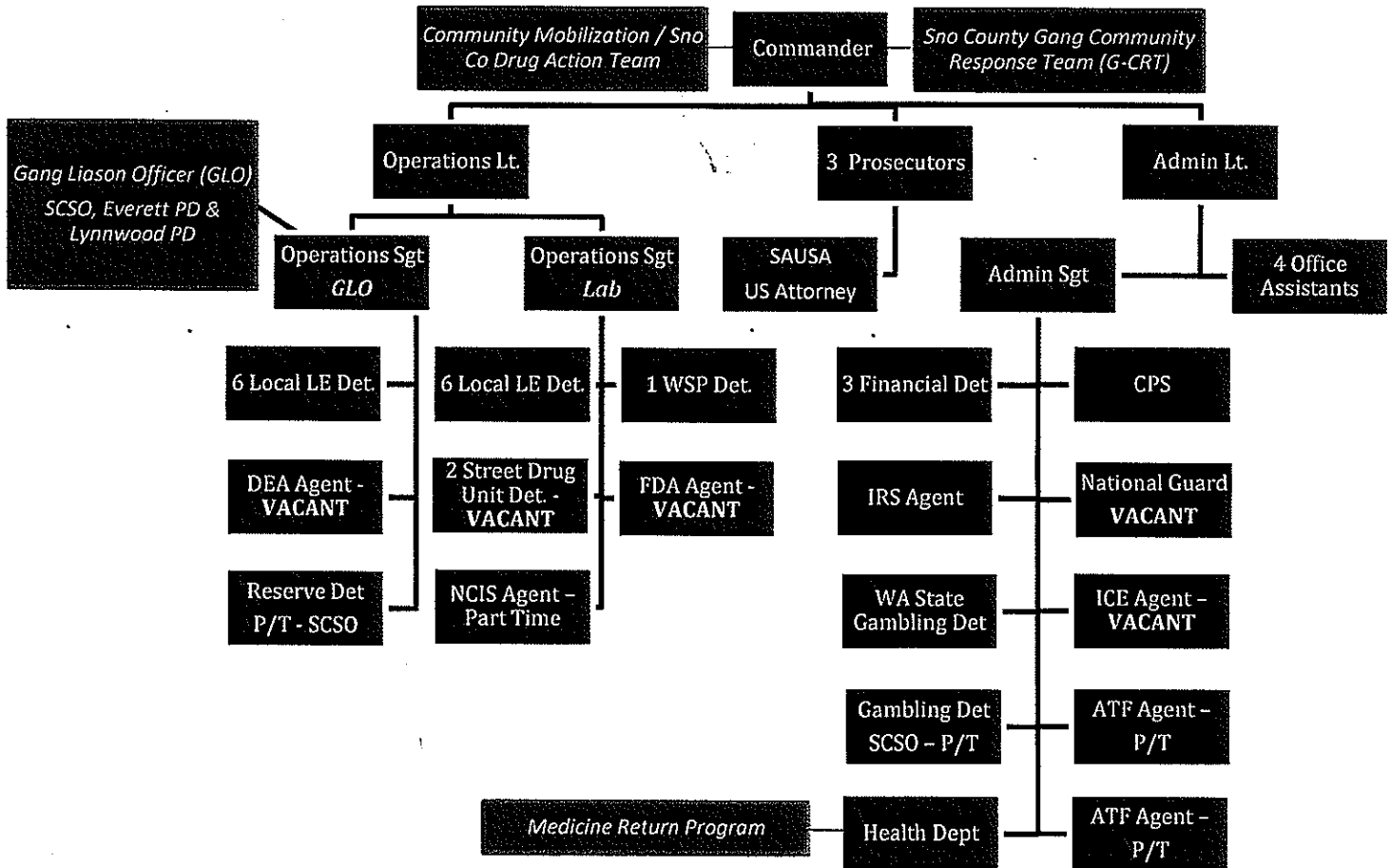
Local Match Breakdowns for July 1, 2011 through June 30, 2012

<u>JURISDICTION</u>	<u>POPULATION</u>	<u>PERCENTAGE</u>	<u>AMOUNT</u>
Arlington	17,280	2.43%	\$ 4,224.00
Bothell	16,140	2.27%	\$ 3,945.00
Brier	6,490	0.91%	\$ 1,586.00
Darrington	1,505	0.21%	\$ 368.00
Edmonds	40,900	5.75%	\$ 9,998.00
Everett	104,100	14.64%	\$ 25,447.00
GoldBar	2,175	0.47%	\$ 825.00
Granite Falls	3,375	0.48%	\$ 809.00
Index	165	0.02%	\$ 40.00
Lake Stevens	26,670	3.75%	\$ 6,520.00
Lake Forest Park	-	-	\$ -
Lynnwood	36,160	5.09%	\$ 8,839.00
Marysville	58,040	8.16%	\$ 14,188.00
Monroe	16,680	2.35%	\$ 4,077.00
Mountlake Terrace	20,960	2.95%	\$ 5,124.00
Mukilteo	20,150	2.83%	\$ 4,926.00
Snohomish	9,320	1.31%	\$ 2,278.00
Snohomish County	300,815	42.30%	\$ 73,535.00
Stanwood	5,705	0.80%	\$ 1,395.00
Sultan	4,570	0.64%	\$ 1,117.00
DSHS, CPS	-	-	\$ -
Sauk Suiattle Tribe	-	-	\$ -
Snohomish Health District	-	-	\$ -
Stillaguamish Tribe	-	-	\$ -
Swinomish Tribe	-	-	\$ -
Tulalip Tribes	-	-	\$ -
Washington State Patrol	-	-	\$ -
PARTICIPATING JURISDICTIONS' TOTALS:			\$ 168,964

EXHIBIT D

SRDGTF Executive Board

Chief of Everett (Asst Chair), Chief of Lynnwood, Snohomish County Sheriff (Chair),
Snohomish County Prosecutor, City of Everett Prosecutor, SRDGTF



ATTEST:

APPROVED AT THE DIRECTION OF THE PARTICIPATING JURISDICTION:

Title _____ Dated _____
Jurisdiction of _____

ATTEST:

Jurisdiction Clerk Dated _____

APPROVED AS TO FORM:

Jurisdiction Attorney Dated _____



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**CITY OF LAKE STEVENS
REGULAR CITY COUNCIL MEETING MINUTES**

Monday, April 25, 2011
Lake Stevens School District Educational Service Center (Admin. Bldg.)
12309 22nd Street N.E. Lake Stevens

CALL TO ORDER: 7:00 p.m. by Mayor Vern Little

COUNCILMEMBERS PRESENT: Kim Daughtry, Kathy Holder, Suzanne Quigley, and John Spencer

COUNCILMEMBERS ABSENT: Mark Somers, Marcus Tageant, and Neal Dooley

STAFF MEMBERS PRESENT: Planning Director Becky Ableman, City Administrator Jan Berg, City Attorney Cheryl Beyer, Public Works Director/City Engineer Mick Monken, Finance Director/Treasurer Barb Lowe, Human Resource Director Steve Edin, Police Chief Randy Celori, and City Clerk/Admin. Asst. Norma Scott

OTHERS: Officers Robert Summers and David Carter, Records Clerk Deb Smith, and Troy McClelland

Excused absence. Councilmember Spencer moved to excuse Councilmembers Dooley, Tageant, and Somers, seconded by Councilmember Holder; motion carried unanimously. (4-0-0-3)

Employee anniversaries. Mayor Little gave service years certificates of appreciation to Police Chief Celori for 15 years of services and Officer Robert Summers for five years.

Officer and employee of the year. Police Chief Celori noted that officer and employee of the year are selected by their peers. Officer David Carter was voted officer of the year and Records Clerk Deb Smith as employee of the year.

Guest Business. Troy McClelland, President of Economic Alliance of Snohomish County, formerly known as EDC, gave the following report: a brief history of his background, hired a consultant for benchmarking for economic development, which is a regional focus. New organization created with the first priority being industry development including transportation, rail consideration, education or incentives, and retention and expansion of companies. Second priority is economic resource development with economic advocacy and small business programs. His goal is to create the plan, line up the work plan, determine what initial goals are, and partner with the cities.

Consent Agenda. Councilmember Holder moved to approve the consent agenda (A. Approve April 2011 vouchers – Payroll Direct Deposits 904128-904184 for \$118,227.11, Payroll Checks 31681-31683, 31685 for \$8,509.38, Claims 31684, 31686-31752 for \$124,627.43, Electronic Funds Transfers 321-324 for \$6,876.92, Tax Deposit 4.15.11 for \$43,770.13 for total vouchers approved of \$302,010.97; and B. Approve minutes of April 11, 2011 regular meeting), seconded by Councilmember Spencer; motion carried unanimously. (4-0-0-3)

Approve minutes of April 18, 2011 regular meeting. Councilmember Daughtry moved to approve minutes of April 18, 2011 regular meeting, seconded by Councilmember Spencer; motion carried unanimously. (4-0-0-3)

Second and final reading of Ordinance No. 854, Waste Management Franchise

Agreement. Mayor Little stated Council needs to approve the ordinance and authorize his signature. City Administrator Berg stated this ordinance starts the clock on the seven years where the current provider continues to provide garbage service for seven years. The ordinance also enters the City into a franchise agreement. The seven years starts the clock and Waste Management requested three additional years to waive the claim for damages. After ten years the City would do a full Request for Proposals for garbage service.

MOTION: Councilmember Daughtry moved to approve second and final reading of Ordinance 854, Waste Management Franchise Agreement, seconded by Councilmember Spencer; motion carried unanimously. (4-0-0-3)

MOTION: Councilmember Spencer moved to authorize the Mayor to sign the franchise agreement with Waste Management, seconded by Councilmember Holder; motion carried unanimously. (4-0-0-3)

Award bid and approve AquaTechnex contract for Phase I Watermilfoil Control Program.

Public Works Director/Engineer Monken stated this contract implements 1st phase of the project, which is development of an application strategy plan. If Phase I is successful then Phase 2, implementation of the plan and Phase 3, follow up testing, can proceed. Phase I is only the strategy plan, which will determine the cost of the granular triclopyr treatment.

MOTION: Councilmember Spencer moved to award Phase I to AquaTechnex for the amount of \$11,500, seconded by Councilmember Daughtry; motion carried unanimously. (4-0-0-3)

Approve Narcotics Task Force Interlocal with Snohomish County. Police Chief Celori stated this is an annual agreement. The Task Force attacks mid and upper level drug dealers, provides narcotics training to the agencies and is fees based by population.

MOTION: Councilmember Holder moved to approve the Interlocal Agreement with Snohomish County Narcotics Task Force, seconded by Councilmember Spencer; motion carried unanimously. (4-0-0-3)

Approve Resolution No. 2011-6, amending the fees. Police Chief Celori reported the resolution includes a new fee for no proof of insurance, if the individual has an insurance card but not in their possession can have infraction dismissed if they show proof of insurance to the City's Traffic Violations Bureau and second fee is the sewer rate increase from \$60 to \$65.

MOTION: Councilmember Quigley moved for the fees resolution to address the Violation Bureau fee and the Sewer District rate, seconded by Councilmember Daughtry; motion carried unanimously. (4-0-0-3)

First quarter financial report. Finance Director/Treasurer Lowe reviewed the revenues and expenditures for the first quarter.

Lake Stevens City Council Regular Meeting Minutes

April 25, 2011

Council Person's Business: Councilmembers reported on the following: Spencer – attended transportation workshop; and Daughtry – PRSC transportation, SCCIT presentation on tolls, Fire District, and City transportation workshop.

Mayor's Business: Mayor Little reported on the following: transportation workshop, met with Dave Somers and County-wide planning policies on Wednesday

Staff Reports: Staff reported on the following: City Administrator Berg - 20th Street Interlocal Agreement with County was approved by City Council – looking at amending, met with Seniors to amend their agreement, receiving support from the School District for SR9 coalition, and Business Fair this past weekend; Planning Director Ableman – Business Fair, PSRC General Assembly next month, received comments back from DOE on the Shoreline Master Program, working on background data for subarea plans; and Public Works Director/Engineer Monken – have weather dependent paving projects.

Adjourn. Councilmember Holder moved to adjourn at 8:40 p.m., seconded by Councilmember Daughtry; motion carried unanimously. (4-0-0-3)

Vern Little, Mayor

Norma J. Scott, City Clerk/Admin. Asst.



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LAKE STEVENS CITY COUNCIL
STAFF REPORT

Council Agenda Date: May 9, 2011

Subject: Authorized Mayor to suspend collection of PEG fee from Comcast

Contact Person/Department: City Administrator Jan Berg **Budget Impact:** None

RECOMMENDATION(S)/ACTION REQUESTED OF COUNCIL:

Authorized the Mayor to suspend collection of PEG fee from Comcast

SUMMARY/BACKGROUND:

Currently the City receives a capital contribution of \$0.25 per subscriber per month from Comcast for capital improvements to the PEG (public, educational, governmental) channel, our Channel 21. This revenue can only be used for capital investments to the access channel. In January, 2011 the Lake Stevens City Council along with the City Councils of the consortium members authorized capital improvements to the access channel that are currently in process and the use of the capital contribution funds.

The Staff recommends that the City of Lake Stevens suspend the collection of the capital contribution until the current authorized improvements to the PEG channel are implemented and a review can be done to determine future needed improvements.

APPLICABLE CITY POLICIES:

Suspension of a fee requires City Council Approval

BUDGET IMPACT:

None

ATTACHMENTS:

► None



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LAKE STEVENS CITY COUNCIL
STAFF REPORT

Council Agenda Date: May 9, 2011

Subject: Revised Senior Center Property Use Agreement

Contact Person/Department: City Administrator Jan Berg **Budget Impact:** None

RECOMMENDATION(S)/ACTION REQUESTED OF COUNCIL:

Authorized the Mayor to sign revised Senior Center Property Use Agreement

SUMMARY/BACKGROUND:

In 2003 the City of Lake Stevens and the Lake Stevens Senior Center entered into an agreement outlining the responsibilities of each party in anticipation of applying for a Community Development Block Grant and building a Senior Center at Eagle Ridge Park. The original agreement has been revised to exclude outdated language relating to the grant application process and include the ability of the Seniors to use the detached garage for storage and occasional rummage sales to help support the operations of the Center.

APPLICABLE CITY POLICIES:

Property Use Agreements require City Council authorization prior to signing.

BUDGET IMPACT:

None

ATTACHMENTS:

- Exhibit A: Property Use Agreement

PROPERTY USE CONTRACT
Between
The City of Lake Stevens and the Lake Stevens Senior Center

This agreement is entered into by and between the City of Lake Stevens, Washington, a noncharter optional municipal code city, hereinafter referred to as "City," and the Lake Stevens Senior Center, hereinafter referred to as "LSSC" to provide for use of properties at 2302 Soper Hill Rd. hereinafter referred to as "Property."

WHEREAS, the City owns property at 2302 Soper Hill Rd., and

WHEREAS, the Seniors would benefit from use of the Property as a Senior Center; and

WHEREAS, the City would benefit from a use agreement where LSSC assume responsibility for maintenance and utilities.

NOW, THEREFORE IN CONSIDERATION OF the mutual benefits and conditions set forth below, the parties hereto agree as follows:

1. Purpose. The purpose of the Agreement is to set forth the terms whereby the City will authorize the LSSC to use the Property.
2. Definitions. For the purpose of this Agreement, the following words shall have the following meaning, unless another meaning is clearly intended:
 - A. Community Development. The Snohomish County Office of Housing and Community Development.
 - B. Grant. The Community Development Block Grant which was used to construct the Senior Center.
 - C. Property. The land and building at 2302 Soper Hill, Rd., Lake Stevens, Washington.
 - D. Garage. Enclosed detached structure located west of the Senior Center Building. Allow use by Seniors until the structure is removed by the City.
 - E. Subleasing. Renting the Property or any portion of the Property to another tenant for more than two (2) consecutive days.
 - F. Event Leasing. Renting the Property or any portion of the Property to another tenant for two (2) consecutive days or less.
3. City Responsibilities. Subject to the terms otherwise stated herein, the City agrees to the following:
 - A. Administer the Grant.

- B. Lease the Property to the LSSC for a period not to exceed 25 years beginning May, 2009 the date LSSC took possession. Provide insurance sufficient to cover the City against real property loss on the Property, not including personal property loss.
 - C. Allow the LSSC to have access to and use of the Garage until such time that the structure is removed by the City.
4. LSSC Responsibilities. LSSC agrees to the following:
- A. Abide by all terms and conditions required by the Grant, including allowing the City to access the LSSC's financial and other records in order to ensure grant compliance.
 - B. At their own expense and at all times, keep the premises neat, clean and in a sanitary condition, and keep the Property in accordance with all applicable laws, ordinances, rules, regulations and requirements of the City of Lake Stevens, the State of Washington and United States Government.
 - C. Not cause or permit waste, damage or injury to the premises. Keep all drain pipes free and open, protect water, heating, gas and other pipes to prevent freezing or clogging, repair all leaks and damage caused by leaks, replace all glass in windows and doors in the premises which may become cracked or broken, and shall make all such repairs as necessary to maintain the premises in as good condition as at the time of taking possession.
 - D. Pay all charges for phone, heat, electricity, water, septic, garbage, drainage and all other public utilities and insurance when due.
 - E. Maintain for the duration of this agreement, insurance against claims for injuries to persons or damage to the Property which may arise from or in connection with the LSSC's use of the Property.

Commercial General Liability insurance shall be written on Insurance Services Office (ISO) occurrence form C G 00 01 and shall cover premises and contractual liability. The City shall be named as insured on the LSSC's Commercial General Liability Insurance policy using ISO Additional Insured Managers or Lessors of Premises Form CG 20 11 or a substitute endorsement providing equivalent coverage. Property insurance shall be written on an all-risk basis.

Commercial General Liability insurance shall be written with limits no less than \$1,000,000 each occurrence, \$2,000,000 general aggregate. The LSSC's insurance coverage shall be primary insurance as respects the City. Any insurance, self-insurance, or insurance pool coverage maintained by the City shall be excess of the Lessee's insurance and shall not contribute with it.

The LSSC's insurance shall be endorsed to state that coverage shall not be cancelled, except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given to the City.

Insurance is to be placed with insurers with a current A.M. Best rating of not less than AVII.

The LSSC shall furnish the City with original certificates and a copy of the amendatory endorsements, including but not necessarily limited to the additional insured endorsement, evidencing the insurance requirements of the Lessee.

The LSSC and City hereby release and discharge each other from all claims, losses and liabilities arising from or caused by any hazard covered by property insurance on or in connection with the premises of said building. This release shall apply only to the extent that such claim, loss or liability is covered by insurance.

F. Use and manage the Property exclusively as a Senior Center, in accordance with Grant requirements established by Community Development.

G. Cooperate and communicate proactively with the City and other users of neighboring lands and properties to establish and maintain effective and positive working relations with the City, other park property users and neighborhood residents.

This includes but is not limited to use of the Property as an access way to Eagle Ridge Park, use of the neighboring lands for sports fields and other uses which the City deems to meet the intended parks and recreation purpose of the Property.

H. Allow the City access to inspect the facility.

I. Prevent outside activities from dusk to dawn in accordance with Lake Stevens City Code 10.30.050.

J. Smoking or use of tobacco products shall not be allowed on the property as permitted in public places by local regulations and State Law, whichever is more restrictive.

K. LSSC shall reserve three parking spaces allowing Eagle Ridge Park users to park.

5. Termination. The City reserves the right to terminate this agreement if the LSSC violate any of their responsibilities as defined herein, thirty (30) days following written notice of the violation. The LSSC reserve the right to terminate this agreement if the City violates any of their responsibilities as defined herein, thirty (30) days following written notice of the violation.

6. Contingencies. This agreement is subject to the following:
 - A. The Declaration of Covenant between the City and Snohomish County, which obliges the City to use the Property for parks and recreation purposes. This Covenant is attached and labeled **Exhibit A**.
7. Consideration. In exchange for use of the Property, subject to all the terms described herein, the LSSC agree to pay the City one (1) dollar per year, for the duration of this agreement.
8. Duration of Agreement. This Agreement shall be in full force and effect commencing on the effective date of the agreement until one of the following occurs.
 - A. Contract termination.
 - B. Twenty-five (25) years from May, 2009 which is the date that the LSSC first occupy the Property.
9. Subleasing. The LSSC shall not sublease the Property to any party not qualified under the Grant, and without the express written permission of the City.
10. Event Leasing. The LSSC may rent the property or portions of the Property for Event Leasing purpose subject to the following restrictions:
 - A. LSSC shall ensure that event lessors provide proof of insurance naming the City as an additional insured, according to standards established by the City.
 - B. LSSC shall ensure that event lessors abide by the same conditions and restrictions as LSSC, as defined herein.
11. Alterations to the Property.
 - A. The City shall retain final authority over improvements to the Property both before and after granting possession to the LSSC. Authority to make alterations sufficient to establish a Senior Center shall not be unreasonably withheld.
 - B. Other than normal maintenance, the LSSC shall make no alterations to the Property without the express written permission of the City. If alterations other than normal maintenance are authorized, the LSSC shall secure all required permits prior to commencing work.
12. Entire Agreement. This Agreement, including **Exhibit A**, contains the entire agreement between the parties hereto, and no other agreements, oral or otherwise, regarding the subject matter of Agreement shall be deemed to exist or bind any of the parties hereto. Either party may request changes to the Agreement. Proposed changes, which are mutually agreed upon, shall be incorporated by written amendments to this Agreement.

13. Hold Harmless. LSSC shall defend, indemnify, and hold harmless the City, its officers, officials, employees, and volunteers, from and against all claims, suits, actions or liabilities for injury or death of any person, or for loss or damage to property, which arises out of LSSC's use of the Property, or from the conduct of LSSC's business, or from any activity, work or thing done, permitted, or suffered by LSSC in or about the Premises, except only such injury or damage as shall have been occasioned by the sole negligence of the City.
14. Communications. Notices to and communications with the City of Lake Stevens shall be sent to the following:

City Administrator
City of Lake Stevens
P.O. Box 257
Lake Stevens, WA 98258
425-334-1012

President
Lake Stevens Senior Center
2302 Soper Hill Road
Lake Stevens, WA 98258

15. Applicable law, Venue, Attorney's Fees. This Agreement shall be governed by and construed in accordance with the laws of the State of Washington. In the event any suit, arbitration, or other proceeding is instituted to enforce any term of this Agreement, the parties specifically understand and agree that venue shall be exclusively in Snohomish County, Washington. The prevailing party in any such action shall be entitled to its attorneys' fees and costs of suit.
16. Severability. In the event that any section, paragraph, sentence, clause, or phrase is determined to be invalid in a court of law, such determination shall not affect any of the remaining sections, paragraphs, sentences, clauses or phrases of this agreement.
17. Destruction of the Property. If, for any reason, the leased property is destroyed or otherwise becomes untenable in whole or in part by fire, the elements or other casualty, the City may elect, at its option, not to restore or rebuild the leased property, in which event LSSC shall be notified and shall vacate the premises and the lease shall be terminated.

DATED this _____ day of _____, 2011.

CITY OF LAKE STEVENS

LAKE STEVENS SENIOR CENTER

Vern Little, Mayor

President

APPROVED AS TO FORM:

Grant K. Weed, City Attorney

Exhibit "A"

AFTER RECORDING RETURN TO:

Snohomish County Parks and Recreation
9623 - 32nd St. SE
Everett, WA 98205

CONFORMED COPY
200307140798 3 PGS
07-14-2003 02:10pm \$0.00
SNOHOMISH COUNTY, WASHINGTON

COPY

DECLARATION OF COVENANT

Grantor: City of Lake Stevens

Grantee: Snohomish County, on behalf of itself and the public

Legal Description: See Exhibit A

Assessor's Property Tax Parcel Account Number: 006049049-000-004-00

Reference numbers of related/assigned/released/documents:

The Grantor, City of Lake Stevens, a municipal corporation of the State of Washington, for and in consideration of moneys obtained in whole or in part from Snohomish County as part of its Neighborhood Improvement Program, and in fulfillment of the terms of that certain Neighborhood Improvement Program Interlocal Agreement dated July 2, 2003, made by and between Grantor and Snohomish County and recorded at Auditor's File No. 200307140796, records of Snohomish County, hereby declares this covenant and places the same on record.

Grantor is the owner in fee simple of the following described real estate situated in Snohomish County, State of Washington, to wit:

See Exhibit A, attached hereto and incorporated herein by reference.

Grantor hereby declares that all of the real property described above shall be held, sold and conveyed subject to the following restrictions, covenants and conditions, which shall inure to the benefit of Snohomish County on behalf of itself and the public, and shall burden the real property described above, and shall pass with the property and each and every lot thereof, and shall apply to and bind the owners of the property and owners of each lot thereof, their legal representatives, grantees, heirs, successors and assigns in perpetuity unless terminated in accordance with the terms of the Interlocal Agreement described above.

GRANTOR AGREES AND COVENANTS that Grantor, its successors and assigns shall construct maintain and operate a park and recreational facility for public use on the above real property.

This covenant shall run with the land and shall be binding on all parties having or acquiring any right, title, or interest in the land described herein or any part thereof; PROVIDED, however, that the restrictions, covenants and conditions provided for in this covenant shall not pass with the property in the event the property is conveyed to Gordon Foster under exercise of his right of first refusal to purchase the property, as referenced in the Quitclaim Deed and Agreement under which the City of Lake Stevens accepted the property

GRANTOR:

By: Lynn E. Walby
Title: Mayor
Date: 5-28-2003

STATE OF WASHINGTON)
) ss.
COUNTY OF SNOHOMISH)

I certify that I know or have satisfactory evidence that Lynn E. Walby
_____ is the person who appeared before me, and said person
acknowledged that he/she signed this instrument, on oath stated that he/she was
authorized to execute the instrument and acknowledged it as the Mayor
_____ of the City of Lake Stevens, to be the free and voluntary act of such party for
the uses and purposes mentioned in the instrument.

Dated: 5/28/03

Diana E. Bennett
Printed: Diana E. Bennett
NOTARY PUBLIC in and for Washington
My commission expires: 08-19-06

DIANA E. BENNETT
NOTARY PUBLIC
STATE OF WASHINGTON
COMMISSION EXPIRES
AUGUST 19, 2006

EXHIBIT "A"

PARCEL A:

That portion of Lot(s) 4, VERNON PARK, according to the plat thereof recorded in Volume 9 of Plats, page(s) 62, records of Snohomish County, Washington, described as follows:

Beginning at the most Westerly corner of said Lot;
THENCE North 59°26'20" East along the North line of said Lot a distance of 773.15 feet to the most Northeasterly corner of said Lot;
THENCE South 30°03'30" East along the East line of said Lot a distance of 150 feet;
THENCE South 59°26'20" West parallel to the North line of said Lot to the Westerly line of said Lot;
THENCE North 61°27'38" West along said Westerly line to the Point of Beginning;
EXCEPT the Northeasterly 10 feet as conveyed to County for road under Recording No. 7603220248;

PARCEL B:

Lot(s) 4, VERNON PARK, according to the plat thereof recorded in Volume 9 of Plats, page(s) 62, records of Snohomish County, Washington;
EXCEPT that portion described as follows:

Beginning at the most Westerly corner of said Lot;
THENCE North 59°26'20" East along the North line of said Lot a distance of 773.15 feet to the most Northeasterly corner of said Lot;
THENCE South 30°03'30" East along the East line of said Lot a distance of 150 feet;
THENCE South 59°26'20" West parallel to the North line of said Lot to the Westerly line of said Lot;
THENCE North 61°27'38" West along said Westerly line to the Point of Beginning;

AND EXCEPT the Northeasterly 10 feet as conveyed to County for road under Recording No. 7603220248

SITUATE in the County of Snohomish, State of Washington.

ABBREVIATED LEGAL

Lot(s) 4, VERNON PARK, Volume 9 of Plats, page(s) 62.

Tax Account No. 006049-000-004-00

END OF EXHIBIT "A"



LAKE STEVENS CITY COUNCIL
STAFF REPORT

Council Agenda Date: 9 May 2011

Subject: Amendment No. 2 to County Interlocal Agreement for Surface Water Management Services

Contact	Mick Monken	Budget Impact:	Revenue
Person/Department:	Public Works		

RECOMMENDATION(S)/ACTION REQUESTED OF COUNCIL: Approve an amendment to the existing County Interlocal Agreement (ILA) for Surface Water Management Services, obligating Snohomish County to contribute a share to the cost to implement the Eurasian Watermilfoil removal through 2020.

SUMMARY/BACKGROUND: The City and County both have jurisdictional frontage abutting Lake Stevens. In 2010, the two agencies worked together in the preparation of an Integrate Aquatic Vegetation Management Plan (aka: LAVMP or aquatic plant control plan) that identified Eurasian Watermilfoil as a problematic aquatic weed and developed a preliminary plan for the long range removal of this weed from Lake Stevens. This plan was adopted by Washington State Department of Ecology (DOE) in January 2011.

The estimated cost for the milfoil removal implementation in 2011, per the 2010 aquatic plant control plan, is \$171,000. (This actual cost will be determined with the 2011 implementation strategy plan current being developed by AquaTechnex.) In late 2010, the City sought and received a grant from DOE for \$75,000 to be used for the implementation of the plan. This left a balance \$96,000 to be funded by the two agencies. It was mutually agreed that the County's share would be 20% of the total cost. This was determined based on the percentage of jurisdictional frontage.

As this is an ongoing program that could take several years for the milfoil removal treatment, the ILA covers an obligation to the County through 2020. There is a reduction adjustment formula for the County's match rate in the event that the City annexes a portion of their jurisdictional frontage.

APPLICABLE CITY POLICIES: To protect the quality of Lake Stevens

BUDGET IMPACT: This would be a revenue source to the City up to \$20,000 (20% actual costs). This amount could be increased to cover additional implementation costs with prior approval from the County.

ATTACHMENTS:

- ▶ Exhibit A: Amendment No. 2 to County ILA for Surface Water Management Services
- ▶ Exhibit B: Integrate Aquatic Vegetation Management Plan – January 2011

EXHIBIT A

AFTER RECORDING RETURN TO

Snohomish County Council
Attention: Clerk of the Council
3000 Rockefeller Ave, M/S 609
Everett, WA 98201

**SECOND AMENDMENT
TO
INTERLOCAL AGREEMENT FOR
SURFACE WATER MANAGEMENT SERVICES
BY AND BETWEEN
Snohomish County and the City of Lake Stevens**

THIS SECOND AMENDMENT TO INTERLOCAL AGREEMENT FOR SURFACE WATER MANAGEMENT SERVICES BY AND BETWEEN SNOHOMISH COUNTY AND THE CITY OF LAKE STEVENS (this "Amendment") is made and entered into this _____ day of _____, 2011, by and between Snohomish County, a political subdivision of the State of Washington (hereinafter referred to as the "County"), and the City of Lake Stevens, a Washington municipal corporation (hereinafter referred to as the "City").

RECITALS

WHEREAS, the County and the City are the parties to that certain INTERLOCAL AGREEMENT FOR SURFACE WATER MANAGEMENT SERVICES BY AND BETWEEN SNOHOMISH COUNTY AND THE CITY OF LAKE STEVENS dated April 27, 2007 (the "Original Agreement"), a true and correct copy of which is attached as Exhibit 1, for the purpose of maintaining the hypolimnetic aeration system, monitoring lake water quality, and providing other surface water management services; and

WHEREAS, the County and the City are the parties to that certain FIRST AMENDMENT TO INTERLOCAL AGREEMENT FOR SURFACE WATER MANAGEMENT SERVICES BY AND BETWEEN SNOHOMISH COUNTY AND THE CITY OF LAKE STEVENS dated December 2, 2009 ("First Amendment"), a true and correct copy of which is attached as Exhibit 2; and

WHEREAS, major portions of Lake Stevens are currently infested with Eurasian watermilfoil, a non-native invasive aquatic plant, and long term control of this and other

potential invasive aquatic plants is important to protect public use and enjoyment of the lake and to prevent the spread of invasive plants into other portions of the lake; and

WHEREAS, the City, with County assistance, has developed an Integrated Aquatic Plant Control Plan, dated January 2011, setting forth recommended measures to eradicate Eurasian watermilfoil from Lake Stevens; and

WHEREAS, portions of the shoreline of Lake Stevens lie within the jurisdiction of the City and the County, and both jurisdictions operate public access sites on the lake; and

WHEREAS, the Original Agreement permits amendments thereto as described in Section XII of the Original Agreement; and,

WHEREAS, the County and the City would benefit from amending the Original Agreement to implement the Integrated Aquatic Plant Control Plan to control and monitor invasive aquatic plants in Lake Stevens;

AGREEMENT

NOW, THEREFORE, in consideration of the covenants hereinafter set forth and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the County and the City agree as follows:

1. Amendment

Section VIII, INVASIVE AQUATIC PLANT MANAGEMENT, of the Original Agreement dated April 27, 2007, is amended to read as follows:

A. Implementation Responsibility - The City shall be responsible for implementing the Integrated Aquatic Plant Control Plan, dated January 2011, incorporated herein by this reference, to eradicate Eurasian watermilfoil from Lake Stevens, provided that the City shall coordinate with the County on implementation activities and expenses and shall consider recommendations from the County. The City shall have the authority to contract, at its discretion and under its sole control and responsibility, with outside parties to perform aquatic plant management implementation activities. The City may request that the County perform specific implementation activities.

B. Cost Sharing - The County shall be obligated to pay twenty percent (20%) of the total costs incurred by both the City and the County for implementing the Integrated Aquatic Plant Control Plan, up to a maximum of \$20,000 in 2011, \$17,400 in 2012, \$11,200 per year in 2013 and 2014, and \$11,000 per year from 2015 through 2020. The City shall be obligated to pay eighty percent (80%) of the

costs incurred by both the City and the County. The County shall also pay twenty percent (20%) of any additional costs for implementation in excess of the amounts set forth above, provided that such additional costs are pre-approved by the County. Such pre-approval may be withheld for any reason including, but not limited to, the County's availability of funds. Additional costs may include higher than anticipated treatment costs, greater acreage of treatment, the need for more frequent or different treatment measures, and other contingencies. Both the County and the City shall document and report to the other jurisdiction on a quarterly basis all aquatic plant management expenses that have been incurred.

C. Annexation Adjustments - If the City annexes additional properties on the Lake Stevens lake front after January 1, 2011, the County's obligations for aquatic plant management implementation costs described in subsection VIII B shall be reduced by one percent (1%) and the City's obligations increased by one percent (1%) for each three hundred seventy (370) feet of lake front annexed by the City. However, in recognition of the regional benefits of Lake Stevens, the County's share of aquatic plant management costs shall not be reduced to less than ten percent (10%) by annexation adjustments. Reductions in the County's obligations shall become effective on January 1st of the year after annexation is finalized.

2. Ratification

Except as modified by this Amendment and the First Amendment, the Original Agreement shall remain in force and effect in accordance with its terms and is hereby ratified and affirmed.

3. Execution in Counterparts: Exchange of Facsimilie Signatures

This Amendment may be executed in counterparts, each of which shall be an original and all of which shall together constitute one and the same instrument.

[The remainder of this page is intentionally left blank.]

IN WITNESS WHEREOF the parties hereto have executed this Amendment as of
the date first above written.

THE COUNTY:

Snohomish County, a political subdivision
of the State of Washington

By _____

Name: _____

Title: _____

Approved as to Form:

Deputy Prosecuting Attorney

THE CITY:

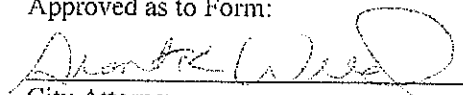
The City of Lake Stevens, a Washington
municipal corporation

By _____

Name: _____

Title: _____

Approved as to Form:



City Attorney

Exhibit "1"

AFTER RECORDING RETURN TO

Snohomish County Council
Attention: Barb Sikorski
3000 Rockefeller Ave, M/S 609
Everett, WA 98201

CONFORMED COPY
200705080356 13 PGS
05/08/2007 10:03am \$0.00
SNOHOMISH COUNTY, WASHINGTON

**INTERLOCAL AGREEMENT
FOR SURFACE WATER MANAGEMENT SERVICES
BY AND BETWEEN
Snohomish County and the City of Lake Stevens**

THIS AGREEMENT is made and entered into this 27 day of April, 2007, by and between Snohomish County (hereinafter referred to as the "County") and the City of Lake Stevens (hereinafter referred to as the "City").

WHEREAS, the Interlocal Cooperation Act, Chapter 39.34 Revised Code Washington, permits local governmental units to make the most efficient use of their powers by enabling them to cooperate with other localities on the basis of mutual advantage; and,

WHEREAS, the County and the City have entered into prior interlocal agreements for constructing, operating, and maintaining the hypolimnetic aeration system and for design, construction, monitoring, and maintenance of the Lundeen Creek Restoration Project; and

WHEREAS, the Lake Stevens urban growth area includes lands within unincorporated Snohomish County surrounding the corporate limits of the City and covers portions of the watershed of Lake Stevens and the watersheds draining to Ebey Slough and Little Pilchuck Creek; and

WHEREAS, the County currently provides surface water management services within much of the Lake Stevens urban growth area; and

WHEREAS, the City has recently annexed portions of the Lake Stevens urban growth area and is in the process of annexing additional portions of the urban growth area; and

WHEREAS, annexations result in shifts of jurisdiction and revenue from the County to the City, but do not change watersheds or drainage features or the need for surface water management services; and

WHEREAS, Drainage Improvement District No.8, which has provided some surface water management services within the unincorporated portion of the urban growth area, suspended operations and assessments on December 31, 2006; and

WHEREAS, there is an on-going need to provide effective surface water management services in both unincorporated areas and within the city limits; and

WHEREAS, competent operation and regular maintenance of the aeration system and storm drainage facilities, as well as stream and lake monitoring, are necessary to protect the water quality of Lake Stevens and area streams and to minimize flooding and drainage problems, and

WHEREAS, the County and the City would benefit from continued cooperation in operating and maintaining the hypolimnetic aeration system and from coordinated provision of other surface water management services; and

WHEREAS, the County and the City have determined that the benefits received from cooperation will equal or exceed the costs to each jurisdiction associated with the provisions of this agreement;

NOW, THEREFORE, IT IS MUTUALLY AGREED AS FOLLOWS:

I. GOAL AND OBJECTIVES OF AGREEMENT

The goal of this agreement is to provide effective surface water management services at a reasonable cost to residents and property owners in the Lake Stevens UGA during and after the period of transition from unincorporated County jurisdiction to City jurisdiction.

The objectives of this agreement are to:

- provide for seamless delivery of surface water management services as annexations occur and responsibility moves from the County to the City;
- utilize the County's skilled expertise in providing surface water management services in the Lake Stevens urban growth area;
- continue cooperation in operating and maintaining the hypolimnetic aeration system;
- provide for maintenance of drainage infrastructure;
- provide a mechanism for transfer of long-term funding of capital projects from the County to the City as annexations occur;
- promote efficiencies in compliance with NPDES stormwater permits;
- enhance surface water management services by jointly promoting Low Impact Development standards and other sustainability initiatives and regulations;
- promote surface water management utility service charge structures that impose charges on developed properties that are consistent with the benefits received and/or the impacts created;

- provide for fair recovery of costs by either the County or the City for services performed within the other's jurisdiction;
- account for regional service expenditures by the County that benefit the City; and
- foster cooperation between the County and the City to protect lake and stream water quality, address flooding and drainage problems, and enhance aquatic habitat.

II. DEFINITIONS

As used in this agreement, terms have the following meaning:

"Aerator operation and maintenance" or "Aerator O/M" means operation, inspection, major and minor repair, parts replacement or overhaul, lubrication, operating adjustment, cleaning, landscaping maintenance, utility payment, rentals, leases, insurance, and purchase of equipment and materials, as necessary for the proper operation and maintenance of the hypolimnetic aeration system.

"Hypolimnetic aeration system" means the system of lake aerators, pipes, air compressor, compressor building, and other equipment intended to supply oxygen to the bottom waters of Lake Stevens without inducing mixing of the surface and bottom waters. "Hypolimnion" means the lower region of the lake near the sediment surface.

"Lake Stevens urban growth area" or "Lake Stevens UGA" means the geographic area surrounding the City of Lake Stevens that has been designated by Snohomish County for future urban growth and development pursuant to the Growth Management Act, RCW 36.70A.

"Monitoring" means collecting, analyzing, and reporting water quality and water quantity conditions in Lake Stevens and area streams in support of water quality protection and effective storm drainage.

"NPDES Permit" means the National Pollutant Discharge Elimination System municipal stormwater permit issued under the federal Clean Water Act that requires a municipality to prevent or minimize stormwater pollution discharges from its storm sewer systems by means of local stormwater regulations and operational programs.

"Operations/Maintenance Advisory Team" means the technical advisory team representing the County and the City, described in Section III.C of this agreement.

"Repair" means that aspect of aerator O/M involving restoration of the air compressor, piping, aerators, and other components of the hypolimnetic aeration system to a sound working condition after damage or wear and tear. A major repair is one which costs in excess of \$10,000 in labor and materials. A minor repair is one which costs less than \$10,000 in labor and materials.

"Replacement or overhaul" means that aspect of aerator O/M involving the replacement or major renovation of the air compressor, piping, aerators, and other structural components of the hypolimnetic aeration system after the end of their useful lives.

"Surface water management services" means services that include the following tasks: plan, design, regulate, establish, acquire, develop, construct, maintain, and improve stormwater control facilities and water pollution control facilities, as well as activities to inventory, rehabilitate, and restore drainage systems; investigate and address drainage and water quality problems; collect and analyze stream and lake water quantity and water quality data; develop management plans; provide public involvement and education; and promote residential, commercial, and agricultural best management practices.

III. HYPOLIMNETIC AERATION SYSTEM

A. Ownership and O/M Responsibility – The City is the legal owner of the hypolimnetic aeration system. The City shall be responsible for performing O/M of the hypolimnetic aeration system, including minor repairs, in accordance with the O/M manual prepared for the City and approved by the Washington State Department of Ecology. The City shall consider the recommendations of the County through the Operations/Maintenance Advisory Team regarding operation and maintenance. The City shall have the authority to contract, at its discretion, with the County, or an outside party, or with both the County and outside party, to perform any or all of the O/M. The City shall also be responsible for securing and maintaining liability and comprehensive insurance for the aeration system.

B. Equipment Replacement or Major Repair – The air compressor and other structural components of the hypolimnetic aeration system shall be replaced or overhauled at the end of the useful lives for each component. The useful life of the compressor is anticipated to be fifteen (15) years. In addition, structural, mechanical, and electrical components of the system may need major repair in the event of breakage, failure, or premature wear and tear. Based on the recommendations of the Operations/Management Advisory Team, the City shall determine the necessity and timing of equipment replacement, overhauls, or major repairs. The Advisory Team shall also recommend the appropriate agency to manage such work, on a case-by-case basis.

C. Operations/Maintenance Advisory Team – An operations/maintenance advisory team shall be maintained for the duration of this agreement. The team shall consist of two representatives each from the County and the City. The team shall meet every three months, or more frequently at the request of any of the team members. The responsibilities and powers of the team shall be to advise the City on the timing and nature of O/M activities, equipment replacement, and major repairs for the hypolimnetic aeration system and to approve a lake monitoring program and budget.

D. Aerator Cost Sharing –

1. Beginning in 2007, the County shall be obligated to pay forty percent (40%) of the total costs of O/M and equipment replacement or major repairs for the hypolimnetic aeration system incurred by the City or the County, up to a maximum of \$27,000 per year, subject to the provisions described below.

2. The County shall also be obligated to pay forty percent (40%) of additional aeration O/M and equipment replacement or major repair costs in excess of \$27,000 per year, provided that such additional costs are pre-approved by the County. Such pre-approval may be withheld for factors which include, but are not limited to, the County's availability of funds through taxes and/or rates and charges. Additional costs may include higher than anticipated utility costs, longer periods of operation, unexpected or emergency repairs, the need for more frequent or more complicated maintenance, and other contingencies.

3. In order to accumulate funds for equipment replacement and major repairs, the County and the City shall deposit \$16,000 and \$24,000 per year, respectively, into an equipment replacement and major repair reserve fund. Deposits into this account shall be due and payable by January 31st of each year. The City shall maintain the reserve fund and shall invest monies in this account in the normal manner of investing reserve accounts, and all interest accrued shall remain in this account. Expenditures for equipment replacement or major repairs from this fund shall be pre-approved by both the County and the City. However, lack of pre-approval by the County shall not prevent the City from using other City funds to perform equipment replacement or major repairs that it deems necessary. Should the County and the City by mutual agreement decide that aeration is no longer needed, the City shall distribute all funds including interest in this account to the respective parties, in proportion to their contributions, within 90 days of such decision.

4. The City shall be responsible for maintaining accurate records of all O/M, equipment replacement, and major repair expenses. The County shall document and report to the City any O/M expenses it has incurred. The City shall then combine the expense records and prepare billings to the County for its share of the total O/M and equipment replacement or major repair costs incurred by either party, up to the limit set forth above, and for any additional costs pre-approved by the County. The City shall also bill annually for the equipment replacement and major repair reserve fund deposits.

5. The obligations under this agreement for aerator O/M, equipment replacement, and major repairs shall be adjusted if, after

January 1, 2007, the City annexes additional properties. For each seventy (70) acres of property located within the Lake Stevens watershed annexed by the City, the County's obligations for O/M, equipment replacement, or major repair costs shall be reduced by one percent (1%) of the total. In addition, for each one-hundred (100) acres of property located within the Lake Stevens urban growth area but outside the Lake Stevens watershed annexed by the City, the County's obligations for aerator O/M, equipment replacement, and major repair shall be reduced by one percent (1%) of the total. The exact percentage adjustment (calculated to one-tenth percent (0.1%)) shall be determined by dividing the number of acres annexed by seventy (70) or one-hundred (100), respectively. Reductions in the County's obligations shall become effective on January 1st of the year after each annexation is finalized. All aerator obligations removed from the County by virtue of annexation shall be assumed by the City. However, in recognition of the regional benefits of the Lake Stevens aeration system, the County's share of O/M, equipment replacement, or major repair costs shall not be reduced to less than ten percent (10%) by annexation adjustments. These cost sharing provisions shall be re-negotiated if any other local jurisdiction annexes property within the Lake Stevens watershed. The County shall maintain an ongoing record of annexations and the resultant shifts in obligations and shall provide such record to the City.

IV. MONITORING

A. Water Quality Monitoring -- Beginning in 2007, the County shall assume responsibility for conducting water quality monitoring that was previously performed by Drainage Improvement District No. 8. This includes water quality monitoring of Lake Stevens and tributary streams. By January 31, 2007, the County shall present a proposed 2007 monitoring plan to the City for approval. This plan shall include monitoring parameters, frequencies, and stations. Any changes proposed in the monitoring plan for subsequent years shall be submitted to the City for approval prior to implementation. The City shall be obligated to reimburse the County for sixty percent (60%) of the monitoring costs incurred by the County up to a maximum of \$12,000 per year. If the City annexes additional properties after January 1, 2007, the City's obligations for monitoring costs shall be adjusted in the same manner as set forth in Section III.D.5 for aerator cost sharing.

B. Water Quantity Monitoring -- The County shall take responsibility for water quantity (stage/flow) monitoring of the stream gage at Catherine Creek at 20th Street. If requested by the City, the County shall also take responsibility for water quantity (stage/flow) monitoring at up to five additional stream locations. The cost for each monitoring station shall not exceed \$3,500 for one-time capital costs and \$2,500 per year for operations and data management. The City shall reimburse the County for fifty percent (50%) of the capital and operations costs

for the Catherine Creek/20th Street station and one hundred percent (100%) for each additional station it requests.

V. LAKE LEVEL MANAGEMENT

The City shall continue to be responsible for the operation and maintenance of the outlet weir of Lake Stevens and for managing water levels within Lake Stevens. The County shall be responsible for installing and operating a recording lake level gage. The County shall be obligated to pay for thirty-five percent (35%) and the City shall be obligated to pay for sixty-five percent (65%) of the costs of lake level gaging, outlet weir operation, and lake level management. The County shall document and report to the City any lake gaging expenses it has incurred. The City shall then combine the expense records and prepare billings to the County for its share of the total lake level management costs incurred by either party. If the City annexes additional properties on the Lake Stevens lake front after January 1, 2007, the County's obligations for lake level management costs shall be reduced by one percent (1%) and the City's obligations increased by one percent (1%) for each three hundred seventy (370) feet of lake front annexed by the City.

VI. DRAINAGE INFRASTRUCTURE, HABITAT RESTORATION, AND NPDES PERMIT COMPLIANCE

A. Technical and Engineering Assistance – During 2007, on an on-call basis as requested by the City, the County shall provide technical and engineering assistance to the City for drainage infrastructure, habitat restoration, and NPDES permit compliance services. Drainage infrastructure assistance may include detention facility inspections, coordination of detention facility maintenance, drainage complaint investigations, field staff training, drainage project design, drainage facility construction, drainage plan review, and basin analyses including HSPF modeling. Habitat restoration assistance may include design, construction, and native plant installation, monitoring, and maintenance. NPDES permit assistance will help the City in meeting the requirements of the City's new Phase II NPDES municipal stormwater permit and may include water quality problem investigations; assistance with revisions to grading, drainage, and water pollution regulations, including low impact development standards; programmatic review of storm sewer maintenance, construction inspections and administration; illicit discharge identification; public education and outreach activities; and development of a future stormwater monitoring program. The City shall reimburse the County for the cost of technical and engineering assistance, provided that the total cost of these services shall not exceed \$60,000 in 2007 and that the County shall not be obligated to provide any services that exceed this cost.

B. Drainage System Inventory – If requested by the City, the County shall complete a detailed global positioning system (GPS) inventory of the entire drainage system within the city limits and provide the inventory to the City in a geographic information system format. The City shall reimburse the County for

the cost of this inventory, up to a maximum of \$42,000, and the County shall not be obligated to provide any inventory work that exceeds this cost.

C. Capital Projects – The County will design and construct the Parkway Crossing detention pond water quality retrofit project. This project is located within the Frontier Village annexation area. The City will reimburse the County \$10,700 per year from 2007 through 2021 to cover a portion of the cost of this project. By September 15th of each year, the County shall bill the City for the yearly payment, which shall be due and payable by the City on or before November 15th of each year. Advance payments of the yearly amounts shall not be allowed. Prior to beginning design of any additional surface water management capital project within the Lake Stevens UGA, the County shall consult with the City to develop a project design and cost-sharing agreement satisfactory to both parties.

D. Coordination and Future Work Program – Representatives of the County and City shall meet quarterly to review progress on services for drainage infrastructure, habitat restoration, NPDES permit compliance, drainage inventory, and capital projects. By September 30, 2007, the City and the County shall develop a detailed work program for drainage infrastructure, habitat restoration, NPDES permit assistance, drainage inventory, and capital projects to be provided in 2008.

VII. DRAINAGE IMPACTS TO DIKING DISTRICT #2

The County is developing an interlocal agreement with Diking District No. 2 for the purpose of reimbursing the District for the incremental costs of accommodating drainage from upland development. The uplands that drain to Diking District No. 2 cover 1177 acres, of which 893 acres are currently located within the Lake Stevens UGA. If such an interlocal agreement is signed, the City agrees to enter negotiations with the County and Diking District No. 2 regarding City assumption of a proportionate share of the payments to the District as annexations within the uplands occur. The City also agrees to consider increased tight-lining and detention standards for new development in areas that drain to Diking District No. 2 similar to the standards required by the County in SCC 30.63A.225 and 226.

VIII. INVASIVE AQUATIC PLANT MANAGEMENT

Portions of Lake Stevens are currently infested with Eurasian watermilfoil, a non-native invasive aquatic plant. Long term control of this and other potential invasive aquatic plants is important to protect public use and enjoyment of the lake and to prevent spread of the plants into other portions of the lake. By September 30, 2007, the City and the County shall develop a detailed work program for controlling the Eurasian watermilfoil and for funding the proposed control measures.

IX. FUNDING MANAGEMENT

Both the County and City utilize service charge revenues received from properties within their respective jurisdictions to support surface water management services. In order to promote a seamless transition from County or Drainage Improvement District No. 8 surface water management responsibility to City responsibility, the County and the City agree to review their respective utility service charges to accurately reflect the services provided to, the benefits received by, and/or the impacts created by individual properties. On December 13, 2006, the County Council approved Ordinance 06-125 increasing surface water utility service charges for lake front properties on Lake Stevens for the purpose of cooperative water quality and water resource management of Lake Stevens. These additional service charges shall be utilized by the County to pay a portion of its obligations as set forth in Sections III, IV, and V of this agreement. The County and the City shall develop a separate agreement covering billing of surface water utility fees for properties within City jurisdiction.

X. REIMBURSEMENT FOR SURFACE WATER MANAGEMENT SERVICES

All reimbursements from the City to the County or from the County to the City for surface water management services described in this agreement shall include the costs of salaries, benefits, and direct costs. No indirect or overhead costs shall be eligible for reimbursement. Billings shall be prepared on a quarterly basis. All bills shall be due and payable within sixty (60) days after receipt. Billing statements shall identify and itemize all costs incurred for that billing period.

XI. EFFECTIVENESS AND DURATION

- A. This Agreement shall become effective after the following:
1. Approval of the Agreement by the official action of the governing bodies of each of the parties hereto;
 2. Execution of the Agreement by the duly authorized representative of each of the parties hereto; and
 3. The filing of a copy of the Agreement with the Snohomish County Auditor in accordance with section XX.

- B. This agreement shall terminate on December 31, 2021, unless terminated earlier pursuant to Section XII.

XII. AMENDMENTS, EXTENSION, OR TERMINATION

This agreement may be amended, altered, clarified, or extended only by written agreement of both parties. Either party may terminate this agreement upon written notice received ninety (90) days prior to the requested date of termination.

Should termination of this agreement occur prior to December 31, 2021, the City may seek other means of funding O/M for the hypolimnetic aeration system. If the City determines that other funding sources are not available, the City may de-activate the hypolimnetic aeration system and winterize it according to the approved operation and maintenance manual, or take such other action, if any, it deems appropriate.

XIII. CONTINGENCY

The obligations of each party to this agreement are contingent upon local legislative appropriation of necessary funds in accordance with law.

XIV. DIRECTION AND CONTROL

The parties agree that each party will perform the services under this agreement as an independent contractor and not as an agent, employee, or servant of the other. The parties agree that each party is not entitled to any benefits or rights enjoyed by employees of the other. Each party specifically has the right to direct and control its own activities in providing the agreed services in accordance with specifications set out in this agreement. The other party shall only have the right to ensure performance.

XV. ACCESS TO BOOKS/RECORDS

Each party may, at reasonable times, inspect the books and records of the other party relating to performance of this agreement. Each party shall keep all records required by this agreement for five years after termination of this agreement for audit or inspection by the other party.

XVI. LIABILITY

No liability shall attach to either the County or the City by reason of entering into this agreement except as expressly provided herein. This agreement does not create any rights in third parties except as expressly provided herein.

XVII. INDEMNIFICATION AND HOLD HARMLESS

Each party shall protect, defend, hold harmless and indemnify the other party, their officers, elected officials, agents and employees, while acting within the scope of their employment as such, from and against any and all claims (including demands, suits, penalties liabilities, damages, costs, expenses, or losses of any kind or nature whatsoever) arising out of or in any way resulting from such party's own negligent acts or omissions related to such party's participation and obligations under this agreement. Each party agrees that its obligations under this subsection extend to any claim, demand, and/or cause of action brought by or on behalf of any of its employees or agents. For this purpose, each party, by mutual negotiation, hereby waives, with respect to the other party only, any immunity that would otherwise be available against such claims under the industrial insurance act provision of Title 51 RCW.

XVIII. SAVINGS CLAUSE

Nothing in this agreement shall be construed so as to require the commission of any act contrary to law, and wherever there is any conflict between any provisions of this agreement and any statute, law, public regulation or ordinance, the latter shall prevail, but in such event, the provisions of this agreement affected shall be curtailed and limited only to the extent necessary to bring it within legal requirements.

XIX. SEVERABILITY

Should any part, term or provision of this agreement be determined by a court of competent jurisdiction to be invalid, the remainder of this agreement shall not be affected, and the same shall be continued in full force and effect.

XX. FILING

This agreement shall be filed with the Snohomish County Auditor's Office pursuant to RCW 39.34.040.

XXI. NOTICE

All notices and payments shall be made to:

Snohomish County
Surface Water Management Division
3000 Rockefeller Avenue, MS 607
Everett, Washington 98201

City of Lake Stevens
1812 Main Street, PO Box 257
Lake Stevens, Washington 98258

XXII. INTERLOCAL COOPERATION ACT

The parties agree that no separate legal or administrative entities are necessary in order to carry out this Agreement. If determined by a court to be necessary for purposes of the Interlocal Cooperation Act, Ch. 39.34 RCW, an administrator or joint board responsible for administering the Agreement will be established by mutual agreement. Any real or personal property used by either party in connection with this Agreement will be acquired, held, and disposed of by that party in its discretion, and the other party will have no joint or other interest herein.

XXIII. ENTIRE AGREEMENT

This agreement represents the entire integrated agreement between the parties and supercedes all prior negotiations, representations or agreements, either written or oral.

IN WITNESS WHEREOF, the parties hereto have executed this agreement as of the day and year first above written.

ATTEST:

BY: Norina Scott
City Clerk

CITY OF LAKE STEVENS

BY: Wm Little
TITLE: Mayor

APPROVED AS TO FORM ONLY:

Grant K. Reed
City Attorney

ATTEST:

BY: Terri Baileiff

SNOHOMISH COUNTY:

BY: SSP
TITLE: Executive Director

APPROVED AS TO FORM ONLY:

Good W. St 1/26/07
Deputy Prosecuting Attorney

COUNCIL USE ONLY	
Approved:	<u>4-25-07</u>
Docfile:	<u>D-25</u>

Exhibit "2"

CONFORMED COPY
200912220691 61 PGS
12/22/2009 2:38pm \$0.00
SNOHOMISH COUNTY, WASHINGTON

FIRST AMENDMENT
TO
INTERLOCAL AGREEMENT FOR SURFACE WATER MANAGEMENT
SERVICES BY AND BETWEEN
Snohomish County and the City of Lake Stevens

THIS FIRST AMENDMENT TO INTERLOCAL AGREEMENT FOR SURFACE WATER MANAGEMENT SERVICES BY AND BETWEEN SNOHOMISH COUNTY AND THE CITY OF LAKE STEVENS (this "Amendment") is entered into as of this 2nd day of December, 2009, by and between SNOHOMISH COUNTY, a political subdivision of the State of Washington (the "County"), and the CITY OF LAKE STEVENS, a Washington municipal corporation (the "City").

RECITALS

A. WHEREAS, the County and the City are the parties to that certain INTERLOCAL AGREEMENT FOR SURFACE WATER MANAGEMENT SERVICES BY AND BETWEEN SNOHOMISH COUNTY AND THE CITY OF LAKE STEVENS dated April 27, 2007 (the "Original Agreement"), a true and correct copy of which is attached as Exhibit 1, pursuant to which effective surface water management services are provided at a reasonable cost to residents and property owners in the Lake Stevens Urban Growth Area (UGA) during and after the period of transition from unincorporated County jurisdiction to City jurisdiction, including but not limited to lake aerator operations; and

B. WHEREAS, the Original Agreement provides cost-share adjustment formulas in the event of annexations of certain sizes and property types, as stated in Section III.D.5, Section IV.A, and Section V of the Original Agreement, that increase the City's share of costs and decrease the County's share of costs for aerator operation and maintenance (O/M), equipment replacement, major repair costs, monitoring, and lake level management, effective on January 1st of the year following the year in which the effective date of annexation occurs. The cost adjustment formulas in the Original Agreement anticipated annexation of an area, but did not anticipate the continued inclusion of that same area in the Snohomish Watershed Management Area (WMA) after annexation; and

C. WHEREAS, the City and the County will execute that certain Interlocal Agreement for Including the Lake Stevens Southwest Annexation Area (BRB No. 03-2009) in the Snohomish Watershed Management Area by and between City of Lake Stevens and Snohomish County (WMA ILA), substantially in the form attached to this Agreement as Exhibit 2, which provides for the inclusion of the Southwest Annexation Area in the Snohomish WMA during the year 2010 if annexation occurs on or before December 31, 2009; and

D. WHEREAS, if the WMA ILA is executed and annexation of the Southwest Annexation Area occurs on or before December 31, 2009, the County will collect service

charges from that area during 2010, and it will not be necessary for the cost share formulas in Section III.D.5, Section IV.A, and Section V, to be applied to the Southwest Annexation Area during that time;

AGREEMENT

NOW, THEREFORE, in consideration of the covenants hereinafter set forth and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the County and the City agree as follows:

1. Amendment

The cost share adjustment formulas as stated in the Original Agreement, Section III.D.5, Section IV.A, and Section V, are not applicable to the Southwest Annexation Area during the time that such area is included in the Snohomish WMA. The cost share adjustment formulas in the Original Agreement, however, will be applicable to the Southwest Annexation Area immediately as of the date that the Southwest Annexation Area is no longer included in the Snohomish WMA.

2. Ratification

Except as modified by this Amendment, the Original Agreement shall remain in force and effect in accordance with its terms and is hereby ratified and affirmed.

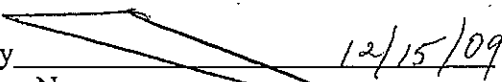
3. Execution in Counterparts; Exchange of Facsimile Signatures

This Amendment may be executed in counterparts, each of which shall be an original and all of which shall together constitute one and the same instrument.

IN WITNESS WHEREOF the parties hereto have executed this Amendment as of the date first above written.

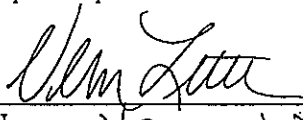
THE COUNTY:

Snohomish County, a political subdivision of the State of Washington

By  12/15/09
Name: MARK SOINE
Title: Deputy Executive

THE CITY:

The City of Lake Stevens, a Washington municipal corporation

By 
Name: Vern Little
Title: Mayor

FIRST AMENDMENT TO INTERLOCAL AGREEMENT
FOR SURFACE WATER MANAGEMENT SERVICES

COUNCIL USE ONLY	
Approved: <u>12/2/2009</u>	<u>86-117</u>
Docfile: <u>D-4</u>	

PAGE 2 OF 3

Approved as to Form:

M. Sch 6-25-09
Deputy Prosecuting Attorney

Approved as to Form:

Grant K. Weed
City Attorney

EXHIBIT B

INTEGRATED AQUATIC PLANT CONTROL PLAN

Lake Stevens

Prepared for

City of Lake Stevens



Photo Courtesy of Gene Williams: Snohomish County Surface Water Management

January 2011

Note:

Some pages in this document have been purposefully skipped or blank pages inserted so that this document will copy correctly when duplexed.

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PROJECT OVERVIEW

Lake Stevens is the largest and deepest lake in Snohomish County. Approximately 200 acres of this 1,040-acre lake is littoral zone (the area between the shore edge and a depth of about 20 feet).

Eurasian watermilfoil (*Myriophyllum spicatum*, or milfoil) was first observed in the Lake Stevens in the early 1980s (Gene Williams, Snohomish County Surface Water Management, personal communication). It did not reach problematic levels until 2006, when its colonization expanded from a few isolated plants to aggressive growth throughout much of the littoral zone. An aquatic plant survey in July 2010 indicated that dense milfoil covered approximately 135 acres of the lake. Now, milfoil growth severely limits many of the beneficial uses of the lakes for both people and animals.

The City of Lake Stevens applied for a planning grant from the Washington State Department of Ecology (Ecology) to develop an Integrated Aquatic Vegetation Management Plan (IAVMP) to address the current milfoil problem and future aquatic plant management needs. The planning process included a series of public and steering committee meetings, ending with final agreement on the recommended plan.

This report describes the IAVMP (referred to in this report as the Aquatic Plant Plan) developed for Lake Stevens. The goal of this plan is to eradicate milfoil from Lake Stevens. The following are the basic recommendations for aquatic plant control in the lake:

- Apply one large scale triclopyr treatment to eliminate the majority of milfoil from the lake
- Make targeted, small-scale applications of triclopyr to manage small patches of milfoil
- Conduct ongoing hand-pulling or bottom barrier installation to combat small and recurrent patches of milfoil
- Conduct annual diver surveys of the littoral zone and quantitative reporting of the acres and locations of identified invasive plants
- Establish an Aquatic Plant Control Advisory Committee for the lake whose function is to make recommendations annually about controls needed and to review aquatic plant management goals

LAKE AND WATERSHED CHARACTERISTICS

Physical Characteristics

Table 1 summarizes key physical characteristics of Lake Stevens. Lake Stevens is the largest and deepest natural lake in Snohomish County, with a surface area of 1,040 acres, a maximum depth of 47 meters (154 feet), and an average depth of 19 meters (64 feet). Despite its large size, the contributing drainage area (4,371 acres) is only about four times greater than the lake. This characteristic limits the impact of upland processes on nutrient dynamics in the lake. Lake Stevens is fed by Lundeen, Kokanee, and Stitch creeks. The shoreline and watershed is densely

developed with large residential dwellings and has been highly modified with bulkheads, fill or other armoring structures (Snohomish County 2008). The shoreline sediments are generally gravelly sand except where organic materials have accumulated.

Table 1. Physical Characteristics of Lake Stevens and its Watershed.

Characteristic	English Units	Metric Units
Watershed area	4,371 acres	19.15 square kilometers
Surface area	1,040 acres	4.21 square kilometers
Ratio of Watershed : Lake Area	4.2	4.2
Lake volume	65,000 acre-ft	8 x 10 ⁷ cubic meters
Maximum depth	154 feet	47 meters
Mean depth	64	19.4 meters
Shoreline development	7.1 miles	11.43 kilometers

Lake Stevens is drained by an outflow channel that flows into Catherine Creek, which flows into Little Pilchuck Creek and ultimately to the Pilchuck River. At the confluence of Catherine Creek and the Little Pilchuck Creek, there is a natural barrier to fish passage which prevents salmonids using the Pilchuck river system from reaching Lake Stevens (WDFW 2010).

Geology

Lake Stevens lies within the Puget Sound Lowland geologic province. This area is characterized by glacial activity that occurred 12,000 years ago during the Vashon Stage of the Frasier glaciations. Large volumes of sand and gravel were moved through the area in glacial meltwater streams before each ice advance. As the glaciers advanced into the area, they caused compaction of the sand and gravel, transforming it into glacial till. The area now surrounding Lake Stevens is comprised of Vashon advance outwash and Vashon Till (USGS 1985, Snohomish County Public Works 2007).

Wetlands

Due to the dense development and the highly modified characteristics of the shoreline of Lake Stevens, there are few areas of wetland adjacent to the lake. In the northern end of the lake, there are about 150 meters (492 feet) of fringe wetland, and a more extensive wetland area extending north along Little Pilchuck Creek. Another wetland area is adjacent to the southeast shore of the Lake and extends southward along Stitch Creek. A very small wetland exists in the easternmost part of the lake along its outflow channel (The Watershed Company 2010).

Land Use

The Lake Stevens watershed is subject to intense residential and commercial development. A mid-1990s survey indicated that over 52 percent of the land area was developed. Lake Stevens is one of the most densely developed lakes in the county, with 349 houses along the lakeshore. These houses are typically used as full-time residences; many have maintained lawns that extend to the water's edge and much of the shoreline is armored with bulkheads, riprap or other materials. There are five public access points to the lake which have docks and swimming areas, and two also have boat launches (Snohomish County Surface Water Management 2008).

Water Quality

Lake Stevens is considered to have good water quality. The comparatively small watershed (for the lake's size) protects the lake from pollution impacts originating from the surrounding land as compared to lakes with larger contributing watersheds. Despite having high water quality now, Lake Stevens historically suffered from elevated phosphorus levels and algal blooms during the summer. The installation of an aeration device in 1994 has alleviated this problem, though its effectiveness may be diminishing (Snohomish County Surface Water Management 2008).

Lake Stevens becomes strongly stratified during the summer. The upper layer (epilimnion) is characterized by warm temperatures and high dissolved oxygen levels. The lower layer (hypolimnion) is characterized by cooler temperatures and low dissolved oxygen levels. As is typically of many lakes that stratify, lower oxygen levels near the sediment surface results in the release of phosphorus to the water column. This process is thought to be responsible for the relatively high phosphorus concentrations (69 µg/L) documented in a 1986 study of Lake Stevens, and is also thought to have influenced nuisance periodic blooms of blue green algae.

In 1994, Snohomish County installed an underwater aeration system that supplies oxygen to the hypolimnion to reduce the release of phosphorus from the lake's sediments. Success at mitigating the phosphorus problem was high for the first several years of operation. Low iron availability and a trend of increasing phosphorus concentrations in the hypolimnion in recent years, however, indicate diminishing effectiveness of the system. The water clarity of Lake Stevens is high, with Secchi depths ranging between 4 and 10 meters (13 and 33 feet). Chlorophyll concentrations between 2003 and 2008 were low (1.6 µg/L) and have remained stable despite increasing phosphorus concentrations (Snohomish County Surface Water Management 2003, Snohomish County Surface Water Management 2008).

Based on high water clarity, low to moderate dissolved oxygen levels, low chlorophyll values, but occasional blue-green algal blooms, Lake Stevens may be classified as oligo-mesotrophic. Phosphorus inputs from lawn and garden fertilizer applications in the watershed coupled with the lake's diminishing ability to sequester phosphorous are pushing Lake Stevens towards a more eutrophic state (Snohomish County Surface Water Management 2008).

Water Rights

Ecology was contacted to provide information regarding the water rights for diversions out of Lake Stevens and its outflow channel. There are 37 documented water rights. The primary purposes stated for the active records are "domestic general". Domestic general is defined as use of water for all domestic uses not specifically defined in the water right record or not defined by the other specific domestic use categories, "irrigation" means lawn and garden watering with definite acreage, golf courses, greenhouses, and others, and "recreation and beautification" means the water may be used for beautifying private and public grounds and supplying water to swimming pools, boating ponds, etc. (Ecology 2010c).

Fish and Wildlife Community

Warm water fish species dominate the fish population in Lake Stevens. Warm water-resident fish include:

- Yellow perch (*Perca flavescens*)
- Brown bullhead (*Ameiurus nebulosus*)

- Pumpkin seed sunfish (*Lepomis gibbosus*)
- Largemouth bass (*Micropterus salmoides*)
- Smallmouth bass (*Micropterus dolomieu*)
- Black crappie (*Pomoxis nigromaculatus*)

Lake Stevens also supports a fishery of a variety of resident coldwater species; kokanee salmon (*Oncorhynchus nerka*), cutthroat trout (*Oncorhynchus clarki*), and mountain whitefish (*Prosopium williamsoni*). Anadromous salmonids do not use Lake Stevens due to a barrier to passage lower in the watershed. The cold water species found in Lake Stevens are the result of natural spawning and ongoing stocking efforts by the Washington Department of Fish and Wildlife (WDFW). Harvest size restrictions are enforced for large and smallmouth bass to maintain a productive sport fishery for warm water species (WDFW 1997).

Note: Information about the life-cycle and habitat needs of Kokanee Salmon in Washington Lakes is available from the King County website: <http://www.kingcounty.gov/environment/animalsandplants/salmon-and-trout/identification/kokanee.aspx>.

Beneficial Use

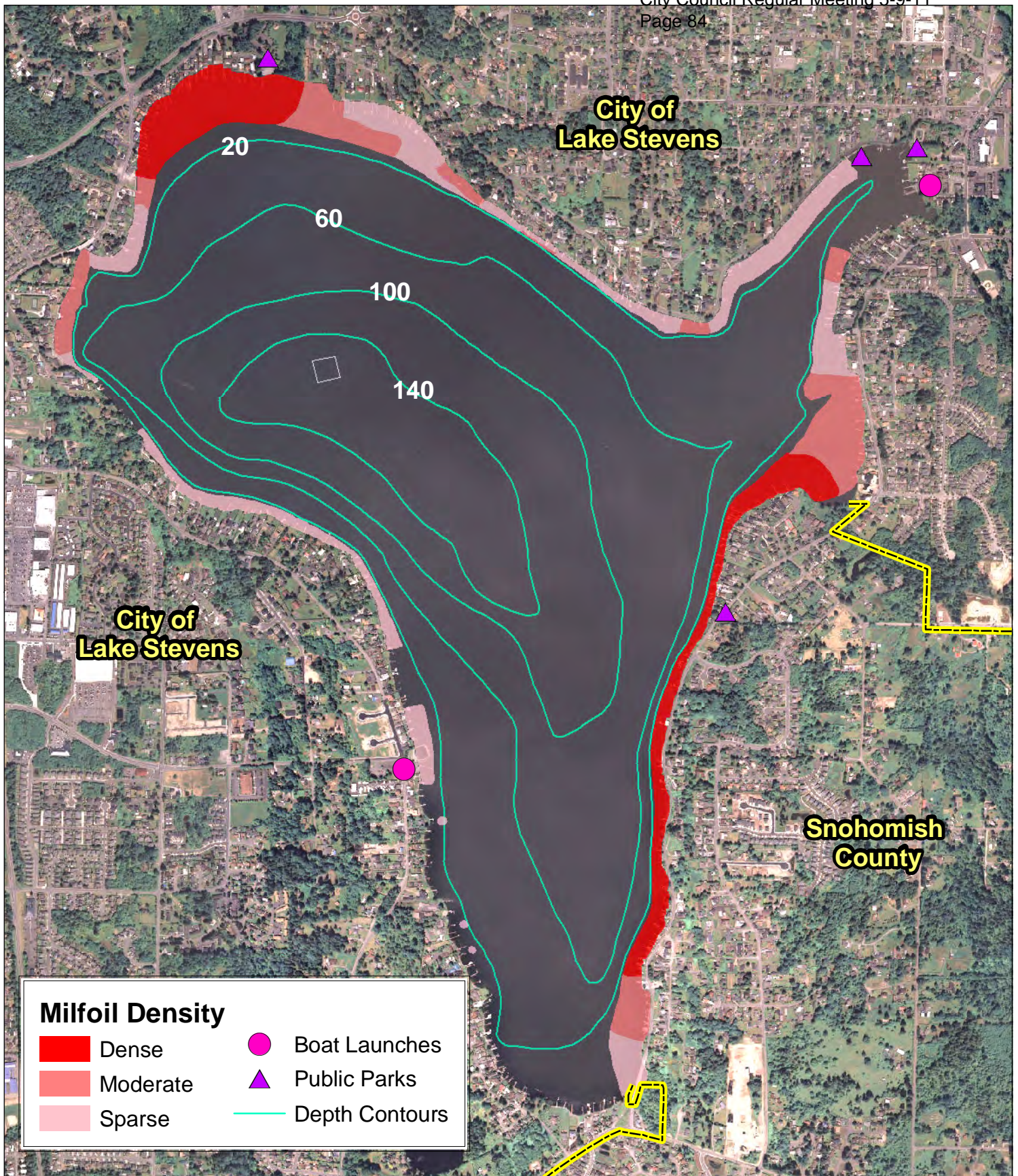
Good water quality, striking panoramas of the North Cascade Mountains, public parks and boat ramps, and proximity to suburban Seattle population centers make Lake Stevens a popular recreation spot for residents and visitors. Five public parks provide access to swimmers and picnickers. Swimming also takes place on the many private docks and shoreline areas. Public boat ramps located at Willard Wyatt Park on the west shore, and the City boat launch in the northeast cove provide lake access to boaters (Figure 1). Water skiing is a popular activity throughout the lake. Jet skiing is an activity that also attracts many users to the area. Good numbers of game fish and pan fish brings anglers to the lake. Rowers from the Lake Stevens Rowing Club also use the lake for training, and host occasional regattas with other clubs.

Though the shoreline has been highly altered, the remaining standing trees provide habitat for bald eagles and osprey, and blue herons can be seen stalking fish along the shoreline. The city of Lake Stevens prides itself on the beneficial uses of the lake, and every July it hosts Aquafest, which includes many water sports demonstrations and activities for the public.

Aquatic Plant Community

Lake Stevens supports moderate levels of aquatic plants. The steep shoreline along much of the lake limits the area of littoral zone in which aquatic plants can become established. In the shallow, gradually sloping areas like the bay in the northern end of the lake, plant growth is prolific. A few other regions also support dense vegetation (Figure 2). The plant species found in Lake Stevens were documented in a survey conducted by Ecology in 1997 (Ecology 2010b):

- Watershield (*Brasenia* spp.)
- Waterlily (*Nuphar polysepalum* and *Nymphaea odorata*)
- Curly leaved pondweed (*Potamogeton crispus*)
- Pondweed (*Potamogeton* spp.)
- American Waterweed (*Elodea canadensis*)
- Water Nymph (*Najas flexilis*)
- Stonewort (*Chara* spp)



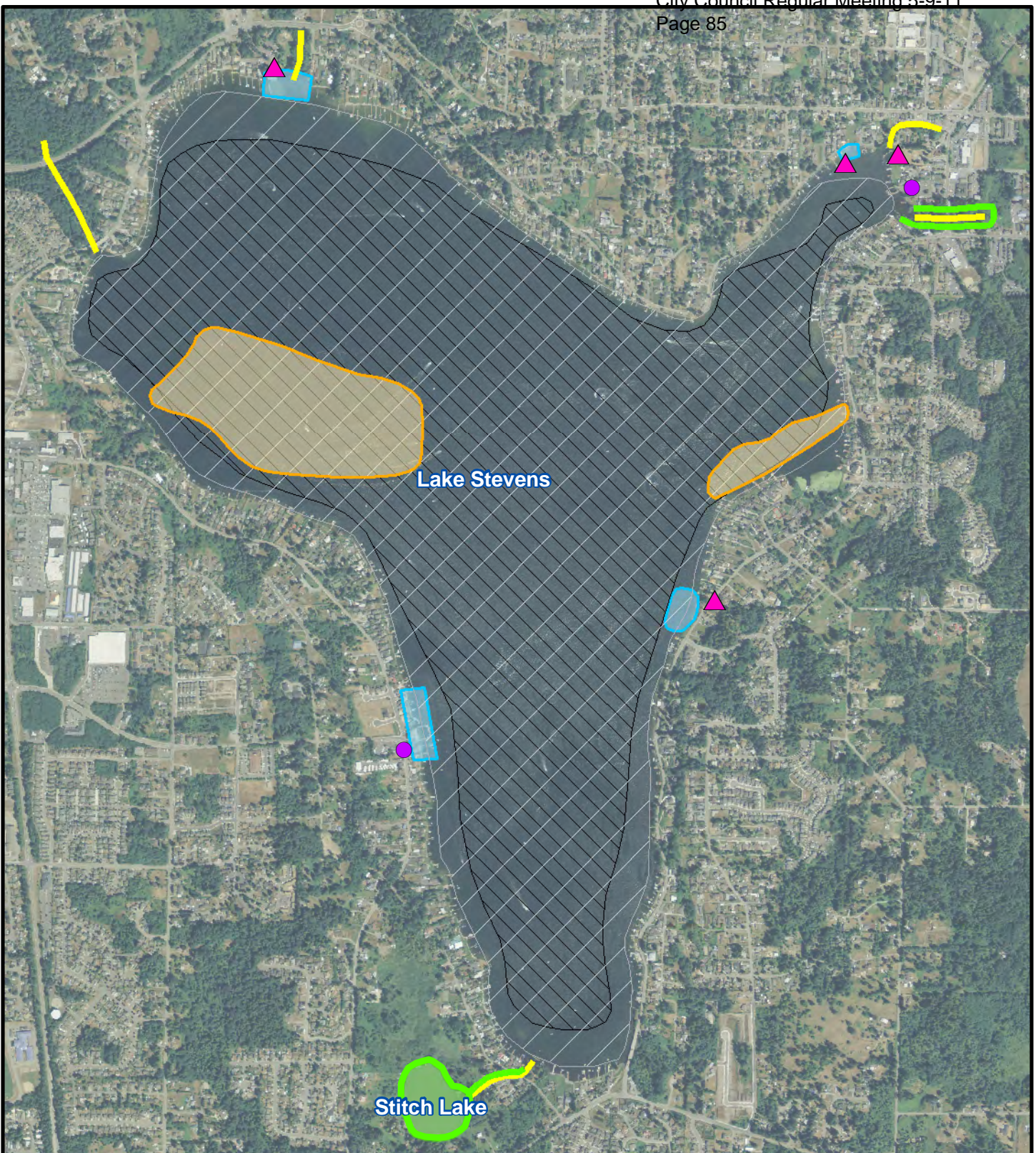
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Lake Stevens Eurasian Watermilfoil (EWM) Locations 2010



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Legend








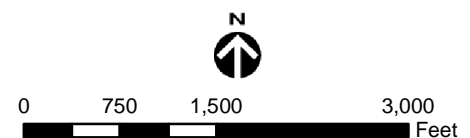
- | | | | |
|---|-------------------------|---|----------------------------|
|  | Public park |  | Beaver and wetland habitat |
|  | Boat launch |  | Fishing |
|  | Salmon spawning habitat |  | Swimming beach |
|  | Rowing | | |
|  | Waterskiing | | |

Figure 2. Beneficial use areas in Lake Stevens.



HERRERA
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Aerial photograph: USDA, 2009

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- Brittlewort (*Nitella* spp.)
- Eurasian Watermilfoil (*Myriophyllum spicatum*)

Eurasian watermilfoil (milfoil), native and non-native pondweed, and common elodea dominate most of the littoral zone. Watershield and fragrant water lilies are also found in dense patches in some coves. Aquatic plants have not posed a significant problem for Lake Stevens until recently. Plant surveys as early as 1982 identified the presence of milfoil, but it was limited to isolated patches or a few scattered plants, and no action was taken to try to control its spread. No milfoil was found during the 1990s, and it was hoped that it might be gone altogether from the lake. Milfoil was again noticed in 2006, and diver surveys between then and 2010 document a rapid colonization. In 2006, small to medium sized patches and isolated plants were identified throughout the shallows of the north end of the lake. By 2008, the northern end of the lake was densely colonized, and scattered plants and patches were found around much of the perimeter. No surveys were conducted in 2009, but surface observations by Snohomish County employees noted a dramatic increase in density and extent of the infestation over the previous year (Gene Williams, personal communication). A diver survey of the entire lakeshore in July 2010 documented that milfoil is now the dominant vegetation species for the majority of the shoreline, especially in broad shallow coves with localized densities of more than 30 plants per square meter. The location and relative density of milfoil observed in the 2010 diver survey is shown in Figure 1. A thorough characterization of the plant community in Lake Stevens has not recently been conducted; therefore, the distribution and density of aquatic plants other than milfoil is unknown.

DEVELOPMENT OF THE PLAN

Public Involvement

Public involvement has included steering committee meetings and public meetings. The steering committee was comprised of the already established Lake Stevens Citizens Shoreline Advisory Committee, a Snohomish County representative, city staff, and council members.

The first steering committee meeting for development of the Lake Stevens Aquatic Plant Plan was held on September 8, 2010. At this meeting, the group completed the problem statement, identified and developed management goals, and mapped beneficial uses. The last portion of the meeting was devoted to discussing the various control options available and their applicability to Lake Stevens, the differences between control or suppression and eradication, and a general discussion on aquatic herbicides. The meeting ended with a question and answer session on lake problems and control techniques.

The second steering committee meeting was held on September 30, 2010. This meeting's primary focus was discussing three specific scenarios that were most applicable to managing the milfoil problem in Lake Stevens. One strategy involved using mechanical harvesting to control milfoil and restore the beneficial uses of certain areas of the lake; the second strategy involved treatment with the herbicide triclopyr to eradicate the milfoil; the third strategy involved initial treatments with the herbicide fluridone to eradicate the milfoil. After thoughtful discussion of the differences in cost and weighing the reliability of the different strategies and potential for long-term satisfaction, the second option (triclopyr and physical methods) was selected as the

preferred strategy. This was based on the benefits of using an herbicide that is selective for milfoil and its proven effectiveness against the weed.

In addition to steering committee meetings, two public meetings were held. The purpose of the first meeting (held on August 25, 2010) was to notify the public that the planning process was underway, to discuss the goals of the plan, and to present an overview of aquatic plant management issues and the planning process for development of this IAVMP. A second public meeting was held on October 14, 2010. The purpose of the second public meeting was to summarize the three scenarios originally presented to the steering committee and provide an overview of the steering committee's decision process and then to describe the preferred strategy. The meeting ended with a Q&A session. Most of the people present appeared to strongly support the project; a few voiced some concern about the use of herbicides, but overall did not seem opposed to the project.

Announcements for public meetings included notices in the local paper and direct communication with members of the Lake Stevens Citizens Shoreline Advisory Committee, Ecology, and WDFW. Appendix A contains sign-in sheets or other attendance information.

Aquatic Plant Management Goals

The following goals were developed by the steering committee:

- Effectively eradicate milfoil from Lake Stevens
- Maintain natural submerged and shoreline vegetation
- Protect the unique population of Kokanee salmon
- Monitor noxious emergent plants such as fragrant water lily and purple loosestrife
- Educate lake users on preventing the introduction of aquatic invasive species
- Inform lake residents on proper techniques for managing plants around their docks

Problem Statement

These goals were used to create a problem statement for Lake Stevens. The purpose of the problem statement is to describe as clearly as possible how the lake and its inhabitants are being negatively impacted by aquatic plants. The problem statement is as follows:

Lake Stevens provides important habitat for many fish, including a unique population of kokanee salmon, and wildlife such as otters, bald eagles, and others. In addition it is valued by humans for its aesthetic beauty, and offers a range of fishing, swimming, boating, waterskiing and shoreline activities for residents and visitors. These uses are currently being impacted by prolific growth of milfoil along a majority of the shoreline.

(While other noxious weeds and plants of concern; fragrant water lily, purple loosestrife and curly leaf pondweed are present in, or adjacent to the lake, they are not currently problematic), The dense stands of milfoil found along much of Lake Stevens's shoreline are limiting lake access to residents, reduce the lake's aesthetic value, and pose a safety hazard to swimmers and boaters. The monotypic and

dense nature of the growth is believed to be inhibiting fish and wildlife and causing localized water quality problems.

Potential Plant Control Scenarios

As part of a comprehensive review of plant management techniques, all control alternatives described and approved by Ecology (Ecology 2010a) were presented to the Lake Stevens steering committee. These methods included a suite of mechanical (harvesting and rotovation), biological (grass carp and milfoil weevils), and herbicidal control strategies. The process of discussing the preferred control options(s) began with presenting the entire range of control alternatives typically available to Washington State residents. The advantages and disadvantages of each method were described in the context of how they might be used on Lake Stevens. Descriptions of all Ecology approved plant control techniques and the appropriateness of each option are presented in Appendix B.

The main plant of concern in Lake Stevens is milfoil. One area of the lake has a population of fragrant water lily which has existed for several years without significantly expanding. A pioneering population of curly leaf pond weed has been documented since 2008, which is cause for concern, but based on the plants presence in other Snohomish County lakes it is not expected to reach problematic levels (Gene Williams, Snohomish County Surface Water Management, personal communication). Strategies for controlling each of these weeds were presented to the steering committee, but the majority of discussions were focused on milfoil eradication and control techniques.

Three detailed strategies for controlling milfoil were presented:

- Semi-annual harvesting of milfoil in selected beneficial use areas
- Combination of fluridone, triclopyr and physical techniques (hand pulling and bottom barrier)
- Combination of triclopyr herbicide and physical techniques (hand pulling and bottom barrier)

Summary information on the three treatment scenarios presented to the steering committee can be found in Appendix C. The following is a brief description of each along with the key reasons for their rejection or acceptance.

Scenario 1: Harvesting

Twice-annual harvesting was discussed as a non-chemical control option for restoring the beneficial uses of the lake. The slow rate of harvesting (approximately 3 acres per day per machine) dictated that only a portion of the 135-acre area that is currently impacted by milfoil (Figure 2) could feasibly be managed through mechanical harvesting. The scenario that was presented assumed that 30 to 40 acres, the maximum amount that could be harvested by two machines in a workweek, would be treated. Some members of the steering committee were initially drawn to this treatment strategy because it did not rely on chemical usage. However, the strategy was ultimately rejected for the following reasons:

- Does not meet goal of milfoil eradication
- Limited control area and duration of control

- Difficult to select areas for harvest that would be viewed as equitable
- High annual cost

Scenario 2: Fluridone

A large scale fluridone treatment forms the basis of the second treatment scenario. In this scenario, the entire littoral zone (estimated at 200 acres) would be treated with the systemic herbicide fluridone in an effort to permanently eliminate the majority of the milfoil population. Remaining patches of milfoil would be treated in the following seasons using the herbicide triclopyr or by hand pulling or bottom barrier where and when it becomes appropriate. The goal of this strategy is to completely eliminate milfoil from the lake within 10 years. A secondary goal of this strategy is to minimize the amount of herbicides used by relying on physical methods whenever possible. This scenario was attractive to some members of the group because of its potential to simultaneously control curly leaved pondweed. Steering committee members also liked the shorter irrigation restriction associated with fluridone than the other herbicide strategy that was presented (below). Despite these merits, this strategy was rejected for the following reasons:

- Uncertainty in treatment effectiveness due to contact time requirements
- Damage to native plants
- Need for repeat applications in the first season

Scenario 3: Triclopyr

A large scale triclopyr treatment forms the basis of the third treatment scenario presented. In this scenario, the entire littoral zone would be treated with the systemic herbicide triclopyr, in an effort to permanently eliminate the majority of the milfoil population. Remaining patches of milfoil would be treated in the following seasons with triclopyr or by hand pulling or bottom barrier installations where appropriate. The goal of this strategy is to completely eliminate milfoil from the lake within 10 years. A secondary goal of this strategy is to minimize the amount of herbicides used by relying on physical methods whenever possible. This treatment scenario was ultimately selected by the steering committee. The primary advantages were:

- More certainty for treatment effectiveness
- No damage to native plants and therefore less habitat impact
- More immediate plant die-off
- No need for repeat applications the first season

Details on how this treatment scenario will be enacted are presented in detail in the *Recommended Plant Control Plan* section below. The following is provided for more detail on the control techniques that comprise the selected scenario.

General Information for Selected Strategies

Triclopyr

Triclopyr is a fast-acting systemic herbicide that is selective in controlling dicots (flowering plants that have two seed leaves) such as milfoil. Triclopyr is not effective against most native submerged plants such as native pondweed, water nymph, or common elodea, since most of these are monocots (flowering plants that have one seed leaf). Triclopyr is available in both solid and liquid formulas. Both formulas are effective in controlling milfoil. The liquid formula is less

expensive, but the pellet form is more appropriate for targeted “spot” treatments, and deeper water applications. Triclopyr works by mimicking the plant growth hormone auxin. When dicots are exposed to high concentrations of auxin, their stems twist and elongate in an uncontrolled fashion which causes the plants to die within a few weeks of treatment.

Triclopyr is considered to be safe for humans and the environment. According to the EPA factsheet (U.S. EPA 1998), Triclopyr was found to be slightly toxic for birds, and practically non-toxic for mammals, amphibians and freshwater fish and insects. Triclopyr typically has a half life in water ranging from 1 to 10 days depending on sunlight and temperature (National Pesticide Information Center 2002). More information on triclopyr toxicity is presented in Appendix D.

There is a 120-day irrigation restriction associated with the use of triclopyr. This means that water that has been treated (i.e., lake water) cannot be used for watering lawns, gardens or trees for 120 days following the application. This period can be shortened if laboratory tests indicate that concentrations of triclopyr in the water are less than 1 part per billion. Dissipation rates vary depending on dilution, temperature, and sunlight, but triclopyr concentrations are often less than 1 part per billion within 25 to 30 days following treatment (Scott Shuler, personal communication). It is important that lake side residents are informed of the risks of using lake water to irrigate their plants, especially trees and vegetables, before the irrigation restriction has been lifted.

The maximum allowable application rate for triclopyr may not exceed 2.5 ppm for the treatment area within a single growing season. Careful dosing calculations will be necessary for areas that may be treated twice within a season to make sure that the maximum allowable dose is not exceeded.

Each year the triclopyr, or any herbicide is applied to the lake, a NPDES pesticide application permit needs to be obtained through Ecology. To receive this permit, a notice of intent must be submitted to Ecology. The most up to date application materials are available at Ecology’s website: http://www.ecy.wa.gov/programs/wq/pesticides/final_pesticide_permits/aquatic_plants/aquatic_plant_permit_index.html. An example of the notice of intent paperwork is presented in Appendix D.

The physical strategies (i.e. hand pulling and bottom barrier installation) require that a hydraulic project approval (HPA) be issued by WDFW. WDFW has developed a general HPA for aquatic plant management. The “Aquatic Plants and Fish” (WDFW 1998) document may be obtained from WDFW and will serve as the HPA for aquatic plant removal projects.

Some residents had concerns about the use of chemicals in an aquatic environment. Specifically, they were concerned about the potential impacts that herbicides could have on the lake’s kokanee salmon population. The timing of the application of several herbicides, in certain waterways, are dictated by “timing windows” to minimize the risk that the herbicides may pose to fish and wildlife. Lake Stevens is not specifically listed as having a timing window (the default window for unlisted lakes is July 15 to October 31). Neither of the two herbicides initially considered for milfoil control in Lake Stevens (i.e., fluridone and triclopyr), are considered a significant risk because of their low toxicity to fish. Toxicity information for fluridone and triclopyr are contained in Appendix D. The following summary of the herbicide approval process is provided for clarification.

To be approved for use in aquatic environments, an herbicide must pass stringent toxicity testing by the federal government. These tests are designed to assess impacts to the target population (plants) and non-target populations such as fish, aquatic insects, and other organisms. The tests also examine what happens to the chemical over the long-term to insure the chemical quickly breaks down into a non-toxic form and that, for example, it does not accumulate in sediments or fish tissue. Herbicides approved for use in Washington State undergo an additional review process called a risk assessment. Many of the aquatic herbicides approved for use in the United States have been approved for use in Washington; although a few are not allowed under the State's more stringent standards. The low toxicity of the herbicides (triclopyr and fluridone) considered for use in this plan warranted their acceptance for use in Washington State.

Hand Pulling

Hand pulling works much like weeding a garden. Scuba divers remove the vegetative and rooted portions of milfoil plants by hand. Since milfoil can spread by plant fragments, special care needs to be taken to make sure that milfoil plant fragments are not dislodged or released during the pulling process. This requires that each plant and fragment be placed in a bag and removed from the lake. For this reason, only divers trained in milfoil removal should attempt hand pulling. Individual plants or small patches of milfoil can be effectively managed using this technique. Isolated plants can often be collected by divers during the annual survey of the lake. However, if there are larger patches, or many areas with individual plants or small patches, a separate dive survey will be required.

Bottom Barrier

Bottom barrier is a geo-textile fabric that is installed over the top of milfoil beds. It works in the same fashion as weed barriers used in landscaping. The cloth is too dense to allow milfoil plants grow through or for light to penetrate from the surface. Milfoil plants covered by the cloth will die because they cannot get the sunlight they need to photosynthesize. Bottom barriers require regular maintenance to remove accumulated sediments and to check that the fabric has not been dislodged. Bottom barrier comes in rolls of about 7 feet by 100 feet, or sheets that are 30 feet by 50 feet, and therefore is typically used to control small patches of sediment surface. It is often used near boat launches to reduce the potential for plant reintroduction or in places where repeated hand-pulling has not been successful in eliminating the plant.

Other

Since controlling fragrant water lily and curly leaf pondweed are not priorities at this time, treatment scenarios specifically targeting these plants were not presented. The options of using glyphosate herbicide for water lily control and fluridone herbicide for pondweed control in the future were discussed and are included as future considerations.

RECOMMENDED PLANT CONTROL PLAN

The primary goal of the aquatic plant management plan for Lake Stevens is the eradication of milfoil. Due to the large size of Lake Stevens and the high potential for reintroduction from outside recreational users, it will take a concerted, long-term effort to achieve this goal. However, the steering committee has made it clear that they hope to achieve and permanently maintain a near eradication status for milfoil. The term 'near eradication' is used to indicate that although the ultimate goal is eradication, it may be difficult if not impossible to achieve. On an

annual basis if a near-eradication level is achieved the plan will be considered successful, while over the long term continued surveys and treatments will almost certainly be required. A secondary priority of the steering committee is to minimize the use of herbicides.

The steering committee agreed on a plant management strategy that will employ a combination of large scale and small scale, chemical treatments with the selective herbicide triclopyr, and using mechanical techniques such as hand pulling and bottom barrier installation, where and when appropriate.

Treatment of the entire 200-acre littoral zone with the herbicide triclopyr will be implemented in the first few years of this strategy to kill the majority of the milfoil population. As the milfoil presence in Lake Stevens shifts from expansive uninterrupted stands to occasional small patches or isolated plants, the control strategy will rely increasingly on spot treatments and physical techniques. Thorough surveys by scuba divers will be required throughout all stages of implementation of this plan, because early detection and immediate response are integral to achieving and maintaining eradication.

Year 1

The first step of this plan will be to treat the entire 200-acre littoral zone of the lake with triclopyr. Milfoil was present throughout most (i.e., 136 acres) of the littoral zone of the lake as of July 2010, and treating the whole littoral zone insures that any new areas of milfoil growth would be treated as well. (Observations made in late summer 2010 indicated that milfoil had already colonized and area identified as having no milfoil a few months previous.)

Triclopyr is most effective when applied in the spring, early in the plant growth cycle, when the smaller, rapidly growing plants are more susceptible to herbicides. There is also less plant biomass early in the season, so when the plants die and decay, there is less chance that they will affect the water quality. Conversely, if the treatment occurs too early in the year, plants in deeper water that have not yet appeared may be missed by the treatment. In Lake Stevens, milfoil is actively growing by late April, and herbicide treatments should be initiated by mid to late May for optimal performance.

It is recommended that residual triclopyr concentrations be measured at regular intervals for 4 months following the initial treatment. It is important to measure triclopyr concentrations to gain an understanding of how the chemical dissipates and degrades and moves in Lake Steven's environment; which will help to refine any future application strategies. In addition, information on residual triclopyr can be used to evaluate whether/when residents may safely use lake water for irrigation. (Although the label irrigation restriction is 120 days, when levels drop below 1 part per billion, it is considered safe to irrigate.) Samples should be collected from four areas in the lake and analyzed for triclopyr every 2 weeks, beginning 20 days after the initial treatment. Collection and analysis may cease after concentrations are below 1 part per billion at all four sites. The cost of measuring triclopyr concentrations is about \$100 per sample. The first year budget assumes \$5,000 for triclopyr concentration monitoring. This estimate includes analytical, labor, and shipping costs.

Year 2

The actions taken in year 2 will be largely dependent on the success of the first year's treatments. A scuba diver survey designed to thoroughly inspect the entire littoral zone should be conducted in late May. It has been assumed in the cost estimate that these surveys will require 4 days for two professional divers. The divers will map surviving or new patches of milfoil with a GPS. The results of their survey will guide the Plant Control Advisory Committee's recommendations in the selection of appropriate treatment actions.

It is expected that triclopyr will provide a very high level of control during the first treatment. Ideally, most of the littoral zone will be milfoil free and any remaining milfoil will exist as isolated, readily treatable patches. In this case, targeted applications of triclopyr will be used to eliminate these patches. In a worst case scenario, there may only be a few surviving plants but they would be scattered throughout the lake. In this example, it would be inefficient to perform targeted spot treatments, and the whole littoral zone of the lake would need to be re-treated. The budget for year 2 is based on primarily relying on targeted applications.

A second scuba diver survey should be planned for late July or early August. As with the previous dive, the purpose will be to map the locations of surviving milfoil plants. Efforts should be taken to remove these plants either by hand pulling or more targeted triclopyr applications before fall. Milfoil plants auto-fragment (break apart) in September and October. Removing the plants in the late summer before they fragment, greatly reduces the chances that their fragments will spread and colonize new areas.

Years 3-10

The focus of years 3 through 10 of this treatment plan is early detection followed by appropriate and immediate response. Both of these aspects (detection and response) are vital to maintaining and furthering the gains made by the aggressive treatments of years 1 and 2. Continued herbicide treatments will likely be necessary in the first few years following the initial treatment(s). As the milfoil population is reduced, physical techniques may become more viable. Small patches less than 50 square feet can be hand pulled by a team of two divers in about an hour (Josh Wozniak, personal communication). Bottom barrier can reasonably be installed over milfoil patches up to 1,500 square feet.

Each year in late May, a scuba diver team will survey the entire littoral zone of the lake. The divers will hand pull isolated plants if there are only a few, but primarily their task will be to map the locations of milfoil or other invasive plants. The locations of any milfoil plants or fragments identified will be recorded using a GPS unit. Special care will be taken in the following year surveys to revisit the areas where milfoil was found to ensure that it is not taking hold. Based on the results of the diver survey, the Plant Control Advisory Committee will recommend the best course of action and most appropriate treatment strategies.

Annual diver surveys may indicate a range of plant growth scenarios:

- Only a few isolated plants or small patches of milfoil
- Isolated plants or small patches throughout the lake
- Several large patches

Decisions for treatment will be based on these distribution characteristics. Small patches or many isolated plants may be best handled through an additional day or two of diver hand pulling. Larger or dense patches would be re-treated with triclopyr while small dense patches may be appropriate for bottom barrier use.

Triclopyr applications require less effort than some of the physical methods for removing the remaining patches of milfoil. However there are a few issues that may outweigh the benefits. These issues are:

- Continued triclopyr use goes against the goal of minimizing herbicide use.
- The cost per acre for herbicide application is much higher for small areas due to fixed permitting, labor, travel, and notification costs.
- Even treating small areas may trigger the 120-day irrigation restriction.

As more plant control options become feasible, the Plant Control Advisory Committee will need to recommend the management strategies best suited to the immediate management needs. To accomplish this effectively, communication among the dive teams, herbicide applicators, and Plant Control Advisory Committee, and city staff will be crucial.

It is important to recognize that maintaining eradication will be an ongoing effort. Even after milfoil appears to be eradicated, the chance of re-infestation remains high. Living milfoil fragments transported by contaminated boats, or isolated plants that somehow escaped treatment have the potential to start the cycle of milfoil infestation all over. Annual “search and destroy” efforts need to be undertaken to ensure that any re-introduction of milfoil does not get out of control.

Other Considerations

While milfoil is the focus of this management plan, other noxious weeds (fragrant water lily and curly leaved pondweed) have been identified in the lake. These plants are not expected to reach problematic levels based on their presence in other lakes in the region. However, they should be monitored closely as the plant community in Lake Stevens changes (i.e., as milfoil is eradicated). The annual surveys for milfoil will be a useful tool in documenting the any changes in the water lily and curly leaved pondweed populations. Should these plant species become out of balance with the native plant population, prompt actions should be taken to control their spread.

Water lilies are most effectively controlled with targeted foliar applications with the herbicide glyphosate. There are no timing restrictions for the use of glyphosate in salmon-bearing lakes so treatment can occur when floating leaves occur on the water’s surface. It may be beneficial to only treat only a small area each season, as this prevents floating islands of sediment and dead vegetation from forming. Additional information on glyphosate is contained in Appendix D.

Curlyleaf pondweed can be eliminated with the herbicide fluridone. Fluridone is a systemic herbicide that kills the plants and its roots. Fluridone needs to contact the plants for a long time to be effective. Therefore, repeated applications at very low doses, is the preferred application method. Since its effectiveness is affected by dilution and water currents, it can be beneficial to isolate the treatment area such as with the use of geotextile curtains. Depending on the extent of curly leaved pondweed growth it may be best to treat the whole littoral zone with fluridone to

maximize the effectiveness of the treatments. Fluridone is also highly effective against milfoil, so if it were used to control curly leaved pondweed, it would also help control any remaining or new populations of milfoil.

The herbicides diquat and endothall have also proven to be effective in reducing curlyleaf pondweed. Although they are both contact herbicides (only kill above ground portion of the plant), when applied during the early spring they can inhibit turion formation (Poovey et al. 2002). By interrupting the plant's turion cycle, the plants primary reproductive method, over a period of several years, curlyleaf pondweed numbers can be greatly reduced. Diquat and endothall are both subject to WDFW salmon timing windows. Because these herbicides must be applied early in the spring to provide effective control, prior to the July 15 salmon timing window, a special permit would need to be obtained from WDFW to allow application of the herbicide outside of the timing window. Despite this consideration, diquat and endothall should be considered as a viable option should curlyleaf pondweed control become necessary.

The heavy recreational use of Lake Stevens makes it very susceptible to introductions of other invasive species. A search for other invasive plants (such as Brazilian elodea and hydrilla) should be included as part of the annual milfoil survey. Early detection and action to eliminate new invasive plants saves money, time, and allows for simpler, less impactful, control techniques to be used.

Milfoil and other noxious aquatic plants are not currently present in Stitch Lake (Gene Williams, personal communication). If noxious aquatic plants did become established in Stitch Lake, it could serve as a weed introduction vector for Lake Stevens because of its close, upstream proximity. Stitch Lake is less prone to non-native aquatic plant invasions because it does not have a public boat launch however, annual surveys of Lake Stevens should also incorporate an inspection of Stitch Lake. If noxious aquatic plants are identified, immediate action should be taken to eradicate the plants from Stitch Lake. In this event, the Aquatic Plant Control advisory committee and City of Lake Stevens Staff will adapt the control strategy presented above to include treatment of Stitch Lake. Stitch Lake would be covered under the same pesticide application permit as Lake Stevens. Likewise, the general WDFW HPA would also apply.

SENSITIVE SPECIES ASSESSMENT

Washington State Department of Natural Resources (WDNR) was contacted and no sensitive plant species were identified within the project area (Appendix E). Several state listed sensitive species of birds and fish are known to be present in and around Lake Stevens.

- Bald eagles
- Blue herons
- Kokanee salmon
- Loons
- Mountain whitefish

The sensitive fish species are not expected to be directly impacted by triclopyr treatments, due to triclopyr's low toxicity to fish. Herbicide fact sheets and labels with detailed toxicity information are included in Appendix D. The largest potential expected impact to fish is temporary loss of

habitat due to the elimination of milfoil. The milfoil in Lake Stevens has undoubtedly degraded the shallow water habitat used by juvenile fish as it has replaced the native plant community. However, because it is the only plant species in many areas, it provides most of the available habitat. When the milfoil is removed, it may expose juvenile fish to more predation by birds and large predatory fish. In the long run, the elimination of milfoil and subsequent replacement by healthy populations of native plants should significantly improve shallow water habitat for juvenile fish.

None of these species of birds listed above are expected to be impacted by triclopyr usage. For osprey, loon, and eagles the concern would be whether their food supply (i.e., fish) would be directly affected or indirectly affected through accumulation of the chemical in their organs or tissues. The risk assessment for triclopyr and the other chemicals mentioned in this document indicates that is not a concern.

PLANT CONTROL ADVISORY COMMITTEE

Decisions will need to be made annually about aquatic plant control activities that will require the time and attention of lake residents. Therefore, it is recommended that an aquatic plant control advisory committee be formed. This committee would have the following responsibilities:

- Review annual plant survey information and track potential problem areas. Make recommendations on next steps. Next steps might include contacting an herbicide applicator, requesting additional diver time for hand pulling, or ordering and installing bottom barrier.
- Review plant control activities. Provide documentation that includes information on what activities were implemented each year; how many acres of what kind of plants were controlled; what was used to control them (e.g. what chemical at what concentration, how was it applied and the rate of application) and the costs of the different programs (e.g. surveys and applications).
- Provide information to lake residents and act as spokespeople for answering questions on plant control problems and supporting long-term implementation of this plan.
- Provide general lake stewardship information to lake residents. This might include providing education on proper lakeside property management and information on avoiding introduction of invasive plants. For example, signs may be placed at boat launches to educate systems on proper boat cleaning techniques to avoid transporting non-native plants.
- Train one or two members of the committee to identify the key invasive aquatic plants of concern in Washington, so that lake residents have a resource to take plants to for identification.
- Remind lake residents each year about the importance of NOT removing milfoil on their own and the dangers of creating fragments that will lead to recolonization.

GENERAL CONSIDERATIONS AND PERMITTING

Information on all techniques available to manage aquatic plants is presented in Appendix B. Much of the information in this appendix is excerpted from the *Citizen's Manual for Developing Integrated Aquatic Plant Management Plans* (Ecology 1994), the Supplemental Environmental Impact Statement for Ecology's Aquatic Plant Management Program (Ecology 2001) and Ecology's Aquatic Plant Management website: <http://www.ecy.wa.gov/programs/wq/plants/management/index.html>.

The control strategies above do not legally preclude lake residents from implementing small-scale physical control methods (e.g., raking). However due to the risk of milfoil fragmentation these techniques are highly discouraged. A specific venue for helping homeowners deal with their immediate plant management needs should be developed by the Plant Control Advisory Committee. Lakefront homeowners also need to be educated on how their personal actions can impact the entire lake. More details on education are provided in the Public Education Program section below.

All aquatic plant control activities require a permit from one or more State agencies. Detailed permitting information for controlling aquatic plants is provided in Appendix D. All manual, mechanical, and physical techniques require issuance of a WDFW Hydraulic Project Approval (HPA). Permit guidance in the "Aquatic Plants and Fish" pamphlet (WDFW 1998) was developed in recognition of the importance of controlling aquatic noxious and nuisance weeds, the need to protect the aquatic resource and to facilitate the approval process for HPA projects. Application of chemicals to the State waters to control algae or aquatic plants must be covered under a NPDES permit. An NPDES permit has been issued to the Washington Department of Agriculture for control of State-listed noxious weeds and individual treatments must request coverage under this permit.

FUNDING

City staff and the lake stakeholders group fully understand that implementation of this plan will require a long term funding source. Although funding details have yet to be developed, the City and County already have a solid track record of funding lake activities as evidenced by the long term funding for maintenance of the lake aeration system. There is also a local stormwater utility district that represents a potential funding mechanism.

PUBLIC EDUCATION PROGRAM

The public education program for Lake Stevens consists of an invasive plant prevention and detection program, volunteer patrols, and lakeside stewardship education.

Invasive Plant Prevention and Detection Program

There will always be a potential for reinfestation by milfoil and the potential for introduction of other invasive plants. Other non-native, highly invasive plants of concern include: Brazilian

elodea (*Egeria densa*), Parrotfeather (*Myriophyllum aquaticum*), Hydrilla (*Hydrilla verticillata*), and Fanwort (*Cabomba caroliniana*). The focus of control efforts for non-native plants is a prevention and detection program.

To be effective, this program should include both a source control component and a detection program. The objective of source control is to prevent non-native plants from entering the lake. The public boat launches represent areas where there is a high potential for introduction or re-introduction of invasive plants. It is recommended that the lake community institute some public information campaign for opening day of the fishing season and holiday weekends. Simply having volunteers hand out exotic plant identification cards for a few hours and help with boat and trailer checks, will emphasize the importance of the effort and remind boaters of their responsibility to check equipment. The Plant Control Advisory Committee should also install permanent signs at the boat ramps to educate citizens in the prevention of invasive species transport.

Early detection is the next step to protect against new infestations. While an infestation is still relatively small the options for control are much less expensive. Early detection requires annual surveys to assess the plant community. The main purpose of these surveys is to search for milfoil and any other exotic plants. However, it will also provide a means for monitoring the native submerged plant community. There are also early infestation grants available through the Department of Ecology that could be obtained if a plant that does not currently exist in the lake appears.

All diver surveys should be done in such a manner as to thoroughly cover the lake bottom from the shoreline to depths of 20 feet. The survey report should describe the survey method in detail and must include production of a GIS based map that shows the locations of all invasive plants or patches of plants and a calculation of the acreage under each plant type. Actual GPS coordinates for all invasive plants identified for control should also be provided.

The primary advantage of controlling small infestations is that it reduces the chance that a large area would need to be controlled by a more intensive and expensive technique. A drawback of controlling small infestations is the high costs associated with diver surveys and hand pulling. However, in the case of Lake Stevens, annual surveys will be required to meet the primary goal of milfoil eradication. Therefore there are no additional costs associated with this plan element unless another invasive plant is detected. If another invasive plant is found, immediate action should be taken and a second dive should be planned for later in the same year to insure there were no surviving colonies.

Volunteer Patrols

After the initial herbicide treatment, whenever a lake resident finds what they believe to be Eurasian watermilfoil they should mark the spot and immediately contact the City or a member of the Aquatic Plant Control Advisory Committee to confirm identification and to have the plant properly removed. All floating milfoil fragments should be immediately removed and disposed of well away (at least 200 feet) from the lake shore.

One of the more difficult aspects of this plan will be convincing lake residents to not attempt milfoil removal around their docks and shoreline. For the past few years, lake residents have

been encouraged to rake or pull milfoil themselves. As no other treatment measures were being enacted at this time, this was the best way to maintain usability. Now that steps to eradicate milfoil are being taken, physical removal by residents will actually hinder the progress of the control plan. Physical removal of milfoil can cause the plants to break apart. Each fragment that breaks free has the potential to start a new milfoil colony. It is crucial that only people trained in proper milfoil removal techniques attempt to remove the plants.

It is recommended that one or more lake residents learn to identify the handful of invasive submerged plants that are problems in this State. These people can then be a resource to other lake residents who may not be sure of plant identification. All information on where plants are found or suspected should be conveyed to one person who can track this information and relay it to dive teams and applicators.

It is also recommended that volunteers periodically patrol the areas near previously identified patches of the milfoil and around all boat launches a few times each summer, and remove any floating fragments found and identify locations of remaining rooted plants.

Lakeside Stewardship Education

Each lakeside resident should be educated about how to reduce the amount of pollutants entering the lake from their property, and about things they can do to help retain a complex, diverse, and therefore healthier lake environment. The properties located directly adjacent to the lake have the greatest potential for adversely impacting the lake, since pollutants generated on these properties can more easily reach the water.

Lakeside property owners should be provided with information about problems associated with typical urban type landscapes around lake shorelines. This should include information on the drawbacks of bulkheads and using ornamental turf (lawns), and the benefits of adding shoreline plants and diversified lawn plantings, which create habitat structure for birds and wildlife.

Some important considerations for proper stewardship of lakeside property are described here. Informative brochures or newsletter articles should be used to educate lakeside property owners about best management practices (BMPs). Some examples of stewardship ideas include:

- Limit turf and landscaped areas to no closer than 25 feet from the shoreline. Native plants and grasses should be considered for landscaped areas to decrease the amount of fertilizers, pesticides, and other pollutants used.
- Establish a "pollutant free zone" within 50 feet of the shoreline. Try to keep all pollutants; gas for boats, painting projects, landscape fertilizers and poisons, and etc. away from this zone.
- Plant a shoreline buffer of shrubs and tall grasses, preferably native species. This one small activity will cause multiple environmental benefits. If properly designed it will keep geese and other waterfowl from moving onto lawn areas. The vegetation will help filter out pollutants such as fertilizers from landscaped areas before they reach the lake. It will provide protection from shoreline erosion, and it will provide habitat for the many wildlife species that utilize nearshore areas.
- Preserve natural "structure" such as fallen trees and boulders that exists along the shoreline and in the shallow nearshore area. If a tree along the shoreline finally falls in,

leave it. Add structure in the form of treetops, twig bundles, and rocks to diversify and naturalize the nearshore area and attract more fish and wildlife.

- Avoid the use of bank armor such as bulkheads and riprap.
- Allow emergent vegetation, and other plants to colonize some portion of waterfront area.

PLAN ELEMENTS, COSTS, AND FUNDING

The table below includes the estimated costs for implementing this plan over the next 10 years. The \$140,000 first and second year treatment costs are based on a cost of \$700 per acre (Terry McNabb, personal communication), and an estimated treatment area of 200 acres. The entire 200 acre treatment area may not need treatment in the second year. This cost scenario represents a worst case scenario where plant regrowth cannot easily be controlled by smaller scale treatments. By the third year and beyond, it is difficult to know what actions might be most reasonable or cost-effective. For these years, a contingency fund of \$35,000 to \$50,000 has been identified to cover either additional spot treatments of herbicide, additional diver time for hand removal, or purchase of bottom barrier.

A thorough diver survey will be required every year. It is critical to the goal of attaining near eradication of milfoil and to preventing the invasion of other noxious aquatic plants. The survey costs in Table 2 are based on the assumption that it would take a 2-person dive team 4 days to thoroughly search the lake for milfoil.

Table 2. Lake Stevens IAVMP Estimated 10-Year Budget.

	2011	2012	2013	2014	2015	2016	2017-2020	10 Year Total
Initial Treatment (200 acres)	\$140,000							\$140,000
Survey	\$16,000	\$32,000	\$16,000	\$16,000	\$16,000	\$16,000	\$64,000	\$176,000
Notifications and Signage	\$5,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$8,000	\$23,000
Herbicide Residue Testing	\$5,000	\$1,000	\$1,000	\$1,000				\$8,000
Public Education	\$5,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$8,000	\$23,000
Contingency Budget		\$50,000	\$35,000	\$35,000	\$35,000	\$35,000	\$140,000	\$330,000
Estimated Annual Cost	\$171,000	\$87,000	\$56,000	\$56,000	\$55,000	\$55,000	\$220,000	\$700,000

The total maximum cost over a 10-year period is estimated at \$700,000 or an average of about \$70,000 per year.

IMPLEMENTATION AND EVALUATION

The following is a step-by-step approach to implementation of this plan:

Step 1) *Set up a Plant Control Advisory Committee*

Set up a committee of Lake Stevens residents that will provide recommendations in the development and implementation of the plan. Many of the tasks this committee will need to carry out are described in the plan under the "plant control advisory committee" section.

Step 2) *Apply for a Plan Implementation Grant*

Grants for up to \$75,000 are available through the Ecology Aquatic Weeds Program for implementation of approved Aquatic Plant Management Plans. Applications are due to Ecology by the end of October.

Step 3) *Select an Herbicide Applicator*

A bid should be prepared and an applicator selected for the triclopyr application. The bid should be prepared for release by February or March of 2011, allowing 2 weeks for bidders to respond, and time for processing of the permit, which is expected to take longer under the new permit. The bid should include preparation of permit applications and application costs, and all notification and posting requirements associated with the applications.

Step 4) *Initiate the Treatment Plan*

The first herbicide application should occur in May 2011. Ensure that herbicide application permit requirements are met and the application is carried out properly. In some lakes, residents take an active role during the application. On the day of the application, they meet the applicator at the site to review the application map and quantify herbicide use; some even follow the applicators to insure proper areas are being treated. These steps are taken to circumvent future questions from lakeside residents about the accuracy of the treatment.

Step 5) *Conduct Annual Evaluations*

Complete a written annual evaluation for the lake records that describe what elements of the plan have been implemented, relates the existing plant community to established goals, and makes recommendations for the next year's activities.

It is important that there is an established process for periodic evaluation of this plan and determination of whether it is meeting stated goals or whether the goals have changed. This evaluation should be done every year. It should begin with a description of which elements of the plan have been fully implemented, which have not, and why. It should also include a summary of the plant monitoring results, both those obtained by volunteers and those by professionals. These results should be used to aid in the determination of whether goals have been met.

The community should also be asked for input on their satisfaction with plant conditions. This information should be used to decide on the following years activities; does an herbicide treatment need to be scheduled; are physical techniques capable of addressing the problem; have any other invasive plants been identified? Is it necessary to implement a plan to control water lilies or pondweed? Over the long term, adequate annual evaluations can make the difference between project success and failure.

Step 6) *Institute a Long-Term Program*

Because of the high risk of re-infestation, survey and removal efforts will need to continue indefinitely, beyond the 10-year outline described in this plan. Eventually, it may be beneficial to develop multiple-year contracts with surveyors and herbicide applicators. This could be more cost-effective and also help ensure some consistency in methodology. If volunteers or city staff are available, it may be possible, over time, to have many of the plant management activities carried out by them.

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Appendix A

Public Meeting

Announcements and Sign in

Sheets



NEWS RELEASE

Date: 4 August 2010

City Contact: Mick Monken

Milfoil In Lake Stevens – Public Meeting

As early as April of this year, there were concerns with Milfoil growth becoming visible within Lake Stevens. The warm winter and spring allowed for this non-native invasive freshwater plant to get an early start. While most of the growth is still under the surface of the water, some areas the plant has reached the surface. In July a full lake investigation was conducted to assess the severity of the Milfoil condition in Lake Stevens. This was performed with divers that explore around the shallow waters near the shoreline of the lake. It was found that nearly all of the lake's shallow areas had some level of Milfoil. The densest blooms were located around the northwest and southeast sections of the lake shoreline.

The City, County, and State are working together in the development of an aquatic weed management plan. The major goal of this plan is to develop a long range solution to control the Milfoil growth to protect the quality of the lake. The plan will look at alternative, costs, and implementation options. The process will include working with a steering committee to develop a draft plan that will be presented to the public. Other efforts will include education to help in the management and control for interim and long term solutions. If you are interested in learning more, a public meeting will be held on Wednesday the 25th of August 2010 at 7:00 PM at the City's Community Center located at 1808 Main Street (south of City Hall).

Representatives from the City and County will be present.

Good Afternoon Committee Members,

We have a meeting next Wednesday, September 8 from 6 pm to 9 pm. We are meeting in a different location because we have a presentation on the milfoil issue. We are meeting at Lake Stevens Fire Station #82 at 9811 Chapel Hill Road. Directions are:

Directions to Station 82

Northbound I-5: From I-5 Northbound, merge onto US-2 East via exit 194 towards Snohomish/Wenatchee. Merge onto WA-204 East via the ramp on the left towards Lake Stevens. Turn right onto Hwy 9 North. Turn left onto Market Place. Turn right onto 99th. Turn right onto Chapel Hill Road. End at 9811 Chapel Hill Road.

Southbound I-5: From I-5 Southbound, take WA-521 exit 206 towards Lakewood/Smokey Point. Turn left onto WA-531/172nd St NE. Turn right onto Hwy 9 North. Turn left onto Market Place. Turn right onto 99th. Turn right onto Chapel Hill Road. End at 9811 Chapel Hill Road.

Herrera Consulting will be discussing the milfoil issue and Makers will be discussing the Cumulative Impacts Analysis. Also, staff will be covering an update of the grant project and schedule.

You will find attached an agenda, staff report for the milfoil presentation, and staff report and document for the Cumulative Impacts Analysis. Please review the information and be ready to discuss.

Please let me know if you will be unable to attend the meeting. Our next scheduled meeting is Tuesday, September 21.

September 21, 2010

Good Afternoon Committee Members,

We have finally set the Shoreline CAC meeting to discuss the Aquatic Plants Management options with Herrera, Inc. The Shoreline Consultants will not be at this meeting.

It is extremely important that everyone is present as you will be asked to select an option to be presented to the public for aquatic plant management. I know John Spencer will be unable to attend, but two other Councilmembers will be present.

I've attached two documents for your perusal. One is on the aerator in Lake Stevens (updated from the one I sent earlier) and the other on the environmental effects of herbicides, since we will probably be putting chemicals in the lake to control aquatic plants.

I will send additional information from Herrera, if available, about a week before the meeting.

Thank you, Karen Watkins

September 16, 2010

Good Afternoon Committee Members,

We have a meeting scheduled for this coming Thursday, September 30, 6 to 9 pm. It is at the Community Center at 1808 Main Street behind City Hall.

We will be discussing the Aquatic Plants Management Plan, not the Shoreline Master Program. Joy Michaud of Herrera, Inc. has provided the attached documents for your review before the meeting. They will be discussed at the meeting.

1. Table with various aquatic plant control methods
2. Goals and Problem Statement from last meeting
3. Three potential control strategies for Lake Stevens

Please let me know if you will be unable to make the meeting. It is very important to attend as you will be making a decision on which of the three strategies should be selected for presentation to the public at a public meeting. (I currently know John Spencer and Will Brandt will be unable to attend.)

Have a great weekend, Karen Watkins



NEWS RELEASE

Date: 18 October 2010

City Contact: Mick Monken, Director of Public Works

Lake Stevens' Eurasian Milfoil – City Council to Consider Eradication Measures

On October 25th, 2010, the Lake Stevens City Council will consider whether to accept the aquatic weed committee's recommendation to use a herbicide to eradicate the Eurasian Milfoil problem plaguing their Lake. The meeting begins at 7:00 PM at the Lake Stevens School District Educational Service Center located at 12309 22nd Street N.E., Lake Stevens. The public is encouraged to attend and comment.

This past summer, Lake Stevens has had a lake wide problem with Eurasian Milfoil. The condition was surveyed in July 2010 and about 75 percent of the lake was found to be infested. By September, nearly 100% of the lake shoreline was found to have some level of Milfoil growth. The City and County have been working in coordination to address this problem and with the help of a grant from the State Department of Ecology, is in the process of developing an aquatic weed management plan. A consultant, Herrera Environmental Consultant, was hired to prepare the plan. The goal of the aquatic weed management plan is to develop affordable and effective solutions for aquatic weed control that protect the beneficial uses and balance of life in the lake and the watershed.

An aquatic weed control committee was created to assist in the plan development, develop alternatives, and to make a recommendation for the Council. The alternatives considered were mechanical, biological, and chemical methods. The issue faced by the Committee was to develop a cost effective solution and that would eradicate the Milfoil. The findings were that the mechanical method was very costly, had only short term results, only address 20% of the affected area, and didn't eliminate the Milfoil. Biological would introduce non-native creatures into the environment, was also very costly, and did not eliminate the Milfoil. Using chemical was the most cost effective and the only method that could eradicate the Milfoil. The committee considered 7 different types of herbicide treatment and after some discussion, the decision was to recommend treatment using a herbicide product called Triclopyr. This product was selected because it only affects Milfoil and not the other aquatic plants, swimming could

be allowed after 24 hours of the application, would eradicate the Milfoil, and is approved by the State Department of Ecology.

As part of the plan development process, the Committee's recommendation was presented to the public for comments on October 14, 2010. The presentation was an overview of the process including the recommended treatment. At the conclusion of the meeting, it appeared that there was no opposition to the recommended herbicide treatment.

The recommended herbicide treatment is estimated to cost \$520,000 over a 10 year period. The highest portion of the cost, estimated at \$186,000, would occur in the first year. The initial treatment would involve the application of the herbicide over the entire Milfoil affected area in the first year then spot treatment thereafter. Each year an investigation would be performed to monitor and identify spot treatment areas. If the Council does decide to proceed with the implementation of a treatment in 2011, application would be planned for May/June 2011 but will be pending approval of the Department of Ecology and obtaining State permits. With the recommended treatment, results are expected to be visible within several weeks after the application.

**Lake Stevens Integrated Aquatic management Plan Steering
Committee Sign in Sheet**

Steering Committee meeting 1

Date	Person	Representing
9/9/2010	Tom Matlack	Lake Stevens Resident
9/9/2010	John Spencer	CH2MHill
9/9/2010	Neil Brauer	Herrera
9/9/2010	Joy Michaud	Herrera
9/9/2010	Gary Petershagen	SMP/Aquatic Committee

Steering Committee meeting 2

Date	Person	Representing
9/30/2010	Carl Johnson	Lake Stevens Park Board
9/30/2010	Kim Daughtry	Lake Stevens City Council
9/30/2010	Gary Petershagen	SMP/Aquatic Committee
9/30/2010	Joy Michaud	Herrera
9/30/2010	Dan Ansbauga	Planning Commission
9/30/2010	Neil Brauer	Herrera
9/30/2010	Mick Monken	Lake Stevens Public Works
9/30/2010	Gene Williams	Snohomish County SWM
9/30/2010	Tom Matlack	Lake Stevens resident
9/30/2010	Karen Watkins	Lake Stevens Planning Department
9/30/2010	Brent Kirk	SMP Committee
9/30/2010	Susanne Quigley	Lake Stevens City Council

Appendix B

Summary of Ecology Approved Plant Control Strategies and Their Appropriateness for Lake Stevens

PLANT CONTROL TECHNIQUES

Much of the information in this appendix is excerpted from A Citizen's Manual for Developing Integrated Aquatic Plant Management Plans (WDOE, 1994), the Supplemental Environmental Impact Statement for the Department of Ecology's Aquatic Plant Management Program (WDOE, 2001c), the King County Regional Milfoil Plan: http://your.kingcounty.gov/dnrp/library/water-and-land/weeds/BMPs/Milfoil_Myriophyllum_control.pdf, and the Department of Ecology's Aquatic Plants and Lakes website: <http://www.ecy.wa.gov/programs/wq/plants/management/index.html>.

PHYSICAL/MECHANICAL METHODS

Mechanical Harvesting

Harvesting is a way to mechanically remove milfoil in order to provide open areas of water for recreational activities and navigation. Harvesting immediately removes surfacing milfoil mats, but since the cut plants grow back (sometimes within weeks), the same area may need to be harvested twice or more per growing season. Harvesting machines (harvesters) are specialized underwater mowing machines specifically designed to cut and collect aquatic plants. Cut plants are immediately removed from the water via a conveyer belt. The cut plants are stored on the machine until they can be off-loaded and disposed of properly. Several manufacturers sell various sizes and models of machine, and there are firms that contract for harvesting operations. More information about harvesting is available at the following web address: <http://www.ecy.wa.gov/programs/wq/plants/management/aqua026.html>

Waterbodies suitable for harvesting programs:

Waterbodies suitable for harvesting programs include larger lakes (about 100 acres or more), and rivers with widespread, well-established milfoil populations, where milfoil eradication is not an option. Since on-going harvesting operations are expensive, having a large lake association, residential community, or a motivated local government to share the harvesting costs is crucial.

Special considerations:

Harvesting is not recommended in waterbodies with early infestations of milfoil since the resulting fragments are never completely contained and harvesting may increase the spread of milfoil throughout the waterbody. Because harvesting is a whole-lake activity it should be conducted under the direction of an integrated aquatic vegetation management lake plan. Factors to consider when designing a harvesting program include:

- Lake surface area, width, and depth;
- Vegetated acres;
- Bottom contours and bottom obstructions such as stumps, rocks, other debris;
- Traffic patterns,
- Prevailing winds;
- Harvester launching and off-loading sites;
- Shoreline development; and

- Sensitive areas (critical habitat).

A reliable funding source, such as a Lake Management District or a committed local government, is necessary to provide funding either to purchase and operate a harvester or to contract for harvesting on an annual basis. In at least one jurisdiction (Skagit County, Washington), the County trained volunteers to operate the County-owned harvester to remove milfoil on local lakes. However, liability may become an issue with volunteers using harvesters since harvesting machines have been known to capsize when improperly filled or overloaded.

A lake committee and/or local government staff identifies acreages and areas to be harvested within the lake. Priorities may be determined by who funds the program. For example, a local government will be more interested in harvesting public areas, whereas the lake group may be interested in harvesting the areas in front their homes. In general, high use areas such as public parks, community access points, navigation channels, public boat launches, and water ski lanes receive priority for clearing. Because harvesters are large machines and are difficult to maneuver near-shore between and around docks, in at least one harvesting program (Long Lake, Thurston County), harvesting was limited to areas outside of the docks. Individual homeowners, at their discretion, were considered responsible for removing plants growing between the end of the dock and their shoreline.

Prior to harvesting, machinery launch sites (a paved ramp with deep water is best), and plant disposal off-loading sites need to be identified. A summer harvesting schedule must be developed. If harvesting services are contracted, bid documents and a contract need to be prepared.

Description of a harvesting project:

Harvesting starts when plants have neared or approached the water surface. The harvester's cutting head is lowered into the water and the harvester moves forward, cutting and collecting plants as it advances. Harvesters vary in size and capability. Most cut plants about five feet below the water and in a swath between five and ten feet wide. Bigger, faster machines with larger cutting heads and holding capacities may be more efficient, but are also less maneuverable. Depending on time of year, weather, and depth of cut, the same area may need to be harvested again in a few weeks.

The cuttings are collected on a conveyer belt and deposited in a holding area on board. Although the harvester collects most plant materials as it operates, inevitably some fragments are missed. Not overloading the carrying capacity of the harvester helps to keep plant fragments to a minimum. Along with plants, the harvester also inadvertently collects small fish (some are able to escape from the conveyer belt) and invertebrates.

When the plant storage area is filled, the harvester must off-load the cut plants. Plants can be off-loaded to either a barge stationed offshore or to a trailer or dump truck. These plants may be used as compost or disposed of in a landfill. As the distance from the work area to the off-loading site increases, the time spent on plant disposal activities can exceed the time spent cutting. This can add greatly to the duration and expense of the project and is a critical limitation to some harvesting projects. The plant density and machine specifications will also determine how often the harvester needs to off-load the cut plants.

Delays in the harvesting schedule can result from high winds, thunderstorms, and mechanical failure. Unscheduled maintenance or machine breakdowns can also result in lost harvesting time.

Complaints about harvesting have included reports by homeowners that plant fragments wash up more frequently on their beaches after harvesting. Homeowners may also report that their neighbor's property was harvested sooner or the job done more thoroughly than at their own property. It is important to establish some clear guidelines and policies to help make decisions and to settle disputes.

General impacts of harvesting:

While some people view harvesting as an excellent non-chemical control method for milfoil, others scoff at the waste of money to "merely mow the weeds." Harvesting plants has the added benefit of removing nutrients from the waterbody that are tied up in the plant biomass. Because only the top part of the plant is removed, the rest of the plants remain for habitat and sediment stabilization.

Harvesters are large machines and occasionally hydraulic fluid or fuel are leaked or spilled. The operator should have a spill plan and containment equipment available at all times. When working in shallow water, the propulsion system or the cutter head can sometimes churn up the sediment creating turbid water. Significant numbers of fish can be removed from a waterbody during harvesting activities as fish become collected along with the cut plants (Mikol, 1985). These are often juvenile fish, because larger fish can more easily avoid the harvester. Long term milfoil harvesting programs in Washington state include; the Columbia River, Lake Washington, and Green Lake. There is also a program aimed at native plant control on Long Lake (Thurston County).

Appropriateness for Lake Stevens:

Mechanical harvesting may be a viable option for managing milfoil in Lake Stevens. Though harvesting is only a control method, and will not significantly reduce the number of milfoil plants, it may be more palatable to residents who are concerned about the use of chemical control methods. Harvesting may be a reasonably cost effective way to maintain the recreational usability of selected areas of the lake. Mechanical harvesting is expensive on a cost per acre basis (\$250-800) and often requires repeated harvestings throughout the growing season. Lake Stevens' large size and widespread milfoil infestation probably dictate that only the most critical recreational areas (i.e. swimming beaches and boat launches) could be managed by harvesting.

References:

Mikol, G. F. 1985. *Effects of harvesting on aquatic vegetation and juvenile fish populations at Saratoga Lake, New York*. Journal of Aquatic Plant Management. 23: 59-63.

Your Aquatic Plant Harvesting Program: A How-To Field Manual. Produced by the Wisconsin Lakes Partnership- University of Wisconsin-Extension, Wisconsin Association of Lakes, and Wisconsin Department of Natural Resources. Publication FH-205-97

Rotovation (underwater rototilling)

A rotovator is a barge-mounted rototilling machine that lowers a tiller head about eight to ten inches into the sediment to dislodge milfoil root crowns. The mechanical agitation produced by the tiller blades dislodges the root crowns from the sediment and the buoyant root masses float to the water surface. Since the entire plant is removed, plant biomass remains reduced in the treatment area throughout the growing season and often longer. Rotovation often provides two full seasons of control (Gibbons et. al, 1987). Unlike harvesters, rotovators do not have the capability to collect the plants

More information about rotovation is available at the following web address:

<http://www.ecy.wa.gov/programs/wq/plants/management/aqua027.html>

Waterbodies suitable for rotovation programs:

Rotovation is a way to mechanically remove milfoil to provide open areas of water for recreational activities and navigation. Waterbodies suitable for rotovation include larger lakes or rivers with widespread, well-established milfoil populations where milfoil eradication is not an option. Since on-going rotovation programs are very expensive, having a large lake population or a motivated local government to share these costs is crucial. Because rotovation is expensive and multiple permits are needed, rotovation has not become a wide-spread milfoil control activity in Washington or elsewhere in the United States.

Special considerations:

Rotovation is not recommended in waterbodies with early infestations of milfoil since fragments are created and rotovation may increase the spread of milfoil throughout the waterbody. Because rotovation creates turbidity, rotovation may not be appropriate in salmon-bearing waters, although sometimes Fish and Wildlife staff are able to provide windows of time when rotovation activities will have the least impact on fish. Because rotovation and the resultant turbidity may impact the entire waterbody, it should be conducted under the direction of an integrated aquatic vegetation management plan.

Factors to consider when designing a rotovation program include:

- Waterbody surface area, width, and depth;
- Vegetated acres;
- Bottom contours and bottom obstructions such as stumps, rocks, other debris;
- Traffic patterns,
- Prevailing winds;
- Rotovator launching and off-loading sites;
- Sediment type;
- Shoreline development; and
- Sensitive areas (critical habitat).

A waterbody committee and/or local government staff identifies acreages and areas to be rotovated. Priorities may be determined by who funds the program. A local government will be more interested in rotovating public areas, whereas local residents may be interested in rotovating areas in front their homes. However, generally high use areas such as public parks,

community access points, navigation channels, public boat launches, and water ski lanes receive priority. Sometimes rotovators can be used to create fishing lanes in dense beds of milfoil to provide better fishing access to anglers.

Prior to rotoation, machinery launch sites (a paved ramp with deep water is best) need to be identified. Since rotovators do not collect plants as they work, a method for removing plants from the water should be developed. This may involve having a harvesting machine follow behind the rotovator to collect plants or hiring people to rake plants off beaches. When Pend Oreille County rotovates milfoil in the Pend Oreille River, they begin at the milfoil bed furthest upstream. The plants are then carried downstream and get caught up on the remaining dense milfoil beds. Their rotovator also has a clam rake attachment that can be used to pick up the plants and place them on-shore. This removal technique is acceptable on the Pend Oreille because there are many uninhabited shoreline areas. This would not be suitable in well-populated bodies of water.

Description of a rotoation project:

During a rotoation project, the rotovator tilling head is lowered into the sediment and power is applied. The rotating head churns into the sediment dislodging milfoil root crowns and plants, and a plume of sediments. The rotoated plants eventually sink or wash up on shore and the sediments gradually settle from the water. Canadian plant managers have recorded milfoil stem density and root crown reductions of better than 99 percent after rotoation test trials (British Columbia Ministry of Environment memo dated 1991). Where repeated treatments have occurred at the same site over several consecutive years, treatment intervals may extend longer than two years (Gibbons, et. al, 1987).

If rotoation services are contracted, bid documents and a contract need to be prepared, but there are few, if any, contractors offering these services. In a few waterbodies such as in the Pend Oreille River, rotoation may be performed year-round. In most waterbodies, timing is dependent on fish windows. Washington Fish and Wildlife does not want rotoation activities to take place when fish are spawning or juvenile salmon are migrating through the waterbody.

For efficacy of milfoil removal, it's best to begin operations in early spring and resume again in the fall. Rotoation is less effective in the summer when the long milfoil plants wrap around the rotoating head, slowing down the operation. If rotoation is done during the summer, it is more efficient to cut or harvest the plants beforehand. Weather creates winter rotoation delays, although it is possible to rotoate throughout the winter months (as long as the waterbody doesn't freeze). Delays in the rotoation schedule can result from high winds, thunderstorms, freezing water, and mechanical failure. There is a lot of maintenance and some down time on machinery working on the water.

Complaints about rotoation include increased plant fragments washing up along shorelines, broken water intakes, and homeowners perceiving that their neighbor's property was rotoated sooner or more thoroughly than their own property. It is important to establish some clear guidelines and policies to help make decisions and to settle disputes.

General impacts of rotoation:

Rotovators stir sediments into the water column. In addition to the sediments, buried toxic materials and/or nutrients may be released. Generally turbidity is short-term and the water returns to normal within 24 hours, but the length of time that sediments remain suspended depends on sediment type. Plants and root crowns are uprooted from the sediment and unless a plant removal plan is in place, these plants will either sink or be washed on shore. Rotovation appears to stimulate the growth of native aquatic plants. Whether this is due to the removal of milfoil, the action of the rotovator stimulating seed or propagule germination, or a combination of these factors is not known. Rotovators are also large machines with hydraulic systems and fuel that occasionally leaks or is spilled. The operator should have a spill plan and containment equipment on board for emergency use.

In 1987, Ecology conducted an evaluation of rotovation in Lake Osoyoos. This lake was chosen because it has a history of mining and agricultural use and therefore might represent a "worst case" scenario in terms of the potential for release of contaminants from sediment. The objectives of the study were to document effectiveness of rotovation by measuring changes in milfoil stem densities before and after treatment, and to assess impacts of rotovation on selected water quality parameters, benthic invertebrates, and the fisheries. Although the rotovator malfunctioned during the test (the hydraulic system driving the rototiller was not functioning properly), the results were consistent with data collected by the British Columbia Ministry of the Environment of sites rotovated by a fully operating rotovator. During the Lake Osoyoos rotovator test, rotovation appeared to have little impact on fish, water quality, or benthic invertebrates. However during this test, milfoil stem densities were not reduced to the extent that should have occurred had the machinery been operating properly. Although the results indicated only short-term impacts associated with rotovation, the test was faulty and it is difficult to draw firm conclusions. This study was not repeated using a fully functioning machine

Appropriateness for Lake Stevens:

Rotovation is not a viable option for managing milfoil in Lake Stevens. Though it can significantly reduce the amount of milfoil in treated areas for successive seasons, the area that needs to be treated in Lake Stevens is simply too large to be treated cost effectively by rotovation.

References:

Gibbons, M.V., Gibbons, H.L., and Pine, R.E. 1987. *An evaluation of a floating mechanical rototiller for Eurasian watermilfoil control*. Department of Ecology. Publication Number 87-17.

Diver Dredging

Diver dredging is a mechanical control technology for milfoil removal that was pioneered by the British Columbia Ministry of Environment. During diver dredging operations, divers use venturi pump systems (small gold mining dredges) to suction plants and roots from the sediment. The pumps are mounted on barges or pontoon boats and the diver uses a long hose with a cutter head to remove the plants. The plants are vacuumed through the hose to the support vessel where the plants are retained in a basket and sediment and water are discharged to the waterbody. Often a silt curtain is deployed around the treatment site to control turbidity. To learn more about diver dredging, see the following web page:

<http://www.ecy.wa.gov/programs/wq/plants/management/dredging.html>

Waterbodies suitable for diver dredging:

Sites suitable for diver dredging include lakes or ponds lightly to moderately infested with milfoil. Because diver dredging can be very expensive, this method is most suitable for moderate to early infestations of milfoil and for follow-up milfoil removal after an herbicide treatment. Diver hand pulling is more effective in lightly scattered patches of milfoil, whereas diver dredging may be more appropriate in denser milfoil beds. Diver dredging may also be applicable in waterbodies where no herbicide use can be tolerated. Theoretically diver dredging could be used in any waterbody to eradicate milfoil; however the costs for large scale projects would become astronomical.

Special Considerations:

Development of an integrated vegetation management plan is advised prior to beginning a diver dredging project. Diver dredging projects may require a federal permit from the US Army Corps of Engineers. The necessity for this permit is site dependent.

Description of a diver dredging project in Washington:

The littoral zone of the lake is surveyed immediately prior to starting control work and milfoil locations are mapped and Global Positioning System (GPS) points established. Diver dredging can begin as soon as milfoil can be easily seen and identified - generally in the spring. If diver dredging is being used as a milfoil eradication method also see the milfoil eradication strategy using hand pulling and bottom barrier installation. Diver dredging can be used in conjunction with these other methods to achieve eradication; with dredging used to reduce the density of plants, followed up by hand pulling. Generally diver dredging projects continue for several years and are very expensive.

During diver dredging, the divers may use a tool to loosen milfoil root crowns before using a suction head to remove the plant. In hard-packed or rocky sediments, the plants often break off at the root crown, leaving the root behind to regrow. In these areas, alternative control methods, such as bottom barrier installation, should be used. In locations with denser milfoil colonies, divers should make several passes through the area to ensure that all plants have been located and removed. Removed plants can be used for compost rather than having to be discarded as solid waste.

Factors that affect the success of diver dredging include: sediment type, visibility, amount of fragments created, density of native aquatic plants, and effort expended. The amount of acres

covered per day is dependent on plant density, ease of removal, and number of divers. Once milfoil plants have become sparse, diver hand pulling is just as fast as dredging and has less impacts.

Sometimes diver dredging equipment is used just to transport plants to the surface. The diver pulls the plant and uses the dredge hose to suction the plant to the support boat rather than placing the plants in a bag and carrying them to the surface. Using a dredge for plant disposal is not considered dredging and does not trigger the need for Corps of Engineers approval.

In Washington, diver dredging was used in Silver Lake in Everett to contain a relatively early infestation of milfoil. Although milfoil was not eradicated in Silver Lake, dredging, in combination with hand pulling and bottom barrier installation, did remove most of the milfoil from the lake. Diver dredging is also being used in Idaho lakes and rivers to contain recently discovered milfoil populations.

General impacts of diver dredging:

No research has been conducted in Washington to quantify the impacts of diver dredging. Although the object of diver dredging is to remove milfoil, sediment is unavoidably stirred into the water. The obvious impact of diver dredging is increased turbidity in the area of plant removal with the degree of turbidity dependent on the sediment type. Fine silty sediments produce more turbidity than sandy or rocky sediments. If turbidity interferes with the ability of the divers to see the milfoil plants, efficacy of plant removal can be affected. Diver dredging may also release buried pollutants and/or nutrients. In Silver Lake, sediment bioassays were required prior to dredging to ensure that the sediments did not contain toxic materials. Bioassays are probably more important in waterbodies with a history of mining, combined sewage outfalls, land filling, storm water outfalls, or other activities that may have contributed pollutants to the sediments.

It is very difficult to control fragment release during dredging operations. If a silt barrier is deployed around the dredging site for turbidity control, divers should make an attempt to collect milfoil fragments within the area before removing the barrier.

Follow-up to treatment:

Diver dredging, used alone, is probably not an eradication tool, but it can be the first step to reducing the biomass of milfoil to the point where other manual methods can be used to eventually eradicate the plant.

Appropriateness for Lake Stevens:

Diver dredging is not an appropriate method to be used on Lake Stevens at this time. Diver dredging is a technique that is most appropriate for early stages of infestation when there are only a few plants or patches that need to be removed, or in very small bodies of water. Diver dredging is expensive, and only about .25 acres can be treated per day. Diver dredging may become appropriate at some point if other control techniques (i.e. repeated herbicide treatments) nearly eradicate milfoil from the lake.

Water Level Drawdown

Milfoil can sometimes effectively be controlled when waterbodies are dewatered by releasing water via a water level control structure (dam or weir) or by pumping. The effectiveness of milfoil control is determined by several factors including the amount of the waterbody bottom exposed, duration of exposure, presence of springs, and the weather at the time of drawdown. The success or failure of drawdowns in controlling milfoil can be highly variable from lake to lake and from year to year within the same waterbody (Vermont Agency of Natural Resources, 1989). G. Dennis Cook (1980) recommended lake level drawdown for macrophyte control in situations where prolonged (one month or more) dewatering of lake sediments is possible under rigorous conditions of cold or heat; a key factor being desiccation. The author pointed out that those conditions suitable for macrophyte control may not occur with heavy snowfall or during milder, rainy winters. More information about water level drawdown is available at the following web address:

<http://www.ecy.wa.gov/programs/wq/plants/management/drawdown.html>

Waterbodies suitable for water level drawdown:

In Washington, milfoil control has usually been a side benefit of drawdown regimes occurring in waterbodies and reservoirs for other purposes such as for power generation, irrigation, or flood control. The impacts of fluctuating water levels are severe on a natural waterbody so this activity rarely occurs solely for milfoil control in Washington. Waterbodies suitable for water level drawdown are those with infestations of milfoil where drawdown occurs on a prolonged and regular basis. Because western Washington is so much wetter and milder than eastern Washington, drawdown is generally more successful in controlling eastern Washington milfoil populations. However, in some western Washington reservoirs, such as Tapps Lake and Riffe Lake, prolonged annual drawdowns have helped control milfoil infestations. Since milfoil survives in deeper water, drawdowns will not eradicate milfoil from the waterbody. Generally waterbodies with fluctuating water levels such as reservoirs are highly perturbed systems.

Special considerations:

Because water level drawdown impacts the entire waterbody, it should be conducted only under the direction of an integrated aquatic vegetation management plan. Few waterbodies in Washington, except for reservoirs, have water control structures and the means to lower the water level to the extent necessary to achieve significant milfoil control. Some lakes with water level controls also have court adjudicated water levels. Because impacts to habitat are severe, drawdown should only be considered as a milfoil control in waterbodies where the habitat value is not considered important by resource agencies.

Factors to consider when evaluating water level drawdown as a possible control for milfoil include:

- Presence of an outlet structure or the means to lower the water level;
- Amount of waterbody bottom exposed at different water levels;
- Timing of water withdrawal and return;
- Climate;
- Potential impacts to surrounding wetlands/emergent plants;
- Sediment type;

- Shoreline development;
- Species dependent on near-shore habitat;
- Endangered species and/or rare plants; and
- Sensitive areas (critical habitat).

General impacts of water level drawdown:

As the water recedes, docks and other shoreline structures, such as retaining walls and irrigation or potable water intakes, are exposed and shallow wells may run dry. It may become impossible to launch boats, and boating and other recreational activities may be curtailed or restricted during drawn down periods. On the plus side, lowered water levels may allow repairs to be more easily made to near-shore structures. Sometime drawdown can consolidate flocculent sediments and results in firmed sediments when the water returns.

Water level drawdown exposes the sediment and affects the habitat for emergent and submersed plants, fish, benthic invertebrates, waterfowl, and aquatic mammals. Vermont concluded that drawdown did major damage to deepwater wetland communities at Lake Bomoseen. It caused decreases to two rare plant species and provided only short-term control of milfoil. Greening and Gerritsen (1987) noted that frequent drawdowns result in a reduction in species diversity and favor tolerant plants, which eventually come to dominate the lake.

The impacts to animals by the Lake Bomoseen winter drawdown (September 1988 to March, 1989) were also significant. The drawdown "decreased habitat suitability for species that require stable water levels such as beaver and muskrat by preventing them from using their winter food supplies and exposing them to adverse weather and predation. Habitat suitability was decreased for species that overwinter in the bottom sediments such as frogs, turtles, and macroinvertebrates because freezing the sediment kills these animals." The Vermont report also concluded that the drawdown of Lake Bomoseen had an adverse impact on all the littoral zone macroinvertebrate communities (snails, mussels, aquatic insects). The impacts to fish by the Lake Bomoseen drawdown were difficult to measure because only one year of data was collected.

Other impacts that may occur after drawdown include:

- Low lake levels after winter drawdowns if insufficient spring rains fail to refill the waterbody;
- Dried up streams as water flows from the lake cease;
- Damage to the lake bottom; and
- Nutrient releases and algal blooms that occur after the water level rises.

There is some anecdotal evidence in Washington to suggest that milfoil seeds may germinate after summer lake bottom desiccation. In two small natural lakes in Thurston County where milfoil had been eradicated, milfoil appeared in abundance after drought conditions contributed to partial or whole lake drawdown. The fall/winter following the drought, the lakes, refilled and an abundant population of milfoil was observed in the spring/summer, particularly in the areas where the lakes had been dewatered.

Appropriateness for Lake Stevens:

Drawdown is not considered appropriate for Lake Stevens, due to the technical difficulties of

modifying the hydrology of the lake.

References:

Cook, G. D. 1984. *Lake level drawdown as a macrophyte control technique*. Water Resources Bulletin, Vol. 16, No. 2.

Greening, H.S. and Gerritsen, J. 1987. Changes in macrophyte community structure following drought in the Okefenokee Swamp, Georgia. USA. *Aquatic Botany*, 28:113-128.

A report prepared for the Vermont Legislature by the Vermont Agency of Natural Resources, Waterbury, Vermont. 1989. *The Lake Bomoseen drawdown: An Evaluation of its Effects on Aquatic plants, wildlife, fish, invertebrates, and recreational uses*.

Hand Pulling and Bottom Barrier Installation

Hand Pulling:

During hand pulling, milfoil plants are manually removed from the lake bottom, with care taken to remove the entire root crown and to not create fragments. In deeper water, divers are usually needed to reach the plants. See this web page for more information about hand pulling techniques: <http://www.ecy.wa.gov/programs/wq/plants/management/aqua022.html>.

Bottom Barrier Installation:

Bottom barriers are semi-permanent materials that are laid over the top of milfoil beds and are analogous to using landscape fabric to suppress the growth of weeds in yards. To learn more about bottom barriers and their environmental impacts, see the following web page:

<http://www.ecy.wa.gov/programs/wq/plants/management/aqua023.html>. To learn more about installing bottom barriers, see this site:

<http://www.ecy.wa.gov/programs/wq/plants/management/aqua021.html>

Waterbodies suitable for handpulling and installation of bottom barriers:

Due to expense and the time intensive nature of manual methods, sites suitable for hand pulling and bottom screening are limited to lakes or ponds only lightly infested with Eurasian watermilfoil. This method is suitable for very early infestations of milfoil and for follow-up removal after a whole lake fluridone treatment, a 2,4-D treatment, or diver dredging. To be cost-effective, generally the total amount of milfoil in the waterbody should be three-acres or less in area, if all the milfoil plants were grouped together in one location. If the infestation has advanced beyond this point, it is more effective to consider other eradication techniques such as aquatic herbicides. This method may also be applicable in waterbodies where no herbicide use can be tolerated such as in a lake used as a municipal drinking water supply. Theoretically, these methods could be used in any waterbody to eradicate milfoil; however the costs for large scale projects would become astronomical.

Special Considerations:

Factors that affect the success of hand pulling include: water clarity, sediment type, suppression of milfoil fragments, density of native aquatic plants, and effort expended. It is especially important to have good visibility for the divers to locate milfoil plants. Sometimes diving is only effective in the spring or fall, or during periods between algal blooms. If water clarity is very poor, manual eradication methods may not be suitable for the waterbody.

Description of a milfoil eradication project in Washington using handpulling and bottom barriers:

Lakes where manual methods are being used for milfoil eradication typically have milfoil lightly scattered singly or in small patches within the littoral zone. To determine the extent of the infestation, the littoral zone of the lake is surveyed immediately prior to starting control work and milfoil locations are mapped and Global Positioning System (GPS) points established. The survey can be conducted prior to the removal effort or take place during the removal effort.

Handpulling can begin as soon as milfoil can be easily seen and identified - generally in the

spring or as soon as it is discovered in the lake. Despite milfoil's tendency to fragment more readily during the fall, removal should be undertaken as soon as possible after the discovery of milfoil in the lake, no matter how late in the season. Both surface and underwater surveys should be conducted several times during the growing season. During the surface survey, a surveyor moves slowly through the littoral zone in a boat, looking into the water (often using a viewing tube), and marking the locations of milfoil plants with buoys. The surface survey is immediately followed by an underwater diver survey. Because known milfoil locations have been marked during the surface surveys, the divers can concentrate their efforts at these locations. Since diver time is expensive, it can be cost-effective to conduct surface surveys before underwater surveys.

During handpulling, the divers dig around and beneath the plant roots with their hands or with a tool and gently lift the entire plant out of the sediment. The ease of removal is dependent on sediment type. Milfoil plants can be readily removed from loose or flocculent sediments. In hard sediments or rocky substrate, hand tools must be used to loosen the root crown before the plant can be dislodged. Sometimes fine roots are left behind; these will not regrow, but it is important to remove the root crown (the fleshy, fibrous roots at the base of the stem). Once plants are removed, the diver places them into bags for transportation to the surface. Sometimes divers may use a suction device to deliver the plant to the surface. The plant is sucked up into the boat (generally using a gold dredge), the plants are retained in a sieve, and the water is discharged back into the lake. In locations with denser milfoil colonies, divers should make several passes through the area to ensure that all plants have been located and removed. As the divers work, the people in the support boat mark the locations of milfoil plants. An accurate location is important since the areas need to be resurveyed a few weeks later. There have been instances when small fragments or plants have been overlooked and have become large plants upon resurvey. Removed plants can be used for compost rather than having to be discarded as solid waste.

If colonies are too large for efficient handpulling or if repeated visits to the same site indicate that too many fragments or plants are being missed, bottom barriers should be installed. Burlap bottom barrier (or other biodegradable material) should be placed over the plants and anchored to the lake bottom using natural materials such as rocks or sandbags. The burlap should cover and extend well beyond the growth zone of the plants. Burlap or other natural materials are preferred because they will naturally decompose over a 2-3 year period.

Some lake groups hire contract divers and surveyors to conduct manual plant removal activities. Other lakes have relied on volunteer efforts. If volunteers are used, they must be trained in plant identification and proper removal methods.

General Impacts of handpulling:

Special care must be taken to prevent the release of milfoil fragments. At certain times of the year (generally after flowering), milfoil plants can fracture into hundreds of fragments, each having the potential to form a new plant. To help contain the fragments, individual plants may be covered with a mesh bag before they are pulled. The driver of the diver support boat must also be careful not to create additional fragments by keeping the boat and propeller out of the milfoil plants. People in the support boat should use net skimmers to retrieve any fragments accidentally released by the divers. Handpulling may increase turbidity in the area of removal. This can affect the efficacy of removal if the turbidity interferes with the ability of the divers to see the milfoil plants.

Follow-up to treatment:

Follow-up is essential to ensure the success of eradication. Even a few milfoil fragments left in the lake can start a new infestation or boaters may reintroduce milfoil into the lake.

Diver and surface inspections should continue at least twice a year during the growing season. Survey work should be as frequent as can be afforded since small milfoil plants or fragments may be easily overlooked.

Long term follow-up is the key!

Once milfoil is discovered in a lake, it generally requires continual maintenance to keep it at low levels. Even if milfoil appears to have been eradicated, it often is reintroduced by boaters. As long as the lake group continues surveying, new introductions can be identified quickly and targeted for removal before milfoil can reestablish in the lake. Although labor intensive, these manual techniques have been used to successfully eradicate milfoil in a drinking water reservoir in Washington.

Appropriateness for Lake Stevens:

Handpulling Eurasian watermilfoil is not appropriate for Lake Stevens in the short-term due to the high density of milfoil and the large size of the lake. However, this may be an option as a means of establishing long-term control of Eurasian watermilfoil in the lake if overall milfoil abundance is reduced to lower levels. Bottom barriers are not considered appropriate of use at the lakes at this time due to the extent of the Eurasian watermilfoil infestation. As with handpulling, bottom barrier may be appropriate once the over milfoil abundance is reduced.

Homeowner Control Options

In addition to handpulling and installation of bottom barriers there are varied other techniques that can be applied to a smaller control area. These are often applied by homeowners. They include:

- Cutting (using special cutting tools);
- Raking;
- Weed Rollers (a device that consists of motor-driven metal cylinders that roll in an arc along the lake bottom);
- Diver dredging (a diver-operated suction dredge that vacuums milfoil from the lake bottom); and
- Spot treatment with herbicides (chemicals appropriate for killing or suppressing milfoil growth in small areas).

Waterbodies suitable for homeowner local control options:

Waterbodies suitable for individual home owner control options include lakes or ponds heavily infested with milfoil, where there has not been a comprehensive or lake-wide milfoil management plan developed and implemented. Or, where a plan has been developed and it calls for homeowner control. In these situations it is up to each homeowner, at their expense, discretion, and with proper permitting, to remove milfoil from their lake front property. Some of these methods may not be suitable in waterbodies experiencing an early infestation of milfoil because fragments may be created and cause increased spread.

Many of these methods offer only temporary relief because milfoil fragments will drift in from adjacent unmanaged areas and invade the cleared area. Some actions, for example cutting, raking, and handpulling, need to be repeated at intervals during the summer to maintain milfoil-free areas. Methods, such as installing bottom barriers (if kept maintained) or installing a weed roller (if operated on a regular basis), may offer longer term control. Spot treatment with aquatic herbicides may result in adjacent waters being inadvertently treated through drift. It is important to talk with neighbors to ensure that they are comfortable with the idea of chemical treatment before proceeding with any herbicide applications.

Description of methods:

All of these methods and their impacts have been described in detail on the Department of Ecology website. The web address for each method is listed below:

Manual Methods: <http://www.ecy.wa.gov/programs/wq/plants/management/aqua022.html>

- Hand pulling
- Cutting
- Raking

Weed Roller®: <http://www.ecy.wa.gov/programs/wq/plants/management/aqua029.html>

Diver Dredging: <http://www.ecy.wa.gov/programs/wq/plants/management/dredging.html>

Spot treatment with herbicides:

<http://www.ecy.wa.gov/programs/wq/plants/management/aqua028.html>

Appropriateness for Lake Stevens

Homeowner control of milfoil is highly discouraged at this time. Though it can be an effective technique when there is no other large scale control strategy in place, the risks of fragmentation and further spread of the plants far outweighs any benefit. Homeowners are encouraged to keep a watchful eye for milfoil around their beaches and docks throughout the duration of this management plan.

BIOLOGICAL CONTROL STRATEGIES

Triploid Grass Carp

Triploid grass carp are plant-eating fish from the Amur River Basin and lowland rivers in China and Russia. They are used as biological control for overabundant aquatic plants in some Washington waterbodies. Only sterile fish (triploids) are allowed to be stocked into Washington waters. You can obtain more information about grass carp at this web site:
<http://www.ecy.wa.gov/programs/wq/plants/management/aqua024.html>.

Waterbodies suitable for grass carp stocking:

Grass carp are generally not recommended for milfoil control because milfoil is not a highly preferred food. Some research has indicated that grass carp have food preferences and will consume more palatable plant species, such as pondweeds and waterweed, before they will eat milfoil. As a result, the concern is that they can enhance milfoil growth by removing competition from native plants and opening up more area for milfoil to colonize. Grass carp can be used for milfoil eradication/control only in waterbodies where the eradication of ALL submersed aquatic plants can be tolerated. Sites where grass carp may be suitable for milfoil control are rare. They include very urban lakes like Green Lake in Seattle, privately-owned artificial lakes, or small lakes with a virtual monoculture of milfoil.

Special considerations:

WDFW requires that all inlets and outlets to the lake be screened to keep grass carp from leaving the system. Therefore, grass carp are generally not allowed in waterbodies with salmon or steelhead since these fish need to pass freely between the lake and salt water. WDFW requires a lake-wide plan before allowing grass carp to be stocked into public lakes.

Description of a grass carp stocking project:

The Department of Fish and Wildlife determines the applicability of stocking grass carp into a waterbody and provides a grass carp stocking rate. To achieve milfoil eradication, a high stocking rate of fish per vegetated acre must be used. Since milfoil is not a preferred food, grass carp will eat the more palatable plants first. If too low a stocking rate is used, grass carp may actually enhance milfoil growth by removing competition from native plants and opening up more area for milfoil to colonize. In the few Washington lakes where grass carp have eradicated milfoil, all the other submersed plants in the lake have also been eliminated (e.g. Silver Lake, Cowlitz County; Surfside Lakes, Pacific County). In Washington, grass carp do not appear to eat floating leaved plants like water lilies or emergent vegetation such as cattails and bulrush.

Once grass carp stocking has been approved, Fish and Wildlife will issue a permit and provide a list of fish farmers to the project sponsor. Most grass carp farms are located in the southern US because fish grow faster in warm southern waters. Also fertile fish are not allowed in Washington so they can't be raised here. The fish farmers generally sell ten to twelve inch fish. This size of fish is considered to be large enough to avoid bass predation. It is sometimes possible to purchase larger fish, but the costs per fish increase. Depending on the number of fish, grass carp are either transported to the site in special trucks or air freighted. One concern is that the fish farmers certify that the water that the grass carp are transported in is free from exotic

organisms such as zebra mussels or the spiny water flea. The fish must also be certified as being triploid (sterile) and disease-free. The grass carp are released into the lake immediately upon their arrival. Most fish survive the trip from the fish farm, but some mortality from shipment stress is expected.

Many people prefer to stock their lakes in the spring to avoid winter stress. Once the fish are stocked, they are at risk from predation from birds of prey and otters. With abundant food and warm waters, the fish generally grow rapidly during their first summer and soon become too large for most birds to capture. Once the fish are stocked, observers may occasionally see them basking near the surface or moving in schools through the water. Their back fins often emerge from the water causing them to look like little sharks. If the correct numbers of fish have been stocked and mortality has been low, the amount of plants should slowly decline in the lake over two-three years with the palatable species disappearing before the milfoil plants. Once all submersed plants are eaten, grass carp have been known to consume detritus and organic material from the sediments (Gibbons, 1997).

As the stocked fish age, their feeding rate declines. Each year some mortality occurs and these sterile fish will eventually die out. As their population declines, native plants that have seeds or long-lived reproductive structures in the sediment may return. It is hoped that when this happens, milfoil will not reoccur in the waterbody.

General impacts of grass carp stocking:

There can be significant impacts to the waterbody following grass carp stocking. Since native plants provide habitat, sediment stabilization, and many other important functions, removal of all submersed plants can have a severe impact on the waterbody. Most of the impacts due to grass carp stocking are attributed to the removal of the plants rather than direct impacts of the fish.

The Department of Fish and Wildlife investigated the effects of grass carp on the water quality of 98 Washington lakes and ponds (Bonar, et. al, 1996). The average turbidity of sites where all submersed aquatic plants were eradicated was higher (11 nephelometric turbidity units [NTU's]) than sites where aquatic plants were controlled to intermediate levels (4 NTU's) or at sites where the vegetation was not affected by grass carp grazing (5 NTU's. In Silver Lake, NTU's of 50 were observed after all submersed plants were removed (Gibbons, 1997). Although there have been some reports that grass carp stocking can increase algal blooms, this does not appear to be the case in Washington. The increase in turbidity was all abiotic (probably suspended sediments). In other words, once the submersed species are removed or partially removed the lake becomes more turbid or muddy. Never the less, the satisfaction rate of the pond owners or lake residents with the results from stocking grass carp was high.

Frodge et. al (1995) observed positive water quality changes in Bull Lake, Washington and Keevies Lake, Washington after they were stocked with grass carp. Grass carp stocking and the resultant plant removal reduced some of the deleterious problems caused by excessive plant growth, such as low dissolved oxygen and high pH. The lake bottom in Silver Lake went from being anoxic and devoid of bottom dwelling invertebrates to oxidized and supportive of benthic organisms after grass carp had removed all submersed vegetation (Gibbons, 1997). Pauley et. al (1995) studied fish communities for a six year period in three lakes before and after grass carp stocking. They concluded that while changes in fish populations did occur in the lakes, no

consistent trend occurred after the introduction of grass carp. It should be noted that in two of the lakes, aquatic plants were not totally eliminated.

Waterfowl that feed on submersed plants are affected when these plants disappear. A report from Silver Lake (Gibbons, 1997) showed that although there were no clear indications that the number of waterfowl in the lake had declined after grass carp introduction in May 1992, there was a sharp decrease in American coots in 1994, 1995, and 1996. These data suggest that the loss of submersed plants from the lake resulted in fewer birds that depended on these plants for food from Silver Lake.

Follow-up:

Lake groups are strongly advised to monitor plant species and area of coverage, before and for several years after stocking grass carp. If the plants have not reduced in area or biomass after three years, more grass carp should be added. Since Fish and Wildlife issues the permit for extra fish, having monitoring data will provide them with the information to evaluate the request for extra fish.

Appropriateness for Lake Stevens:

Grass carp stocking is not an appropriate milfoil control method for Lake Stevens. Lake Stevens currently supports many beneficial aquatic plants besides milfoil. Grass carp are likely to remove these plants first, which would be damaging to Lake Stevens' ecosystem.

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Milfoil Weevil Introduction

The milfoil weevil is an aquatic insect that is native to North America and Washington state. It has been associated with declines of Eurasian watermilfoil in the United States (e.g. Illinois, Minnesota, Vermont, and Wisconsin). The Milfoil weevil reaches 2-3 mm in length and carries out its life-cycle feeding and reproducing on milfoil plants. It is naturally present in many Washington lakes and was experimentally introduced in Mattoon Lake in central Washington. You can obtain more information about milfoil weevils at the following websites:

<http://www.ecy.wa.gov/programs/wq/plants/management/weevil.html>

<http://fwcb.cfans.umn.edu/research/milfoil/milfoilbc/weevil.html>

<http://www.ecy.wa.gov/programs/wq/plants/management/biocontrol.html>

Water bodies suitable for milfoil weevil introduction or augmentation

Little is known about the suitability of water bodies for milfoil weevil introduction. There are a few examples where milfoil weevils have been successful at reducing milfoil populations such as in McCullom Lake in Illinois, where it is thought to have nearly completely eliminated milfoil that once covered 70% of the lake. In other cases where the weevil is present, little effect has been noticed. It is thought that fish predation may impact the weevil populations and limit their effectiveness as a control mechanism.

Special considerations:

The milfoil weevil is native to Washington and is present in a number of lakes and rivers. It is found associated with both native northern milfoil and Eurasian watermilfoil. A company sells milfoil weevils. However, to import these out-of-state weevils into Washington requires a permit from the Washington Department of Agriculture. As of December 2009 no permits have been issued for Washington.

Description of milfoil weevil project:

During the summers of 2002 -2003 we conducted a weevil rearing and augmentation study to meet three objectives:

- To gain experience collecting, rearing, and releasing the milfoil weevil,
- To monitor the introduced milfoil weevils and aquatic plant community at a study site,
- To determine whether fish target the milfoil weevils as a new or more prevalent prey item.

Augmentation site:

Mattoon Lake, located near the town of Ellensburg in Central Washington, was selected as the milfoil weevil introduction site. It is a small, shallow, man-made lake, with a maximum depth of about 5 m (16 ft). Aquatic plants grow throughout the lake. At project inception Eurasian milfoil dominated the submersed plant community in water 2-12 feet deep.

Weevil collection:

Through the summers of 2002 and 2003 we collected adult weevils from Stan Coffin and Burke Lakes in Grant County each week for about 12 weeks by snorkeling. The adult weevils were collected from *M. sibiricum* (northern milfoil) plants throughout the summer of 2002. The peak collection time was the end of July through the end of August, when an experienced snorkeler could collect at a rate of about one weevil per minute. Often there were two or three weevils per milfoil stem; a density thought to be great enough to control *M. spicatum* growth (In fact, Eurasian milfoil is present in both lakes, but difficult to find.).

In fall 2002, weevil activity was monitored in Stan Coffin Lake until they abandoned the plants for their over-wintering habitat on shore. The weevils were still evident, though in reduced numbers, in mid-October with a water temperature of 55° F (13° C). By November 1, 2002, the weevils were very difficult to locate with only one weevil found in 20 minutes of snorkeling; the water temperature was 43° F (6° C).

Weevil rearing:

The captured weevils were kept in aquariums at the Fish and Wildlife Department buildings in Yakima for between 5 and 14 days. At the end of the rearing period we counted the numbers of eggs, larvae and adults. Then the weevils and their progeny were introduced into Mattoon Lake at designated release sites. From a small boat, we wound the milfoil pieces on which the weevils were clinging around existing surfacing milfoil at the release sites in the lake. This cycle of rearing and release continued throughout the summers.

Monitoring:

To monitor the milfoil weevil population at Mattoon Lake, two methods were used: a qualitative check for adult weevils and characteristic damage on milfoil plants, and quantitative sampling at points throughout the lake. For the qualitative check, experienced weevil-hunting snorkelers conducted three 20-minute visual searches in selected areas of the lake, including those sites chosen for weevil introduction. The quantitative data were obtained by collecting milfoil stems from designated locations in the lake. In the lab each plant was inspected for presence of all weevil life stages and weevil damage using a dissecting microscope. These data were collected prior to weevil release and at the end of summer in 2002, and again in 2003, 2005, 2007, and 2008.

Aquatic plants at Mattoon Lake were monitored using both plant biomass and frequency data. Biomass was collected by a SCUBA diver. Samples were separated by species and dried and weighed. Frequency data were collected at points on a 30 m grid covering the whole lake. Data were collected before initial weevil introductions occurred and every year since except 2006 for frequency data and in 2003, 2004, and 2008 for biomass.

The fish community was sampled by the Washington Department of Fish and Wildlife. Sampling occurred at the end of May 2002 before any weevil stocking had begun. The species composition of the community was assessed by electroshocking. At that time stomach samples

from each species that reached a size big enough to consume adult weevils as part of their diet (i.e., the sunfish, bass, perch, and trout) were also collected. The stomach contents from a subset of the fish caught by eletroshocking were flushed into a sample container and preserved in ethanol. Samples were analyzed in the lab by a contracted macroinvertebrate specialist. The fish community was again assessed in fall 2007 without the diet analysis, and again in 2008 with the diet analysis. Those data are undergoing evaluation.

Results:

There was no sign of weevil establishment in Mattoon Lake at the end of 2002. The Department of Fish and Wildlife fish population inventory in spring 2002 revealed that Mattoon Lake had a very dense population of small pumpkinseed sunfish (Divens 2003). Other studies had found that pumpkinseed and bluegill sunfish will eat milfoil weevil adults (Sutter and Newman 1977; Lord et al 2003). Thus, it is suspected that the pumpkinseed in Mattoon Lake suppressed widespread establishment of the weevils we introduced.

General impacts of milfoil weevil introduction.

Little is known about the general impacts of milfoil weevil introduction, as it is a very new control strategy. The milfoil weevil is a target specific bio-control agent meaning that it only attacks species of milfoil, and not other plants. Presumably, introduction of the weevil would not have a noticeable effect other plant species. There is a native milfoil in Washington, so introducing milfoil weevils could potentially harm these native populations. However, microcosm studies conducted at the university of Minnesota show that milfoil weevils have an affinity for Eurasian water milfoil over the native North American milfoil probably due to the more delicate tissue and slender stem of the Eurasian variety. In lakes where the weevil has successfully controlled milfoil infestations, milfoil populations rebounded after a few years, and then diminished again, probably reflecting a cyclic predator prey relationship. (Illinois EPA, 2002).

Appropriateness for Lake Stevens:

Milfoil weevil introduction is not appropriate for Lake Stevens. The effectiveness of the weevil is not understood enough at this point to be considered a dependable control strategy. Obtaining permitting from the Department of agriculture to import the milfoil weevil to Lake Stevens may not be possible at this time.

References:

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CHEMICAL CONTROL STRATEGIES

Whole Lake Fluridone Treatment

Fluridone is a systemic herbicide that kills the entire plant and is generally non-selective since most submersed plants will be killed or affected by a whole lake treatment. Fluridone inhibits the formation of carotene (pigment) in growing plants. In the absence of carotene, chlorophyll is degraded by sunlight. Because this is a slow process and the plants can "grow out" of this if fluridone is removed, the contact time between the plant and chemical needs to be maintained for many weeks. Sonar® and Avast!® are the trade names for aquatic herbicides that contain fluridone as the active ingredient. The liquid formulation of fluridone has been used for whole-lake milfoil eradication projects. A granular formulation is also available, but has not been used for whole lake treatments. The premise for using fluridone as an eradication tool is that milfoil rarely produces viable seeds, so killing the vegetative growth will prevent spreading through fragmentation. Milfoil is particularly susceptible to fluridone and it is theoretically possible to achieve 100 percent kill. If all the milfoil plants are killed by fluridone treatment the only way that milfoil can reinfest the lake is to be reintroduced or germinate from seeds. Germination by seeds is considered rare.

Waterbodies suitable for whole-lake fluridone treatment:

Lakes and ponds suitable for whole-lake fluridone treatment are heavily infested with Eurasian watermilfoil throughout the littoral zone. Fluridone is not suitable for spot treatments (sites less than five-acres within a larger waterbody) since it is difficult to maintain enough contact time between the plant and the herbicide to kill the plant. If milfoil is limited to patches within the littoral zone, 2,4-D may be a more effective treatment method (see the 2,4-D milfoil eradication strategy). Due to the high treatment costs, fluridone treatments have been limited to smaller sites in Washington. The largest lake in Washington where this method has been used for milfoil eradication has been Long Lake (about 330 acres). In larger lakes, treatment of selected coves or embayments is possible, although milfoil will eventually reinvade from untreated areas. In Shoecraft Lake In Snohomish County, fluridone was applied to areas of the lake sequestered behind long(up to 0.5 miles) fabric curtains. This technique allowed applicators to maintain effective concentrations of fluridone behind, and leave the majority of the lake area untreated.

Special considerations:

While there are no swimming, fishing, or drinking water restrictions when fluridone is in the water, the label warns against using the water for irrigation for seven to thirty days after treatment. Even at the low fluridone concentrations used to treat milfoil, some terrestrial plants may be sensitive to fluridone if they are watered with treated lake water.

Washington has had excellent success using this fluridone for milfoil eradication/control, but there is no guarantee that every lake group who tries this method will achieve the same results. Each site is different and many environmental factors may affect the treatment. Developing a site-specific plan for each lake is crucial to identifying environmental factors or concerns that may impact the treatment outcome.

Description of a milfoil eradication project using fluridone:

When the project goal is eradication, a whole lake fluridone concentration of 12-15 ppb (parts per billion or mg/liter) should be maintained in the lake for approximately ten weeks during the spring and/or summer. While it is possible to achieve successful milfoil control at lower concentrations (as low as 3-6 ppb), these higher levels are recommended to ensure that all milfoil plants are killed.

Before application, the lake volume must be determined to ensure fluridone is applied in a sufficient amount to result in the target whole lake concentration. If the lake is shallow and not thermally stratified, concentrations throughout the water column must remain in the 12-15 ppb range. If the lake is deep and thermally stratified (warm above and cold below), these concentrations can be maintained in the epilimnion (warmer surface layer of water) rather than throughout the water column.

Treatment costs will vary based on lake surface area, water volume treated, and the number of treatments needed to maintain the target concentration for ten weeks. The SePRO Company (distributor for Sonar®) has developed a new patented test called planTEST™ that their preferred applicators may use. Treated plants are collected a few weeks prior to treatment and planTEST™ determines the concentration of Sonar® needed to kill the target weed. If milfoil in the lake is particularly susceptible to fluridone, it may be possible to reduce the concentration of fluridone needed to effectively treat the infestation.

Treatments can start as soon as milfoil begins rapidly growing. This can be as early as April or May and as late as early July and is site-specific. Much depends on the timing windows for salmon usage (provided by Washington Department of Fish and Wildlife for each waterbody) since juvenile salmonids should not be exposed to chemicals. Another critical factor particularly in western Washington is water flow. A heavy rainfall may wash the herbicide out of the system. For deeper lakes, treatment should be delayed until the thermocline develops and stabilizes in summer. For these reasons, fluridone treatments in Washington often begin in June or July rather than earlier.

Fluridone is applied in a liquid formulation by sub-surface injection from trailing hoses by a state-licensed applicator. About a day or two after treatment, water samples should be collected to determine fluridone concentrations. The number of samples required depends upon the size and shape of the lake. In a long narrow lake, three samples may be enough to determine lake concentration. In a small round lake, one sample taken in the middle may be sufficient. In a lake with many coves or channels, a number of samples may be needed to determine a whole lake concentration. Testing the water ensures that the target concentration of fluridone has been met. The SePRO Company and Griffin LLC (distributor for Avast!) both have fluridone analysis test kits. Test results can be available within 48 hours and each sample costs about \$100. Other laboratories can also perform fluridone analysis, but turnaround times for results may be longer. Fluridone concentrations are maintained in the lake over time by the application of additional herbicide at about bi-weekly intervals or as needed. To determine how much herbicide to add, water samples are collected about 10 to 14 days after the initial treatment and analyzed for fluridone. Generally during this two-week period, fluridone concentrations decrease by about half, due to plant uptake and exposure to sunlight. Fluridone is also more persistent in cooler waters. After fluridone concentrations are determined, the applicator applies enough herbicide to the lake to bring the whole lake concentration back up to the 12-15 ppb range. This scenario

continues until fluridone concentrations have been held at 12-15 ppb in the lake for ten weeks. This fluridone concentration and exposure time should be sufficient to kill milfoil plants. During a typical treatment, the applicator may apply fluridone to the lake four times.

The SePRO Company has also developed a new patented test called effecTEST™ that their preferred applicators may use. Treated plants are collected at about five to six weeks after the initial treatment and effecTEST™ determines whether these plants have received enough herbicide to kill them or if a higher (or lower) concentration is needed.

General impacts of fluridone treatment:

There are significant impacts to the waterbody during and following treatment. Fluridone is a generally non-selective herbicide, which means most submersed plants and some floating leaved plants will be killed by fluridone during the treatment. Emergent species like cattails will be impacted but will recover. A week to three weeks after the initial treatment, observers will see the growing tips of aquatic plants bleach pink to white. Water lilies will appear bleached and cattails and other emergent species may look variegated. Since this is a slow process, low oxygen conditions do not develop. The plants eventually drop out of the water column by about six weeks post-treatment.

While there is no direct toxicity of fluridone to animals, the loss of habitat does cause indirect impacts. The smaller fish lose their hiding places and because the larger fish can find them easily, they have greater chances of being eaten. Waterfowl that eat vegetation tend to move onto other vegetated waterbodies while waterfowl that eat fish enjoy better fishing opportunities on the treated lake. Sometimes increased algal blooms are observed in the year of treatment and for a year following treatment. However, eventually the lake reaches a new equilibrium and native aquatic plants recover. Naturally occurring plants have viable seeds, tubers, and overwintering buds that allow them to revegetate the lake the year following treatment, while milfoil does not. In Washington the colonization of the lake bottom by plant-like algae called brittlewort (*Nitella* spp.) and stonewort (*Chara* spp.) is often observed following a fluridone treatment. This is because algal species are resistant to fluridone and removing milfoil opens up space for them to colonize.

Up to 100 percent of the Eurasian watermilfoil in the lake should be killed. However in inlets or areas where the herbicide may be diluted by flowing water (including in-lake springs), milfoil may be undertreated and must be physically removed if eradication is to be successful. These areas should have been identified during plan development and alternative methods planned for milfoil removal. Undertreatment or no treatment of milfoil in inlet areas may result in the lake being reinfested unless immediate management methods are undertaken.

Follow-up:

For lakes that are heavily infested with milfoil, the goal of eradication should only be sought when lake residents are willing to finance and conduct the follow-up monitoring and treatments that are essential to ensure long term success. The littoral zone of the lake should be thoroughly inspected by divers in the fall of the treatment year and the next spring as well to identify any milfoil plants that may have been undertreated. Areas where this might happen include areas of lake bottom with springs or near inlet streams. Any remaining milfoil plants should be hand pulled or covered with bottom barriers (See: Eradication - Hand Pulling and Bottom Barrier

Installation). Diver and surface inspections should continue at least twice a year during the growing season on an ongoing basis. Survey work should be as frequent as can be afforded, since small milfoil plants may be easily overlooked. Often divers report finding two to three foot tall milfoil plants in areas that they had extensively searched only three weeks earlier. As native plants recover, it will become more difficult to locate any milfoil plants.

Very important note!

In most Washington lakes treated with fluridone, milfoil is found growing in the lake from two to five years later. It is suspected that milfoil is reintroduced via boating activity, since it is often discovered near a public boat launch. As long as the lake group has continued the survey work, these new introductions can be identified quickly and targeted for removal before milfoil reestablishes. In treated lakes where lake groups have continued the diver and surface inspections, milfoil remains at extremely low levels and recreation, fishing, and habitat remain healthy. In the few lakes where inspections did not continue, milfoil reinvaded and the lakes returned to pre-treatment infestation levels. It is interesting to note that the one lake where milfoil never returned after treatment is a canoe and kayak lake only and located on an island (Goss Lake).

Follow-up is the key!

While it is very difficult to totally eradicate milfoil from a lake forever, extensive and long-term follow-up activities make it possible to maintain extremely low levels of milfoil that will not impede recreational activities or impact native plant communities. As an example, Long Lake in Thurston County was treated with fluridone in 1991. In 1995, milfoil was discovered growing near the public boat launch. Since then the lake residents and Thurston County have been successfully maintaining extremely low levels of milfoil in the lake by surface and diver survey and hand pulling. In 2001 about 90 pounds total wet weight of milfoil was removed from the 330-acre lake (Ryan Langen, personal communication). Much less milfoil was found in 2002. These activities are not inexpensive, but are considered a necessary cost to maintain this lake in good condition for recreation and habitat. Should these management measures cease, milfoil would probably reinfest the lake within three to five years.

Appropriateness for Lake Stevens:

A whole lake treatment of fluridone is not appropriate due to the size and depth of Lake Stevens. Maintaining high enough concentrations of the chemical would simply be impossible. Since the densest growth of milfoil is limited to a few areas of the lake it may be possible to use limnic curtains (fabric curtains) to sequester the areas of densest growth and treat those areas with fluridone. This treatment technique proved to be highly effective in Shoecraft lake in Snohomish County, Washington. Not all of the milfoil that is present in Lake Stevens could be isolated behind curtains. It is possible that these areas of sparser more sporadic growth could be treated with another herbicide such as triclopyr. It also may be possible to use slow release fluridone pellets which may maintain effective concentrations in the treatment zone.

2,4-D Treatment

2,4-D is a relatively fast-acting herbicide that kills the entire plant (systemic herbicide). Its mode of action is primarily as a stimulant of plant stem elongation. This herbicide is considered to be "selective" for milfoil because it generally targets the broad-leaved plants (dicots) like milfoil. Most other aquatic plants are monocots (grass-like) and are unaffected by 2,4-D. Navigate® and Aqua-Kleen® are granular 2,4-D products registered for aquatic use and DMA*4IVM® is a liquid formulation. The risk assessment and the impact statement can be viewed at the following web address: http://www.ecy.wa.gov/programs/wq/pesticides/seis/risk_assess.html.

Waterbodies suitable for 2,4-D treatment:

Sites suitable for treatment include lakes or ponds partially infested with Eurasian watermilfoil such as waterbodies where milfoil has recently invaded, but where the extent of the infestation is beyond what can be removed by hand pulling or bottom screening. In these situations an herbicide, like 2,4-D, that is effective for spot treatment can be used to reduce the amount of milfoil so that hand pulling can remove any milfoil plants that are not killed. 2,4-D is suitable for spot treatment because it is a fast-acting herbicide that only needs a 48-hour contact time with the plant. 2,4-D can be used for milfoil control in heavily infested lakes, but it does not provide the nearly 100 percent kill of the herbicide fluridone. Because many plants remain alive and scattered throughout the littoral zone after 2,4-D treatment, hand pulling extensive areas after treatment may not be effective in heavily infested lakes. Lake residents must be willing to fund the follow-up activities necessary to ensure continued milfoil eradication (or maintenance at extremely low amounts).

Special considerations:

Water users need to be identified prior to 2,4-D application. Water within the treatment areas cannot be used for drinking until 2,4-D concentrations have declined to 70 ppb and water used for irrigation cannot be used until 2,4-D concentrations are 100 ppb or less. If water users do not have other water sources, the project proponents must arrange for alternative water supply during the time that 2,4-D is in the water. In Washington, testing has shown that water both inside and outside of the treated area is generally below the drinking water standard three to five days after treatment.

Description of a milfoil eradication project in Washington using 2,4-D:

Lakes where 2,4-D is being used for milfoil eradication in Washington typically have milfoil scattered in patches within the littoral zone. The lake is surveyed immediately prior to herbicide application and milfoil locations are mapped and Global Positioning System (GPS) points established.

Herbicide application can begin as soon as milfoil starts rapidly growing. Effective treatments can be made as early as April or May and as late as early September. Timing is also dependent on salmon usage since juvenile salmonids should not be exposed to chemicals. Treatment in the spring/summer should be followed by a late summer survey and possible retreatment if large patches remain or if more milfoil is discovered in untreated areas of the lake.

A month after the initial 2,4-D treatment, the littoral zone of the lake should be thoroughly inspected by divers to identify and map remaining milfoil plants. Sparse populations of remaining milfoil plants should be hand pulled or covered with bottom barrier. Larger, denser patches may need to be treated again with 2,4-D, although in that case some assessment should be made as to why the initial treatment was ineffective. Diver and surface inspections should continue at least twice a year during the growing season. Survey work should be as frequent as can be afforded since small milfoil plants may be easily overlooked within the native plant beds. Often divers report finding two to three foot tall milfoil plants in areas that they had extensively searched only three weeks earlier.

The herbicide is available in a granular and liquid form and application must be made by a state-licensed applicator. The granular formulation of 2,4-D is typically applied using a bow-mounted centrifugal or blower-type spreader and uniformly spread over the water above the milfoil beds and slightly beyond. The clay particles sink to the bottom or are caught up in the plants. The herbicide slowly releases from the clay over the next day. Granular formulations are generally recommended for spot treatment since liquid applications may have more tendency to drift away from the milfoil beds. When the liquid formulation is used, it is applied using subsurface trailing hoses. In both cases, if the project is funded by an Ecology grant or if there are irrigation or drinking water concerns, monitoring will be required. A 2,4-D analysis test kit should be available soon or environmental laboratories can also perform 2,4-D analysis. Rapid turnaround of results costs more.

General impacts of 2,4-D treatment:

2,4-D is a selective herbicide and milfoil is particularly susceptible at a labeled rate of about 100 pounds per acre (granular product). At this rate impacts to other aquatic plant species are minimal. Even if applied at higher rates there are only a few other aquatic plant species that are affected by 2,4-D. A study conducted in Loon Lake Washington showed that Eurasian watermilfoil was the only aquatic plant whose growth was statistically reduced by the 2,4-D application (Parsons, et. al, 2001). In the Loon Lake study up to 98 percent of the Eurasian watermilfoil biomass in the treatment plots was removed after the July treatment. Environmental and human health impacts of 2,4-D are addressed in Ecology's risk assessment of 2,4-D at the following web address: <http://www.ecy.wa.gov/biblio/0010043.html>.

A few days after the 2,4-D treatment, observers will see the growing tips of milfoil plants twist and look abnormal. These plants will sink to the sediments usually within one to two weeks of treatment. Unless treatment takes place in dense beds of milfoil, it is unlikely for low oxygen conditions to develop. Results of spot treatment may be variable depending on water movement, size of treatment plot, density of milfoil, weather conditions, underwater springs, etc.

Follow-up:

Follow-up is essential to ensure the success of eradication. Used alone, 2,4-D is not an eradication tool. Some plants survive the treatment and regrow, so these plants must be removed by other means. Surveys done in Minnesota indicated that, 2,4-D use did not result in eradication of milfoil over the long-term (Crowell, 1999). Treated lakes for which there was no follow up survey work or treatment eventually ended up with milfoil throughout the littoral zone.

Follow-up is the key!

Once milfoil is discovered in a lake, it generally requires continual maintenance to keep it at low levels. Even if milfoil appears to have been eradicated it often is reintroduced by boaters. As long as the lake group continues surveying on a yearly basis, new introductions can be identified quickly and targeted for removal before milfoil can re-establish in the lake. In treated lakes where the lake group has continued diver and surface inspections, milfoil remains at extremely low levels, without impacts to habitat or recreational activities.

Appropriateness for Lake Stevens:

This herbicide is appropriate for use in Lake Stevens for milfoil control. Because of its fast acting nature it may be effectively used for spot treatments, but can also be used in the areas of dense continuous growth as well.

References:

Crowell, W.J. 1999. *Minnesota DNR tests the use of 2,4-D in managing Eurasian watermilfoil*. Aquatic Nuisance Species Digest. 3(4):42-46.

Parsons, Jenifer K.; K.S. Hamel, J.D. Madsen and K.D. Getsinger. 2001. *The Use of 2,4-D for Selective Control of An Early Infestation of Eurasian Watermilfoil in Loon Lake, Washington*. J. Aquat. Plant Manage. 39:117-125.

Endothall Treatment

Endothall (active ingredient) is a fast-acting contact herbicide (an herbicide that burns back the above-sediment vegetation, but doesn't kill the roots) that is believed to disrupt the plant biochemical processes at the cellular level. The dipotassium salt of endothall is used for aquatic plant control and is formulated as Aquathol® K (liquid) and Aquathol® Super K Granular. The Washington State Department of Ecology recently completed a risk assessment and an environmental impact statement for endothall. The risk assessment and the impact statement can be viewed at the following web address:

http://www.ecy.wa.gov/programs/wq/pesticides/seis/risk_assess.html.

Endothall has been used for years in Washington lakes to spot treat milfoil along shorelines because it is rapidly-acting, and when used at higher concentrations (2-3 parts per million (ppm) needs only a short contact time to remove milfoil vegetation. Recently, lower concentrations (1-1.5 ppm) of endothall have been used to treat milfoil in whole lake or littoral zone treatments. Milfoil can be controlled (vegetative growth removed) at 1 mg/l active ingredient endothall with an exposure time of 48 to 72 hours. At this concentration, endothall impacts some native plant species to a lesser degree (Skogerboe and Getsinger, 2001).

The benefit of using low levels of endothall is to remove exotic weeds like milfoil, while allowing native species to recover. While this is not an eradication technique, it may be useful for maintaining more acceptable levels of milfoil in a lake by periodically treating the littoral zone with low concentrations of endothall. It is possible that treatments can occur as infrequently as every three years. Ecology, along with the Department of Fish and Wildlife, and the endothall manufacturer, Cerexagri, is conducting a study on a small western Washington lake (Kress Lake) to determine the efficacy of using low levels of endothall to control milfoil.

Waterbodies suitable for endothall treatment:

Whole littoral zone treatment with endothall cannot be considered as an eradication method. Endothall will suppress the growth of milfoil and may allow native plants to recover and therefore increase species diversity within a lake. Lakes and ponds considered suitable for littoral zone treatment are heavily infested with Eurasian watermilfoil. This method may be used where it is considered too expensive, or the waterbody is too large to use milfoil eradication strategies.

Special considerations:

The endothall label has a three-day fish consumption restriction in the area of treatment and an irrigation and stock watering restriction for 14-days after treatment. Ecology advises waiting 24 hours after any herbicide treatment before swimming, although there is no official label restriction for swimming. Care must be taken with the application so that low oxygen conditions do not develop as plants decompose.

Any whole lake or widespread herbicide treatment, such as littoral zone endothall treatment should be conducted under an integrated aquatic vegetation management plan.

Description of the Kress Lake project, using endothall:

A detailed report about the treatment and sampling methodology and the results of the Kress

Lake project can be seen in Ecology's Aquatic Plants Technical Assistance Program: 2001 Activity Report at the following web location: <http://www.ecy.wa.gov/biblio/0203025.html>. The information/data below were taken from that report. The project is still ongoing and additional data will be collected in August 2002 and June 2003.

Kress Lake, a 30-acre manmade lake in Cowlitz County, is a popular fishing lake with a nuisance population of milfoil. Kress Lake is owned and managed by Washington Department of Fish and Wildlife as a warm water fishery (bass, channel catfish, and sunfish) and has no inlet or outlet. Trout and surplus steelhead are also stocked into this landlocked lake. Prior to treatment, aquatic plants were found growing throughout the lake with milfoil as the dominant species. Both fishing and the fishery of the lake were being negatively impacted by the milfoil plants (Stacey Kelsey of Fish and Wildlife, personal communication). She reported that excessive vegetation was contributing to a stunted fish population, and milfoil mats, especially along the shoreline, were interfering with fishing. The endothall study was undertaken to see if a low concentration of endothall could selectively remove milfoil, increase species diversity, and improve fishing and the fishery.

On June 21, 2000, a state-licensed applicator applied Aquathol® K at rate of 1.5 ppm to ten acres around the edge of the lake. A second treatment took place a month later with an additional 10 acres treated from the shorelines toward the center of the lake using the same application rates.

Assessment of the treatment project is ongoing. Three months after treatment the endothall treatment reduced the frequency with which the vascular plants (flowering plants like milfoil) were found, while not affecting the macroalgae muskgrass (*Chara* sp.). During this period, vascular plants were reduced to the point of eliminating plant cover completely in locations throughout the lake. By one year after treatment and throughout that summer (June 2001 and September 2001) the frequency of muskgrass appeared to level-off while some of the vascular plants increased (e.g. waterweed, (*Elodea canadensis*), milfoil (*M. spicatum*), and bladderwort (*Utricularia* sp.). This recovery appeared to fill in areas left bare of plants the previous summer. The pondweeds (*Potamogeton* sp.) did not appear to be rebounding.

Two species showed a significant change in their biomass before and after treatment. The biomass of waterweed (native plant species) increased significantly one year after treatment. About one third less milfoil biomass was collected after treatment (76 g/m² - before treatment versus 23 g/m² - one year after treatment).

The species list from each sample date shows that the species diversity was greatest in June 2001; one year after treatment. A total of 12 different plant types were present at that time. This is almost double the number found before the herbicide treatment. The number of plant types observed decreased to 9 by the September 2001 sampling event. This may have been due to sampling variability, increased dominance by a few species making locating less common species more difficult, or the seasonal die off of selected species.

Endothall (Aquathol K) significantly reduced both the biomass and frequency of observation of milfoil, over the study period. However, by 1.3 years after treatment milfoil was showing a significant increase in frequency, so the duration of the control may be ending. The results also

show an increase in overall submersed aquatic plant species diversity one year after treatment.

Although the June 2002 data have not been statistically analyzed, surprisingly milfoil did not appear to have increased in frequency or biomass when compared to the previous year (Kathy Hamel, personal observation).

General impacts of endothall treatment:

Generally endothall is used to spot treat areas and therefore impacts are not widespread. Using low levels over the lake littoral zone does cause adverse impacts in the short term, since many vascular plants are affected by the treatment. Within a few weeks of treatment, most plants in the treated area are brown and dropping from the water column. In Kress Lake, an algal bloom was observed a few weeks after the herbicide treatment. This may have been caused by the nutrients released from the decaying plants. (Note: an algal bloom was also observed in August 2002, although no herbicide treatment had taken place for two years. Many lakes are naturally nutrient-enriched.) Sampling ten weeks after treatment showed mostly dead and decaying plants lying along the bottom and bright green healthy muskgrass populations. A year after treatment, the native plant community was recovering, but milfoil, though present, did not dominate the plant population.

Fish and Wildlife staff have been pleased with the results, indicating that anglers are now able to fish without tangling their gear in milfoil.

Follow-up:

This is potentially a new method available for the control of milfoil in heavily infested lakes. The results from Kress Lake have been excellent. The lake was treated in 2000 and no further treatment was needed in 2001 or 2002. At this stage of assessment, we do not know how often the lake will need to be treated to continue the suppression of milfoil.

Appropriateness for Lake Stevens:

Endothall is considered appropriate for use in Lake Stevens, though at approximately \$650 per acre is more costly than some other aquatic herbicides available for Eurasian watermilfoil control. The use of this herbicide will not eradicate milfoil from Lake Stevens, but it may help to keep milfoil levels under control.

References:

Parsons, J., B. Dickes, and A. Fullerton, 2001. Aquatic Plants Technical Assistance Program: 2001 Activity Report. Washington Department of Ecology

Skogerboe, J.G. and K.D. Getsinger. 2001. *Endothall species selectivity evaluation: southern latitude aquatic plant community*. J. Aquat. Plant Manage. 39:129-135.

Diquat Treatment

Diquat is applied as a liquid and is a fast-acting non-selective contact herbicide which destroys the vegetative part of the plant but does not kill the roots. Diquat is effective on a variety of submersed plants, including Eurasian watermilfoil, and also some types of filamentous algae. Diquat kills plants rapidly, potentially causing a depletion of oxygen and release of nutrients from plant decay into the water column. Typically diquat is used primarily for short term (one season) control of a variety of submersed aquatic plants. Herbicide drift is usually minimal and it can be used to treat specific areas of the water. However, diquat may be less effective if applied to murky or turbid waters or areas with dense algal blooms. Also, repeat applications may be necessary for season-long plant control. The Washington State Department of Ecology recently completed a risk assessment and an environmental impact statement for endothall. The risk assessment and the impact statement can be viewed at the following web address: http://www.ecy.wa.gov/programs/wq/pesticides/seis/risk_assess.html.

Waterbodies suitable for diquat treatment:

Treatments using diquat cannot be considered as a Eurasian watermilfoil eradication method. Diquat will suppress the growth of milfoil and most other native plants that receive treatment. Lakes and ponds considered suitable for diquat treatments are heavily infested with Eurasian watermilfoil. This method may be used where it is considered too expensive, or the waterbody is too large to use milfoil eradication strategies.

Although this product is categorized as a contact herbicide, diquat has been used in Hayden Lake, ID with some apparent systemic effect (Lamb, 2002). In this instance, Reward was applied by a diver or a "drop hose" to the lower third of plants in dense Eurasian watermilfoil beds. The diver used a wand and nozzle connected to a pressure tank onboard a nearby support boat to treat one acre, while the boat treatment involved holding the wand and nozzle down into the water while traveling across a two-acre bed. A follow-up diver inspection of these treatment areas one year later found only occasional Eurasian watermilfoil sprigs (new plants) in the diver-treated area and approximately one-half acre of live plants in the boat treatment area.

Diquat has slight toxicity to most animals and freshwater fish. It is slightly to highly toxic to aquatic invertebrates. However, the WDOE approved Diquat for use in nuisance and noxious weed control (WDOE, 2003) based on the completion of a Final Risk Assessment and the Final Supplemental Environmental Impact Statement for Diquat Bromide (WDOE, 2002b, c).

Special considerations:

Water use restrictions for the use of Diquat applications at a rate of two gallons Reward per surface acre (appropriate rate for Eurasian watermilfoil control) are three days for drinking water, one day for livestock drinking, three days for irrigation to turf and ornamental and five days for irrigation to food crops. There is no restriction for fishing or swimming in treated waters. Care must be taken with the application so that low oxygen conditions do not develop as plants decompose.

Any whole lake or widespread diquat herbicide treatment should be conducted under an

integrated aquatic vegetation management plan.

General impacts of diquat treatment:

Generally diquat is used to spot treat areas and therefore impacts are not widespread. As with endothall, most plants in the treated area are brown and dropping from the water column in a few weeks. It should be noted that decaying plants release nutrients, and lakes or ponds treated over a large area may be susceptible to excessive algae growth.

Follow-up:

This aquatic plant control method was approved for use in Washington in 2003 and is potentially a new method available for the control of milfoil in heavily infested lakes. Several lakes in western Washington including Plummer and Battleground lakes were treated with diquat in 2003, mainly to control Brazilian elodea. Monitoring results from those lakes should provide information on plant control effectiveness and residual herbicide amounts in the water.

Appropriateness for Lake Stevens:

Diquat is considered appropriate for use at Lake Stevens due to its effectiveness on Eurasian watermilfoil, rapid results, fewer restrictions than Endothall, and cost effectiveness compared with other aquatic herbicides. Diquat will not eradicate milfoil from lake Stevens so continued management in subsequent seasons would be necessary.

References:

Lamb, David. 2002. Integrated Aquatic Vegetation Management Plan for Sacheen Lake. Pend Oreille County, WA.

Washington Department of Ecology (WDOE). 2002b. Final Risk Assessment for Diquat Bromide. Publication No. 00-10-046. Olympia, WA.

Washington Department of Ecology (WDOE). 2002c. Final Supplemental Environmental Impact Statement Assessment for Diquat. Publication No. 00-10-052. Olympia, WA.

Washington Department of Ecology (WDOE). 2003. Minor Permit Modification for Permit No. WAG-994000, Aquatic Nuisance Plant and Algae Control NPDES General Permit; and Permit No. WAG-993000, Aquatic Noxious Weed Control NPDES General Permit regarding Conditions for use of Diquat. Olympia, WA.

Triclopyr:

This is a systemic herbicide with a water soluble triethylamine salt formulation containing three pounds of triclopyr acid equivalent per gallon. This is the first aquatic herbicide to receive registration since 1988 (SePRO, 2003a) became registered in Washington State in 2004 (Ecology, Undated).

Triclopyr is effective on broad-leafed (dicots) plants such as Eurasian watermilfoil and does not harm monocots. Therefore, it is used for the selective removal of many noxious aquatic weeds including Eurasian watermilfoil and purple loosestrife. Triclopyr is a liquid product with a contact time requirement of 24 to 48 hours and can be used to treat specific areas. Susceptible plants exhibit epinasty (bending and twisting of plant tissue) within one day after treatment and die shortly thereafter.

Triclopyr does not accumulate in lake sediments or bottom-feeding fish, and has a low toxicity potential (SePRO, 2003b). The primary means by which triclopyr breaks down is through Photodegradation, with a typical half-life of 0.5 to 3 days. Water-use restrictions likely will be reviewed prior to registration for use in Washington.

The advantages of using Triclopyr include: selective for broad-leaf plants (e.g. milfoil), only requires a short contact time, is systemic and has potential for long-term control. Some disadvantages of Triclopyr are that it is costly compared to other herbicides and it is not currently approved for use in Washington.

Appropriateness for Lake Stevens:

Triclopyr is very appropriate for use in Lake Stevens. It is similar in action to 2-4 D, though less toxic. At costs up to \$750 per acre, triclopyr can be more expensive than other herbicide and control techniques.

References:

Washington State Department of Ecology. Undated. Aquatic Plant Management: Aquatic Herbicides. Available at : <http://www.ecy.wa.gov/programs/wq/plants/management/aqua028.html>. (Accessed July 28,2010)

SePRO Corporation. 2003a. Product label for Renovate® Aquatic Herbicide. Carmel, IN.

SePRO Corporation. 2003b. Product information for Renovate Aquatic Herbicide. Internet website: http://www.sepro.com/pdf_lit/aquatics/Renovate_FAB.pdf.

Appendix C

Detailed Control Strategies Presented At Steering Committee Meeting 2

Treatment Scenario 1

Milfoil Removal by harvesting around docks and beaches

Areas Controlled:

Estimated 10 year cost: \$970,000

- Around Docks and boating lanes and public beaches (30 acres)

Control Timing and Techniques:

Year 1: Harvest areas around docks, and boat lanes (June)

Year 1: Harvest areas around docks, and boat lanes (August)

Years 2-10 Repeat Year 1 Scenario

Advantages

- No harmful chemicals used
- Immediate control
- Removes plants from lake (no decaying plants)
- Preserves certain beneficial use areas

Disadvantages

- Does not reduce the number of milfoil plants in the lake
- Minimal level and duration of control
- Cannot feasibly provide control for all problem areas
- Expensive
- Noisy
- Slow (only 6 acres a day can be harvested by a two machine team)
- Plant removal can be costly and logistically difficult

Treatment Scenario 1: Targeted Harvesting around Docks and Beaches							
	2011	2012	2013	2014	2015	2016	2017-2020
Targeted Harvesting (2 times per year)	\$90,000	\$90,000	\$90,000	\$100,000	\$100,000	\$100,000	\$400,000

Treatment Scenario 2

Milfoil Eradication with Fluridone, Granular Triclopyr, and Hand Pulling/Bottom Barrier

Areas Controlled:

Estimated 10 year cost: \$520,000

- All milfoil control Areas

Control Timing and Techniques:

Year 1:** Treat whole area with granular fluridone(controlled release pellets) to remove milfoil **(Four applications over one summer: Early May, June, July and August)

Year 2:** Treat areas larger or remaining dense patches with granular Triclopyr **(May, September)

Year 2:** Hand pull single plants or patches that can be pulled in < 1hr **(May, September)

Year 3:** Hand pull single plants or patches that can be pulled in < 1hr **(June)

Year 3:** Treat areas larger than can be hand pulled in 1hr with Triclopyr **(June)

Year 3:** Cover recurring patches with bottom barrier **(June)

***Years 4-10** Repeat Year 3 Scenario (Note that after 2 years bottom barriers may be moved from one location to another)*

Advantages

- Near eradication of milfoil
- Controls all weeds, including curly pondweed another potential problem plants in Lake Stevens
- No fish timing windows and very minimal toxicity risk for fish
- Fluridone is unlikely to require irrigation restrictions
- Herbicide use is reduced in successive years by utilizing hand pulling
- Slow acting herbicide will cause plants to die over a long period of time (less water quality concern)
- **Transition to triclopyr in following years as spot treatments will reduce impacts to other aquatic plants**

Disadvantages

- It may be difficult to maintain effective fluridone concentrations due to dilution
- Fluridone will kill beneficial plants as well as unwanted plants. This is one of the reasons we are recommending use of Triclopyr in following years.
- Near eradication goal **requires** frequent and costly surveys.

Treatment Scenario 2 (Fluridone, Triclopyr and Manual Methods)								
	2011	2012	2013	2014	2015	2016	2017-2020	10 Year Total
Initial Treatment (200 acres)	\$140,000							\$140,000
Diver Survey (\$4,000/day)	\$20,000	\$32,000	\$16,000	\$16,000	\$16,000	\$16,000	\$64,000	\$180,000
Notifications and Signage	\$2,000	\$2,000	\$2,000					\$6,000
Triclopyr Spot Treatments¹		\$24,000						\$24,000
Contingency Budget²		\$10,000	\$35,000	\$25,000	\$25,000	\$25,000	\$25,000	\$145,000
Estimated Annual Cost	\$162,000	\$68,000	\$53,000	\$41,000	\$41,000	\$41,000	\$89,000	\$495,000

1. Follow up treatment with triclopyr will be needed to combat patches of milfoil that survived the fluridone treatment. The cost estimate proposed here assumes a “very bad case scenario” where remaining patches would be scattered throughout the lake and almost 20% of the original treatment area would be treated with triclopyr.
2. The main purpose of the contingency budget is to allow for adaptability of the treatment plan. The specific treatment needs will be dictated by the results of each year’s diver survey(s). In years 2 and 3, at least some the contingency budget is likely to be needed for herbicide spot treatments. In later years it may be used for hand pulling, bottom barrier installation, or addressing other invasive plant concerns.

Treatment Scenario 3 (Preferred Scenario)

Milfoil Eradication with Triclopyr and Manual techniques

Areas Controlled:

Estimated 10 year cost: \$520,000

- Entire lake littoral (nearshore) zone

Control Timing and Techniques:

***Year 1:** Treat whole area with granular triclopyr to reduce milfoil (**Early May**)*

***Year 1:** Spot treat areas of milfoil growth with granular Triclopyr (**Early September**)*

***Year 2:** Treat areas larger than can be hand pulled in 1hr with Triclopyr (**May, September**)*

***Year 2:** Hand pull single plants that are discovered while doing the dive survey (**May, September**)*

***Year 3:** Hand pull single plants or patches that can be pulled in < 1hr (**June**)*

***Year 3:** Treat areas larger than can be hand pulled in 1hr with Triclopyr (**June**)*

***Year 3:** Cover recurrent patches with bottom barrier (**June**)*

***Years 4-10** Repeat Year 3 Scenario*

Advantages

- Near eradication of milfoil
- Fast acting herbicide (no need to maintain concentrations)
- No fish timing windows and less fish toxicity concerns than 2,4 D
- Triclopyr will not harm desirable plants (e.g. native elodea and najas)
- Granular herbicide allows for more precision targeting of treatment zones
- Herbicide use is reduced in successive years by utilizing hand pulling and bottom barriers

Disadvantages

- Triclopyr may give advantage to other unwanted plants (i.e. curly leaf pondweed) because it only affects milfoil.
- Near eradication goal requires frequent and costly surveys.
- 120 day irrigation restriction associated with Triclopyr use

Treatment Scenario 3 (Triclopyr and Manual Methods)								
	2011	2012	2013	2014	2015	2016	2017-2020	10 Year Total
Initial Treatment (200 acres)	\$140,000							\$140,000
Diver Survey (\$4,000/day)	\$20,000	\$32,000	\$16,000	\$16,000	\$16,000	\$16,000	\$64,000	\$180,000
Notifications and Signage	\$2,000	\$2,000	\$2,000					\$6,000
Triclopyr Spot Treatments¹	\$24,000							\$24,000
Contingency Budget²		\$35,000	\$35,000	\$25,000	\$25,000	\$25,000	\$25,000	\$170,000
Estimated Annual Cost	\$186,000	\$69,000	\$53,000	\$41,000	\$41,000	\$41,000	\$89,000	\$520,000

1. Follow up treatment with triclopyr will be needed in fall of the first season. The cost estimate proposed here assumes a “very bad case scenario” where remaining patches would be scattered throughout the lake and almost 20% of the original treatment area would be treated again
2. The main purpose of the contingency budget is to allow for adaptability of the treatment plan. The specific treatment needs will be dictated by the results of each year’s diver survey(s). In years 2 and 3, at least some the contingency budget is likely to be needed for herbicide spot treatments. In later years it may be used for hand pulling, bottom barrier installation, or addressing other invasive plant concerns.

Note: Scenario 3 is the selected scenario. Some of the cost estimates have been adjusted since this cost table was created. Please see Table 2 in the main text for the current cost estimate of the preferred scenario.

Appendix D

Pesticide Labels and Toxicity Information for Triclopyr, Fluridone, and Glyphosate

Specimen Label

Renovate® OTF

Aquatic Herbicide



Aquatic Sites: For control of emerged, submersed and floating aquatic weeds in the following aquatic sites: ponds; lakes; reservoirs; marshes; wetlands; impounded rivers, streams and other bodies of water that are quiescent; non-irrigation canals, seasonal irrigation waters and ditches which have little or no continuous outflow.

For use in New York State, comply with Section 24(c) Special Local Need labeling for Renovate® OTF, SLN NY-070004

Active Ingredient:

triclopyr: 3,5,6-trichloro-2-pyridinyloxyacetic acid, triethylamine salt. 14.0%
Other Ingredients 86.0%
TOTAL 100.0%
Acid equivalent: triclopyr - 10.0%.

Keep Out of Reach of Children

CAUTION/PRECAUCIÓN

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

Precautionary Statements

Hazards to Humans and Domestic Animals

Causes moderate eye irritation. Avoid contact with eyes or clothing.

USER SAFETY RECOMMENDATIONS

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing immediately if pesticide gets inside, then wash thoroughly and put on clean clothing.

First Aid

If in eyes

- Hold eye open and rinse slowly and gently with water for 15 - 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.
- Call a poison control center or doctor for treatment advice.

If on skin or clothing

- Take off contaminated clothing.
- Rinse skin immediately with plenty of water for 15 - 20 minutes.
- Call a poison control center or doctor for treatment advice.

If swallowed

- Call a poison control center or doctor immediately for treatment advice.
- Have person sip a glass of water if able to swallow.
- Do not induce vomiting unless told to do so by a poison control center or doctor.
- Do not give anything by mouth to an unconscious person.

If inhaled

- Move person to fresh air.
- If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible.
- Call a poison control center or doctor for further treatment advice.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. In case of emergency endangering health or the environment involving this product, call **INFOTRAC** at **1-800-535-5053**.

Notice: Read the entire label. Use only according to label directions. **Before using this product, read "Warranty Disclaimer", "Inherent Risks of Use", and "Limitation of Remedies" at end of label booklet. If terms are unacceptable, return at once unopened.**

If you wish to obtain additional product information, please visit our web site at **www.sepro.com**.

EPA Reg. No. 67690-42
FPL 011808

Renovate is a registered trademark of Dow AgroSciences LLC.
Manufactured by: **SePRO Corporation** 11550 North Meridian Street, Suite 600
Carmel, IN 46032 U.S.A.

or until triclopyr residue levels are determined by laboratory analysis, or other appropriate means of analysis, to be 1.0 ppb or less.

– **Irrigation Canals/Ditches:** Do not apply Renovate OTF to irrigation canals/ditches unless the 120 day restriction on irrigation water usage can be observed or triclopyr residue levels are determined by laboratory analysis, or other appropriate means of analysis, to be 1.0 ppb or less.

– **There is no restriction on use of treated water to irrigate established grasses.**

- **Do not** apply Renovate OTF directly to, or otherwise permit it to come into direct contact with grapes, tobacco, vegetable crops, flowers, or other desirable broadleaf plants, and do not permit dust to drift into these areas.
- **Do not** apply to salt water bays or estuaries.
- **Do not** apply directly to un-impounded rivers or streams.
- **Do not** apply on ditches or canals currently being used to transport irrigation water or that will be used for irrigation within 120 days following treatment or until triclopyr residue levels are determined to be 1.0 ppb or less.
- **Do not** apply where runoff water may flow onto agricultural land as injury to crops may result.

Grazing and Haying Restrictions:

Except for lactating dairy animals, there are no grazing restrictions following application of this product.

- **Grazing Lactating Dairy Animals:** Do not allow lactating dairy animals to graze treated areas until the next growing season following application of this product.
- **Do not** harvest hay for 14 days after application.
- Grazed areas of non-cropland and forestry sites may be spot treated if they comprise no more than 10% of the total grazable area.

Slaughter Restrictions: During the season of application, withdraw livestock from grazing treated grass at least 3 days before slaughter.

BEST MANAGEMENT PRACTICES FOR DRIFT MANAGEMENT

Equipment used in the application of Renovate OTF should be carefully calibrated to be sure it is working properly and delivering a uniform distribution pattern. Aerial application should be made only when the wind velocity is 2 to 10 mph.

Applications should be made only when there is little or no hazard for volatility or dust drift, and when application can maintain Renovate OTF placement in the intended area. Very small quantities of dust, which may not be visible, may seriously injure susceptible plants, and Renovate OTF may be blown outside of the intended treatment area under extreme conditions. Do not spread Renovate OTF when wind is blowing toward susceptible crops or ornamental plants that are near enough to be injured.

Avoiding drift at the application site is the responsibility of the applicator. The interaction of many equipment and weather related factors determine the potential for drift. The applicator is responsible for considering all these factors when making decisions.

Ground Application Equipment: To aid in reducing drift, Renovate OTF should be applied when wind velocity is low (follow state regulations; see *Sensitive Area* under *Aerial Drift Reduction Advisory* below) or using a slurry injection system.

AERIAL DRIFT REDUCTION ADVISORY

This section is advisory in nature and does not supersede the mandatory label requirements.

Application Height: Applications should not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces drift potential.

Swath Adjustment: When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by

ENVIRONMENTAL HAZARDS

Under certain conditions, treatment of aquatic weeds can result in oxygen depletion or loss due to decomposition of dead plants, which may cause fish suffocation. Therefore, to minimize this hazard **DO NOT** treat more than one-half (1/2) of the water area in a single operation and wait at least 10 days between treatments when susceptible plants are mature and have grown to the water's surface, or when the treatment would result in significant reductions in total plant biomass. Begin treatment along the shore and proceed outwards in bands to allow fish to move into untreated areas. Consult with the State agency for fish and game before applying to public water to determine if a permit is needed.

AGRICULTURAL CHEMICAL: Do not ship or store with food, feeds, drugs or clothing.

Directions for Use

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Read all *Directions for Use* carefully before applying.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation.

General Information

When applying this product follow all applicable use directions, precautions and limitations.

For Aquatic and Wetland Sites: Use Renovate OTF Granular herbicide for control of emerged, submersed and floating aquatic weeds in the following aquatic sites: ponds; lakes; reservoirs; marshes; wetlands; impounded rivers, streams and other bodies of water that are quiescent; non-irrigation canals, seasonal irrigation waters and ditches which have little or no continuous outflow.

Obtain Required Permits: Consult with appropriate state or local water authorities before applying this product in and around public waters. State or local public agencies may require permits.

Recreational Use of Water in Treatment Area: There are no restrictions on use of water in the treatment area for recreational purposes, including swimming and fishing.

Livestock Use of Water from Treatment Area: There are no restrictions on livestock consumption of water from the treatment area.

GENERAL USE PRECAUTIONS AND RESTRICTIONS

Chemigation: Do not apply this product through any type of irrigation system.

Irrigation: Water treated with Renovate OTF may not be used for irrigation purposes for 120 days after application or until triclopyr residue levels are determined by laboratory analysis, or other appropriate means of analysis, to be 1.0 ppb or less. This label describes both required and recommended uses of a chemical analysis for the active ingredient, triclopyr. SePRO Corporation recommends the use of an Enzyme-Linked Immunoassay (ELISA) test for the determination of the active ingredient concentration in water. Contact SePRO Corporation for the incorporation of this analysis in your treatment program. Other proven chemical analysis for the active ingredient may also be used. The ELISA analysis is referenced in this label as the preferred method for the rapid determination of the concentration of the active ingredient in the water.

- **Seasonal Irrigation Waters:** Renovate OTF may be applied during the off-season to surface waters that are used for irrigation on a seasonal basis, provided that there is a minimum of 120 days between Renovate OTF application and the first use of treated water for irrigation purposes

adjusting the path of the aircraft upwind. Swath adjustment distance should increase, with increasing drift potential (e.g. higher wind).

Wind: Drift potential is lowest between wind speeds of 2 - 10 mph (follow state regulations). However, many factors, including equipment type, determine drift potential at any given speed. Application should be avoided below 2 mph due to variable wind direction and high inversion potential.
Note: Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect drift.

Sensitive Areas: Renovate OTF should only be applied when the potential for drift to adjacent sensitive areas (e.g., residential areas, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

AQUATIC WEEDS CONTROLLED BY RENOVATE OTF

alligatorweed	pennywort
American lotus	smartweed
bladderwort	water chestnut ^{†,††}
Eurasian watermilfoil	yellow water lily (<i>Nuphar</i> spp., spatterdock)
milfoil species	white water lily (<i>Nymphaea</i> spp.)
parrotfeather ^{††}	water primrose (<i>Ludwigia</i> spp.)
pickerelweed	watershield (<i>Brasenia</i> spp.)

[†] Not for use in California.

^{††} Retreatment may be needed to achieve desired level of control.

Application Methods

Surface Application

Use a mechanical spreader such as a fertilizer spreader or mechanical seeder, or similar equipment capable of uniformly applying Renovate OTF. Before spreading any product, carefully calibrate the application equipment. When using boats and power equipment, you must determine the proper combination of (1) boat speed, (2) rate of delivery from the spreader, and (3) width of swath covered by the granules.

Use the following formula to calibrate the spreader's delivery in pounds of Renovate OTF per minute:

$$\frac{\text{miles per hour} \times \text{swath width (feet)} \times \text{pounds per acre}}{495} = \text{pounds per minute}$$

Aerial Application (Helicopter Only)

Ensure uniform application. All equipment should be properly calibrated using blanks with similar physical characteristics to Renovate OTF. To avoid streaked, uneven or overlapped application, use an appropriate tracking device (e.g. GPS). Refer to the *Aerial Drift Reduction Advisory* section of this label for additional precautions and instructions for aerial application.

Floating and Emerged Weeds

For control of water lily's (*Nymphaea* spp. and *Nuphar* spp.), watershield (*Brasenia* spp.), and other susceptible emerged and floating herbaceous weeds, apply 1.0 to 2.5 ppm a.e. triclopyr per acre. Apply when plants are actively growing.

Use higher rates in the rate range when plants are mature, when the weed mass is dense, in areas of greater water exchange, or for difficult to control species. Repeat as necessary to control regrowth, but do not exceed a total of 2.5 ppm a.e. triclopyr for the treatment area per annual growing season.

Submersed Weeds

For control of Eurasian watermilfoil (*Myriophyllum spicatum*) and other susceptible submersed weeds in ponds, lakes, reservoirs, impounded rivers, streams, and other bodies of water that are quiescent; non-irrigation canals, and seasonal irrigation waters, or ditches that have little or no continuous outflow, apply Renovate OTF using mechanical or portable granule spreading equipment. Rates should be selected according to the rate chart below to provide a triclopyr concentration of 0.50 to 2.5 ppm a.e. in treated water. Use of higher rates in the rate range is recommended in areas of greater water exchange. These areas may require a repeat application. However, total application

of Renovate OTF **Page 168** must not exceed an application rate of 2.5 ppm a.e. triclopyr for the treatment area per annual growing season.

For optimal control, apply when Eurasian watermilfoil or other submersed weeds are actively growing.

Concentration of Triclopyr Acid in Water (ppm a.e.)

Avg. Water Depth (ft)	Pounds Renovate OTF / acre					
	0.5 ppm	0.75 ppm	1.0 ppm	1.5 ppm	2.0 ppm	2.5 ppm
1	14	20	27	41	54	67
2	27	41	54	81	108	135
3	41	61	81	122	162	202
4	54	81	108	162	216	270

For applications greater in depth than 4 feet, when targeting difficult to control species and/or in sites with high dilution potential, the following formula should be used to calculate applications rates should greater than 270 pounds of Renovate OTF be needed to achieve desired weed control.
NOTE: Do not exceed 2.5 ppm a.e. triclopyr for the treatment area per annual growing season.

average depth x target ppm x 27 = pounds of Renovate OTF per acre

Example Calculation:

6 foot average depth x 2.5 ppm x 27 = 405 pounds of Renovate OTF per acre

SMALL SITE (LESS THAN 1/2 ACRE) / SPOT TREATMENT APPLICATION

For small treatment sites of 1/2 acre or less use the rate chart below to determine the application rate depending on average water depth to achieve a concentration of 1.25 to 2.5 ppm a.e. **Do not exceed 2.5 ppm a.e. triclopyr** for the treatment area per annual growing season. Use higher rates in small treatment areas and in areas prone to higher dilution and for heavy weed infestation. Use the lower rates for spot treatment application of areas less prone to dilution and lighter weed infestations. For best results, split the total application rate into three equal applications 8 to 12 hours apart. Apply when water is calm.

Example: A 100 ft. by 40 ft. lakeshore swimming area with a 4 ft. average depth, heavily infested with Eurasian watermilfoil

Step 1: Determine the area to be treated in square feet (ft²) by multiplying the length of the area by the width.
– 100 ft. x 40 ft. = 4,000 ft²

Step 2: Determine the amount of Renovate OTF to be used by consulting the Renovate OTF Rate Chart for Areas Less than 1/2 Acre.
– Use 24.7 lbs. of Renovate OTF total based on 4 foot average depth in Rate Chart below.

Step 3: Apply Renovate OTF uniformly over weeds in treatment site in three equal applications of 8.2 lbs. each, 8 - 12 hours apart.

Renovate OTF Rate Chart for Areas Less than 1/2 Acre

Area (ft ²)	Pounds Renovate OTF			
	3 foot average depth		4 foot average depth	
	1.25 ppm a.e.	2.5 ppm a.e.	1.25 ppm a.e.	2.5 ppm a.e.
500	1.2	2.3	1.5	3.0
1,000	2.3	4.6	3.1	6.1
4,000	9.3	18.6	12.4	24.7
10,000	23.2	46.5	31.0	61.9
20,000	46.5	93.0	62.0	123.9

For applications with an area or depth not included in the above chart, the following formula should be used to calculate application rates.

area (ft²)/43,560 x average depth x target ppm x 27 = pounds of Renovate OTF

Example Calculation:

8,250 ft²/43,560 x 4 foot average depth x 1.25 ppm x 27 = 25.6 pounds of Renovate OTF

Small treatment application of Renovate OTF is recommended with waterproof gloves or a hand spreader to uniformly distribute flakes on target weeds.

Precautions for Potable Water Intakes:

For applications of Renovate OTF to control floating, emersed, and submersed weeds in sites that contain a functioning potable water intake for human consumption, see the chart below to determine the minimum setback distances of the application from the functioning potable water intakes.

Concentration of Triclopyr Acid in Water (ppm a.e.)					
Area Treated (acres)	Required Setback Distance (ft) from Potable Water Intake				
	0.75 ppm	1.0 ppm	1.5 ppm	2.0 ppm	2.5 ppm
<4	300	400	600	800	1000
>4 - 8	420	560	840	1120	1400
>8 - 16	600	800	1200	1600	2000
>16 - 32	780	1040	1560	2080	2600
>32 acres, calculate a setback using the formula for the appropriate rate	Setback (ft) = $\frac{(800 \times \ln(\text{acres}) - 160)}{3.33}$	Setback (ft) = $\frac{(800 \times \ln(\text{acres}) - 160)}{2.50}$	Setback (ft) = $\frac{(800 \times \ln(\text{acres}) - 160)}{1.67}$	Setback (ft) = $\frac{(800 \times \ln(\text{acres}) - 160)}{1.25}$	Setback (ft) = $\frac{(800 \times \ln(\text{acres}) - 160)}{1.00}$

Note: ln = natural logarithm

Example Calculation 1:

to apply 2.5 ppm Renovate OTF to 50 acres:

$$\begin{aligned} \text{Setback in feet} &= (800 \times \ln(50 \text{ acres}) - 160) \\ &= (800 \times 3.912) - 160 \\ &= 2970 \text{ feet} \end{aligned}$$

Example Calculation 2:

to apply 0.75 ppm Renovate OTF to 50 acres:

$$\begin{aligned} \text{Setback in feet} &= \frac{(800 \times \ln(50 \text{ acres}) - 160)}{3.33} \\ &= \frac{(800 \times 3.912) - 160}{3.33} \\ &= 892 \text{ feet} \end{aligned}$$

Note: Existing potable water intakes which are no longer in use, such as those replaced by potable water wells or connections to a municipal water system, are not considered to be functioning potable water intakes.

To apply Renovate OTF around and within the distances noted above from a functioning potable water intake, the intake must be turned off until the triclopyr level in the intake water is determined to be 0.4 parts per million (ppm) or less by laboratory analysis or immunoassay.

WETLAND SITES

Wetlands include flood plains, deltas, marshes, swamps, bogs, and transitional areas between upland and lowland sites. Wetlands may occur within forests, wildlife habitat restoration and management areas and similar sites as well as areas adjacent to or surrounding domestic water supply reservoirs, lakes and ponds.

For control of emersed, floating or submersed aquatic weeds in wetland sites, follow use directions and application methods associated with the *Floating and Emersed Weeds* or *Submersed Weeds* sections on this label.

Use Precautions

Minimize unintentional application to open water when treating target vegetation in wetland sites. **Note:** Consult local public water control authorities before applying this product in and around public water. Permits may be required to treat such areas.

IF ANY CONTENT ON THIS LABEL IS NOT UNDERSTOOD, OR YOU NEED FURTHER ASSISTANCE, CONTACT A SEPRO AQUATIC SPECIALIST WITH QUESTIONS SPECIFIC TO YOUR APPLICATION.

Terms and Conditions of Use

If terms of the following *Warranty Disclaimer*, *Inherent Risks of Use*, and *Limitation of Remedies* are not acceptable, return unopened package at once to the seller for a full refund of purchase price paid. Otherwise, use by the buyer or any other user constitutes acceptance of the terms under *Warranty Disclaimer*, *Inherent Risks of Use* and *Limitations of Remedies*.

Warranty Disclaimer

SePRO Corporation warrants that the product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. SEPRO CORPORATION MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

Inherent Risks of Use

It is impossible to eliminate all risks associated with use of this product. Plant injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label such as unfavorable temperatures, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner of application, or other factors, all of which are beyond the control of SePRO Corporation as the seller. To the extent permitted by applicable law all such risks shall be assumed by buyer.

Limitation of Remedies

To the fullest extent permitted by law, SePRO Corporation shall not be liable for losses or damages resulting from this product (including claims based on contract, negligence, strict liability, or other legal theories) shall be limited to, at SePRO Corporation's election, one of the following:

1. Refund of purchase price paid by buyer or user for product bought, or
2. Replacement of amount of product used.

SePRO Corporation shall not be liable for losses or damages resulting from handling or use of this product unless SePRO Corporation is promptly notified of such losses or damages in writing. In no case shall SePRO Corporation be liable for consequential or incidental damages or losses.

The terms of the *Warranty Disclaimer* above and this *Limitation of Remedies* cannot be varied by any written or verbal statements or agreements. No employee or sales agent of SePRO Corporation or the seller is authorized to vary or exceed the terms of the *Warranty Disclaimer* or *Limitations of Remedies* in any manner.

Storage and Disposal

Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available. Do not contaminate water, food, or feed by storage and disposal. Open dumping is prohibited.

Pesticide Storage: Store in original container. Do not store near food or feed. In case of leak or spill, contain material and dispose as waste.

Pesticide Disposal: Wastes resulting from the use of this product must be disposed of on site or at an approved waste disposal facility.

Container Disposal (Plastic Bags): Completely empty bag into application equipment. Then dispose of empty bag in a sanitary landfill or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

General: Consult federal, state, or local disposal authorities for approved alternative procedures.

Triclopyr

What is Triclopyr and how does it work.

Triclopyr is a fast acting systemic herbicide that is selective in controlling dicots (flowering plants that have two seed leaves) such as Eurasian watermilfoil. Other aquatic plants such as coontail, bladderwort, and water lilies are also somewhat susceptible to Triclopyr treatments. Triclopyr is available in both solid and liquid formulas under a variety of names. Triclopyr works by mimicking the plant growth hormone auxin. When dicots are exposed to high concentrations of auxin their stems twist and elongate in an uncontrolled fashion which causes the plants to die. Triclopyr is not effective against monocots such as Brazilian elodea, because pathway that is affected by Triclopyr in dicots is different in monocots.

What plants are controlled by Triclopyr?

Aquatic Weeds

alligatorweed	milfoil species	pickerelweed
American lotus	nuphar (spatterdock)	purple loosestrife
American frogbit	parrotfeather†	waterhyacinth
aquatic sodaapple	pennywort	waterlily
Eurasian watermilfoil	phragmites	watershield
		water primrose

Is Triclopyr safe to use?

Triclopyr is thought to be relatively safe for humans and the environment. According to the EPA factsheet, Triclopyr was found to be slightly toxic for birds, and practically non-toxic for mammals, amphibians and freshwater fish and insects. Triclopyr is not known to cause any effects due to chronic exposure, but tests in rats were inconclusive, suggesting that there may be some risk. Triclopyr poses a slightly higher environmental risk because it does not bind to soil particles like many other herbicides so it is more mobile and persistent in soils. However, in the water column it is broken down relatively quickly by sunlight, and testing of wells in areas where triclopyr was used did not exhibit contamination.

What use or timing restrictions are there?

Triclopyr is not subject to any fishing restriction, or fish timing windows. Swimming is prohibited for 12 hours in the treated areas. Application may not exceed 2.5 ppm for the treatment area in a single season. Water may not be used for irrigation within 120 days of application or if concentrations are above 1 ppb. As with any aquatic herbicide, proper permits need to be obtained, and Fluridone can only be applied by a Washington state licensed applicator.

How much does Triclopyr cost?

As with any aquatic herbicide there are many factors that can affect the overall application cost. However a reasonable estimate for planning purposes is \$600 per acre.

Are there any downsides to using Triclopyr?

Triclopyr is only affective against milfoil and other dicots. If there are other invasive plants in the area, such as Brazilian elodea, that are not affected by Triclopyr, then use of this herbicide can give them the opportunity to invade the area that was occupied by the milfoil. Brazilian elodea is equally problematic, and equally difficult to control, so using Triclopyr as a sole control strategy could potentially trade a milfoil problem for an elodea problem.

Some additional materials on triclopyr:

National Pesticide Information Center Factsheet

<http://npic.orst.edu/factsheets/triclogen.pdf>

Washington Department of Ecology Aquatic Herbicide Page

<http://www.ecy.wa.gov/programs/wq/plants/management/aqua028.html>

University of Florida Aquatic Plant Management website

<http://plants.ifas.ufl.edu/guide/sup3herb.html>

NPIC General Fact Sheets are designed to answer questions that are commonly asked by the general public about pesticides that are regulated by the U.S. Environmental Protection Agency (U.S. EPA). This document is intended to be helpful to professionals and to the general public for making decisions about pesticides.

National
Pesticide
Information
Center

Triclopyr

(General Fact Sheet)

For less general information, please refer to the Technical Fact Sheet.

The Pesticide Label: Labels provide directions for the proper use of a pesticide product. *Be sure to read the entire label before using any product.* Signal words, listed below, are found on the front of each product label and indicate the product's potential hazard.

CAUTION - low toxicity

WARNING - moderate toxicity

DANGER - high toxicity

What is triclopyr?

- Triclopyr is an herbicide, which is a chemical used to control plants (1).
- Triclopyr was first registered in 1979. Triclopyr is currently registered for use on rice, pasture and rangeland, rights-of-way, forests, and lawns (1).
- The majority of triclopyr products carry a Signal Word of Caution, but some products carry Danger or Warning signal words (2). See **The Pesticide Label** box.

How is triclopyr used?

- Triclopyr is used for the control of undesirable woody and herbaceous weeds (1).
- Triclopyr is sold predominately as soluble or emulsifiable concentrates, ready-to-use liquids, granulars, wettable powders, pellets, or formulation intermediates (1).

Herbicide selectivity: Some herbicides have the ability to kill certain plants without harming others. These are called selective herbicides. Resistant plants can survive by metabolizing the herbicide or not absorbing it. Often, a crop plant will be more tolerant of a herbicide than the weeds around it.

What are some products that contain triclopyr?

- Garlon, Turflon, Pathfinder, Access, Brush-B-Gon, Confront, Crossbow (2).
- Products that contain triclopyr often contain other herbicide active ingredients such as 2,4-D and clopyralid (2).

How does triclopyr work?

- Triclopyr is a selective herbicide that mimics the effects of plant hormones (3). See **Herbicide selectivity** box.

How toxic is triclopyr?

- Triclopyr is low in toxicity when eaten by animals (1). See **Toxicity Category** box.
- Triclopyr is mildly irritating to corrosive to the eyes (1). See **Exposure** box.
- Triclopyr is non-irritating to the skin of rabbits; however, skin sensitization occurs when triclopyr is applied to the skin of guinea pigs (1).
- Inhaled triclopyr is low in toxicity to rats (1).

Signs of Toxicity - Animals

- Responses from animals fed triclopyr range from no significant changes to changes in blood chemistry and decreases in body weight and food consumption. There is an increase in liver weight and a degeneration of sections of the kidney in some test animals, depending on the amount and length of exposure (1).

Signs of Toxicity - Humans

- Triclopyr is poorly absorbed through the skin (4).
- No reports of humans poisoned by eating triclopyr were found.

Does triclopyr cause cancer?

Animals

- Researchers observed no tumors in male rats and mice when fed triclopyr. However, there was a significant increase in breast tumors in the female animals fed triclopyr (1).

Humans

- The U.S. EPA has classified triclopyr as a group D chemical, that is, not classifiable as to human carcinogenicity (1). See **Cancer** box.

Does triclopyr cause reproductive problems or birth defects?

Animals

- Triclopyr has low potential for reproductive problems or birth defects in the rabbit and rat, even when the level of exposure is toxic to the mothers (1, 5).

Humans

- No data was found on human reproductive problems or birth defects related to triclopyr exposure.

Exposure: Effects of triclopyr on human health and the environment depend on how much triclopyr is present and the length and frequency of exposure. Effects also depend on the health of a person and/or certain environmental factors.

Toxicity Category (Signal Word)

	High Toxicity (<i>Danger</i>)	Moderate Toxicity (<i>Warning</i>)	Low Toxicity (<i>Caution</i>)	Very Low Toxicity (<i>Caution</i>)
Oral LD50	Less than 50 mg/kg	50 - 500 mg/kg	500 - 5000 mg/kg	Greater than 5000 mg/kg
Dermal LD50	Less than 200 mg/kg	200 - 2000 mg/kg	2000 - 5000 mg/kg	Greater than 5000 mg/kg
Inhalation LC50 - 4hr	Less than 0.05 mg/l	0.05 - 0.5 mg/l	0.5 - 2 mg/l	Greater than 2 mg/l
Eye Effects	Corrosive	Irritation persisting for 7 days	Irritation reversible within 7 days	Minimal effects, gone within 24 hrs
Skin Effects	Corrosive	Severe irritation at 72 hours	Moderate irritation at 72 hours	Mild or slight irritation

U.S. Environmental Protection Agency, Office of Pesticide Programs, Label Review Manual, Chapter 7: Precautionary Labeling
<http://www.epa.gov/oppfod01/labeling/lrm/chap-07.htm>

Cancer: The U.S. EPA has strict guidelines that require testing of pesticides for their potential to cause cancer. These studies involve feeding laboratory animals large *daily* doses of the pesticide over most of the lifetime of the animal. Based on these tests, and any other available information, EPA gives the pesticide a rating for its potential to cause cancer in humans. For example, if a pesticide does not cause cancer in animal tests, then the EPA considers it unlikely the pesticide will cause cancer in humans. Testing for cancer is not done on human subjects.

Are there other effects of long-term exposure to triclopyr?

Animals

- Triclopyr fed to animals for extended periods of time causes changes in the liver and kidneys (1).

Humans

- No data was found on the long-term effects of triclopyr on humans.

Does triclopyr break down and leave the body?

Animals

- The half-life of triclopyr in animals ranges from 3.6 to 7.2 hours (1, 6). See **Half-life** box.
- Rats eating triclopyr eliminate 94 to 97% in their urine or feces within 3 days (7).

Humans

- When six human volunteers ingested triclopyr, more than 80% was recovered in the urine within 2 days. The elimination half-life of triclopyr was 5.1 hours in these human volunteers (4).

What happens to triclopyr indoors?

- No data was found on the break down of triclopyr indoors.

What happens to triclopyr outdoors?

Soil

- Triclopyr breaks down into several other compounds before ultimately breaking down to carbon dioxide (CO₂) (1).
- Triclopyr has a half-life in soil ranging from 1.1 to 90 days (1, 8). See **Half-life** box.
- Triclopyr can move through soil and has the potential to contaminate groundwater (9).

Water

- In water, triclopyr is mainly broken down by exposure to sunlight. The half-life of triclopyr in water ranges from 1 to 10 days depending on water conditions (1, 10).

Air

- No data was found on fate of triclopyr in the air.

Plants

- Triclopyr's half-life in plants ranges from 3 to 10 days (3).

Does triclopyr affect wildlife?

Birds

- Triclopyr is slightly to practically non-toxic to birds (1, 11).

Half-life: the time required for half of the compound to degrade.

1 half-life	=	50% remaining
2 half-lives	=	25% remaining
3 half-lives	=	12% remaining
4 half-lives	=	6% remaining
5 half-lives	=	3% remaining

The amount of chemical remaining after a half-life will always depend on the amount of the chemical present initially.

Fish

- Triclopyr ranges from practically non toxic to highly toxic to fish, depending on the fish species and the triclopyr formulation (1).
- Triclopyr is practically non-toxic to moderately toxic to waterfleas, depending on the formulation (1).
- Triclopyr is practically non-toxic to highly toxic to several water insects, depending on the species (1).

Bees

- Triclopyr is practically non-toxic to bees (1).

Date reviewed: September, 2002

For more information contact: NPIC

Oregon State University, 333 Weniger Hall, Corvallis, Oregon 97331-6502.

Phone: 1-800-858-7378 Fax: 1-541-737-0761 Email: npic@ace.orst.edu

NPIC at <http://npic.orst.edu/> EXTOTOXNET at <http://ace.orst.edu/info/extotoxnet/>

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Triclopyr Questions and Answers

These questions were submitted by the public. The questions were answered by a team of experts.

1. What is triclopyr?

Triclopyr (*pronounced tri-clo-peer*) is an herbicide that can control infestations of Eurasian watermilfoil and other broad-leaf water plants. Eurasian watermilfoil is more sensitive to triclopyr than many native aquatic species including coontail, rushes and cattails. Triclopyr can therefore be used at label concentrations to remove Eurasian watermilfoil without killing many native plants. One triclopyr product is currently registered and marketed for aquatic weeds - Renovate 3™.

2. There are two types of triclopyr. Which one is registered for aquatic use? What distinguishes these two types of triclopyr from each other?

Renovate 3™ (triethylamine salt of triclopyr – 3 lb/gal acid equivalent) is the only formulation of triclopyr registered by the US EPA as an aquatic herbicide. The other formulation Garlon 4 is a butoxyethyl ester formulation with 4 lb/gal acid equivalent and this formulation is not registered for aquatic use.

3. Has a full risk assessment been performed on triclopyr? If so, by whom?

An Environmental Impact Statement (EIS) has been completed by the Washington Department of Ecology and a full risk assessment was conducted by Ecology and formed the basis for the EIS.

4. How toxic is triclopyr to humans?

Concentrated triclopyr products are corrosive and can cause skin irritation and irreversible eye damage if splashed in the eye. However, only dilute amounts of triclopyr are needed to kill Eurasian watermilfoil. These dilute concentrations have not been shown to cause skin irritation or other health effects. Triclopyr is not well absorbed through skin. If ingested, research has shown that low doses of triclopyr are rapidly excreted in humans and are unlikely to accumulate in human tissue or cause adverse effects.

In natural waters, the initial breakdown products of triclopyr are TCP and TMP. Tests in laboratory animals on both these metabolites have shown that their toxicity to mammals is less than or equal to triclopyr. These metabolites are relatively short-lived in the environment. Complete breakdown of triclopyr results in carbon dioxide, oxamic acid, and other low molecular weight carboxylic acids.

Triclopyr is not considered to be a cause of cancer, birth defects, or genetic mutations. Nor is it considered likely to cause systemic, reproductive, or

Specimen Label

Sonar^{*} PR Aquatic Herbicide



An herbicide for management of aquatic vegetation in fresh water ponds, lakes, reservoirs, potable water sources, drainage canals, irrigation canals and rivers.

Active Ingredient

Fluridone:

1-methyl-3-phenyl-5-[3-(trifluoromethyl)phenyl]-4(1H)-pyridinone 5.0%

Other Ingredients 95.0%

TOTAL 100.0%

Contains 0.05 pound active ingredient per pound.

Precautionary Statements

Hazards to Humans and Domestic Animals

Keep Out of Reach of Children CAUTION / PRECAUCIÓN

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

Harmful if Swallowed, Absorbed Through Skin, or if Inhaled.
Avoid breathing of dust or contact with skin, eyes or clothing.
Wash thoroughly with soap and water after handling.
Remove contaminated clothing and wash before reuse.

ENVIRONMENTAL HAZARDS

Follow use directions carefully so as to minimize adverse effects on non-target organisms. Trees and shrubs growing in water treated with Sonar PR may occasionally develop chlorosis. Do not apply in tidewater/brackish water. Lowest rates should be used in shallow areas where the water depth is considerably less than the average depth of the entire treatment site, for example, shallow shoreline areas.

First Aid

If in eyes

- Hold eye open and rinse slowly and gently with water for 15 - 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.
- Call a poison control center or doctor for treatment advice.

If on skin or clothing

- Take off contaminated clothing.
- Rinse skin immediately with plenty of water for 15 - 20 minutes.
- Call a poison control center or doctor for treatment advice.

If swallowed

- Call a poison control center or doctor immediately for treatment advice.
- Have person sip a glass of water if able to swallow.
- Do not induce vomiting unless told to do so by a poison control center or doctor.
- Do not give anything by mouth to an unconscious person.

If inhaled

- Move person to fresh air.
- If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible.
- Call a poison control center or doctor for further treatment advice.

EMERGENCY NUMBER

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. For medical emergencies involving this product, call **1-800-535-5053**.

Notice: Read the entire label before using. Use only according to label directions. **Before buying or using this product, read Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies** inside label booklet.

For additional information on our products, please visit www.sepro.com.

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FPL081808

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SePRO Corporation 11550 North Meridian Street, Suite 600, Carmel, IN 46032 U.S.A.

Directions for Use

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

Read all directions carefully before applying Sonar PR.

GENERAL INFORMATION

Sonar PR herbicide is a selective systemic aquatic herbicide for management of aquatic vegetation in fresh water ponds, lakes, reservoirs, drainage canals, irrigation canals, and rivers. Sonar PR is a pelleted formulation containing 5% fluridone. Sonar PR is absorbed from water by plant shoots and from hydrosol by the roots of aquatic vascular plants. It is important to maintain Sonar PR in contact with the target plants for as long as possible. Rapid water movement or any condition which results in rapid dilution of Sonar PR in treated water will reduce its effectiveness.

In susceptible plants, Sonar PR inhibits the formation of carotene. In the absence of carotene, chlorophyll is rapidly degraded by sunlight. Herbicidal symptoms of Sonar PR appear in seven to ten days and appear as white (chlorotic) or pink growing points. Under optimum conditions 30 to 90 days are required before the desired level of aquatic weed management is achieved with Sonar PR. Species susceptibility to Sonar PR may vary depending on time of year, stage of growth and water movement. For best results, apply Sonar PR prior to initiation of weed growth or when weeds begin active growth. Application to mature target plants may require an application rate at the higher end of the specified rate range and may take longer to control.

Sonar PR is not corrosive to application equipment.

The label provides recommendations on the use of a chemical analysis for the active ingredient. SePRO Corporation recommends the use of an Enzyme-Linked Immunoassay (ELISA Test) for the determination of the active ingredient concentration in the water. Contact SePRO Corporation to incorporate this test, known as a FastEST,* into your treatment program. Other proven chemical analyses for the active ingredient may also be used. The chemical analysis, a FastEST, is referenced in this label as the preferred method for the rapid determination of the concentration of the active ingredient in the water.

Application rates are provided in pounds of Sonar PR to achieve a desired concentration of the active ingredient in parts per billion (ppb). **The maximum application rate or sum of all application rates is 90 ppb in ponds and 150 ppb in lakes and reservoirs per annual growth cycle.** This maximum concentration is the amount of product calculated as the target application rate, NOT determined by testing the residues of the active ingredient in the treated water.

GENERAL USE PRECAUTIONS

- **Obtain required permits:** Consult with appropriate state or local water authorities before applying this product. Permits may be required by state or local public agencies.
- **NEW YORK STATE:** Application of Sonar PR is not permitted in waters less than two (2) feet deep.
- **Hydroponic Farming:** Do not use Sonar PR treated water for hydroponic farming.
- **Greenhouse and Nursery Plants:** Do not use Sonar PR treated water for irrigating greenhouse or nursery plants unless a FastEST assay has been run and confirmed that residues are less than 1 ppb.
- **Water use restrictions following applications with Sonar PR (Days)**

Application Rate	Drinking†	Fishing	Swimming	Livestock/Pet Consumption	Irrigation††
Maximum Rate (150 ppb) or less	0	0	0	0	See irrigation instructions below

† Note below, under *Potable Water Intakes*, the information for application of Sonar PR within 1/4 miles (1,320 feet) of a functioning potable water intake.

†† Note below, under *Irrigation*, specific time frames or fluridone residues that provide the widest safety margin for irrigating with fluridone treated water.

- **Potable Water Intakes:** Concentrations of the active ingredient fluridone up to 150 ppb are allowed in potable water sources; however, in lakes and reservoirs or other sources of potable water, **DO NOT APPLY** Sonar PR at application rates greater than 20 ppb within one-fourth (1/4) mile (1,320 feet) of any functioning potable water intake. At application rates of 8 - 20 ppb, Sonar PR **MAY BE APPLIED** where functioning potable water intakes are present. **Note: Existing potable water intakes which are no longer in use, such as those replaced by connections to potable water wells or a municipal water system, are not considered to be functioning potable water intakes.**
- **Irrigation:** Irrigation with Sonar PR treated water may result in injury to the irrigated vegetation. Follow these precautions and inform those who irrigate from areas treated with Sonar PR of the irrigation time frames or water FastEST assay requirements presented in the table below. These time frames and a FastEST assay recommendations are suggestions which should be followed to reduce the potential for injury to vegetation irrigated with water treated with Sonar PR. Greater potential for crop injury occurs where Sonar PR treated water is applied to crops grown on low organic and sandy soils.

Hydrilla (*Hydrilla verticillata*)Naiad (*Najas* spp.)[†]Pondweed (*Potamogeton* spp., except Illinois pondweed)[†]Watermilfoil (*Myriophyllum* spp. except variable-leaf milfoil)**Shoreline Grasses:**Paragrass (*Urochloa mutica*)

¹ Species denoted by a dagger (†) are native plants that are often tolerant to fluridone at lower use rates. Please consult an aquatic specialist for recommended Sonar PR use rates (not to exceed maximum labeled rates) when selective control of exotic species is desired.

VASCULAR AQUATIC PLANTS PARTIALLY CONTROLLED BY SONAR PR PRECISION RELEASE:

Submersed Plants:Illinois pondweed (*Potamogeton illinoensis*)Limnophila (*Limnophila sessiliflora*)Tapegrass, American eelgrass (*Vallisneria americana*)Watermilfoil—variable-leaf (*Myriophyllum heterophyllum*)**Emerald Plants:**Alligatorweed (*Alternanthera philoxeroides*)American lotus (*Nelumbo lutea*)Cattail (*Typha* spp.)Creeping waterprimrose (*Ludwigia peploides*)Parrotfeather (*Myriophyllum aquaticum*)Smartweed (*Polygonum* spp.)Spatterdock (*Nuphar luteum*)Spikerush (*Eleocharis* spp.)Waterlily (*Nymphaea* spp.)Waterpurslane (*Ludwigia palustris*)Watershield (*Brasenia schreberi*)**Floating Plants:**Salvinia (*Salvinia* spp.)**Shoreline Grasses:**Barnyardgrass (*Echinochloa crusgalli*)Giant cutgrass (*Zizaniopsis miliacea*)Reed canarygrass (*Phalaris arundinaceae*)Southern watergrass (*Hydrochloa carolinensis*)Torpedograss (*Panicum repens*)

Days After Application

Application Site	Established Tree Crops	Established Row Crops/ Turf/Plants	Newly Seeded Crops/Seedbeds or Areas to be Planted Including Overseeded Golf Course Greens
Ponds and Static Canals [†]	7	30	FastEST assay required
Canals	7	7	FastEST assay required
Rivers	7	7	FastEST assay required
Lakes and Reservoirs ^{††}	7	7	FastEST assay required

[†] For purposes of Sonar PR labeling, a pond is defined as a body of water 10 acres or less in size. A lake or reservoir is greater than 10 acres.

^{††} In lakes and reservoirs where one-half or greater of the body of water is treated, use the pond and static canal irrigation precautions.

Where the use of Sonar PR treated water is desired for irrigating crops prior to the time frames established above, the use of a FastEST assay is recommended to measure the concentration in the treated water. Where a FastEST has determined that concentrations are less than 10 parts per billion, there are no irrigation precautions for irrigating established tree crops, established row crops or turf. **For tobacco, tomatoes, peppers or other plants within the Solanaceae Family and newly seeded crops or newly seeded grasses such as overseeded golf course greens, do not use Sonar PR treated water if concentrations are greater than 5 ppb; furthermore, when rotating crops, do not plant members of the Solanaceae family in land that has been previously irrigated with fluridone concentrations in excess of 5 ppb. It is recommended that an aquatic specialist be consulted prior to commencing irrigation of these sites.**

PLANT CONTROL INFORMATION

Sonar PR selectivity is dependent upon dosage, time of year, stage of growth, method of application, and water movement. The following categories, controlled, partially controlled, and not controlled are provided to describe expected efficacy under ideal treatment conditions using higher to maximum label rates. Use of lower rates will increase selectivity of some species listed as controlled or partially controlled. Additional aquatic plants may be controlled, partially controlled, or tolerant to Sonar PR. Consult an aquatic specialist prior to application of Sonar PR to determine a plant's susceptibility to Sonar PR.

VASCULAR AQUATIC PLANTS CONTROLLED BY SONAR PR¹

Submersed Plants:Bladderwort (*Utricularia* spp.)Common coontail (*Ceratophyllum demersum*)[†]Common Elodea (*Elodea canadensis*)[†]Egeria, Brazilian Elodea (*Egeria densa*)

**VASCULAR AQUATIC PLANTS NOT CONTROLLED BY
SONAR PR PRECISION RELEASE:**

Emerald Plants:

American frogbit (*Limnobium spongia*)
Arrowhead (*Sagittaria* spp.)
Bacopa (*Bacopa* spp.)
Big floatingheart, banana lily (*Nymphoides aquatica*)
Bulrush (*Scirpus* spp.)
Pickerelweed, lanceleaf (*Pontederia* spp.)
Rush (*Juncus* spp.)
Water pennywort (*Hydrocotyle* spp.)

Floating Plants:

floating waterhyacinth (*Eichhornia crassipes*)
waterlettuce (*Pistia stratiotes*)

Shoreline Grasses:

Maidencane (*Panicum hemitomom*)

NOTE: Algae (chara, nitella, and filamentous species) are not controlled by Sonar PR.

APPLICATION DIRECTIONS

The aquatic plants present in the treatment site should be identified prior to application to determine their susceptibility to Sonar PR. It is important to determine the area (acres) to be treated and the average depth in order to select the proper application rate. Do not exceed the maximum labeled rate for a given treatment site per annual growth cycle.

Application to Ponds

Sonar PR may be applied to the entire surface area of a pond. For single applications, rates may be selected to provide 45 to 90 ppb to the treated water, although actual concentrations in treated water may be substantially lower at any point in time due to the slow-release formulation of this product. When treating for optimum selective control, lower rates may be applied for sensitive target species. Use the higher rate within the rate range where there is a dense weed mass, when treating more difficult to control species, and for ponds less than 5 acres in size with an average depth less than 4 feet. Application rates necessary to obtain these concentrations in treated water are shown in the following table. For additional application rate calculations, refer to the *Application Rate Calculation—Ponds, Lakes and Reservoirs* section of this label. Split or multiple applications may be used where dilution of treated water is anticipated; however, the sum of all applications should total 45 to 90 ppb and must not exceed a total of 90 ppb per annual growth cycle.

Average Water Depth of Treatment Site (feet)	Pounds of Sonar PR per treated surface acre	
	45 ppb	90 ppb
1	2.5	5.0
2	5.0	10.0
3	7.5	15.0
4	10.0	20.0
5	12.5	25.0
6	15.0	30.0
7	17.0	34.0
8	19.5	39.0
9	22.0	44.0
10	24.5	49.0

Application to Lakes and Reservoirs

The following treatments may be used for treating both whole lakes or reservoirs and partial areas of lakes or reservoirs (bays, etc.). For best results in treating partial lakes and reservoirs, Sonar PR treatment areas should be a minimum of 5 acres in size. Treatment of areas smaller than 5 acres or treatment of narrow strips such as boat lanes or shorelines may not produce satisfactory results due to dilution by untreated water. Rate ranges are provided as a guide to include a wide range of environmental factors, such as target species, plant susceptibility, selectivity and other aquatic plant management objectives. Application rates and methods should be selected to meet the specific lake/reservoir aquatic plant management goals.

**A. Whole Lake or Reservoir Treatments
(Limited or No Water Discharge)**

1. Single Application to Whole Lakes or Reservoirs

Where single applications to whole lakes or reservoirs are desired, apply Sonar PR at an application rate of 16 to 90 ppb. Application rates necessary to obtain these concentrations in treated water are shown in the following table. For additional application rate calculations, refer to the *Application Rate Calculation—Ponds, Lakes and Reservoirs* section of this label. Choose an application rate from the table below to meet the aquatic plant management objective. **Where greater plant selectivity is desired such as when controlling Eurasian watermilfoil and curlyleaf pondweed, choose an application rate lower in the rate range.** For other plant species, SePRO recommends contacting an aquatic specialist in determining when to choose application rates lower in the rate range to meet specific plant management goals. Use the higher rate within the rate range where there is a dense weed mass or when treating more difficult to control plant species or in the event of a heavy rainfall event where dilution has occurred. In these cases, a second application or more may be required; however, the sum of applications cannot exceed 150 ppb per annual growth cycle. Refer to the section of this label entitled, *Split or Multiple Applications to Whole Lakes or Reservoirs*, for guidelines and maximum rate allowed.

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An application at the higher end of the specified rate range may be required and frequency of applications will vary depending upon the potential of untreated water diluting the Sonar PR concentration in the treatment area. Use a rate at the higher end of the rate range where greater dilution with untreated water is anticipated.

Average Water Depth of Treatment Site (feet)	Pounds of Sonar PR per treated surface acre	
	16 ppb	90 ppb
1	0.9	5.0
2	1.7	10.0
3	2.6	15.0
4	3.5	20.0
5	4.3	25.0
6	5.2	30.0
7	6.0	34.0
8	6.9	39.0
9	7.8	44.0
10	8.6	49.0
11	9.5	54.0
12	10.4	59.0
13	11.2	64.0
14	12.1	68.0
15	13.0	73.0
16	13.8	78.0
17	14.7	83.0
18	15.6	88.0
19	16.4	93.0
20	17.3	98.0

2. Split or Multiple Applications to Whole Lakes or Reservoirs

To meet certain plant management objectives, split or multiple applications may be desired in making whole lake treatments. Split or multiple application programs are desirable when the objective is to use the minimum effective dose and to maintain this lower dose for the sufficient time to ensure efficacy and enhance selectivity. Under these situations, use the lower rates (16 to 75 ppb) within the rate range. **In controlling Eurasian watermilfoil and curlyleaf pondweed and where greater plant selectivity is desired, choose an application rate lower in the rate range.** For other plant species, SePRO recommends contacting an aquatic specialist in determining when to choose application rates lower in the rate range to meet specific plant management goals. For split or repeated applications, the sum of all applications must not exceed 150 ppb per annual growth cycle.

NOTE: In treating lakes or reservoirs that contain potable water intakes and the application requires treating within 1/4 mile of a potable water intake, no single application can exceed 20 ppb. Additionally, the sum of all applications cannot exceed 150 ppb per annual growth cycle.

B. Partial Lake or Reservoir Treatments

Where dilution of Sonar PR with untreated water is anticipated, such as in partial lake or reservoir treatments, split or multiple applications may be used to extend the contact time to the target plants. The application rate and use frequency of Sonar PR in a partial lake is highly dependent upon the treatment area.

1. Application Sites Greater Than 1/4 Mile from a Functioning Potable Water Intake

For single applications, apply Sonar PR at application rates from 45 to 150 ppb. Split or multiple applications may be made; however, the sum of all applications cannot exceed 150 ppb per annual growth cycle. Split applications should be conducted to maintain a sufficient concentration in the target area for a period of 45 days or longer. The use of a FastEST is recommended to maintain the desired concentration in the target area over time.

2. Application Sites Within 1/4 Mile of a Functioning Potable Water Intake

In treatment areas that are within 1/4 mile of a potable water intake, no single application can exceed 20 ppb. When utilizing split or repeated applications of Sonar PR for sites which contain a potable water intake, a FastEST is required to determine the actual concentration in the water. Additionally, the sum of all applications cannot exceed 150 ppb per annual growth cycle.

APPLICATION RATE CALCULATION – PONDS, LAKES AND RESERVOIRS

The amount of Sonar PR to be applied to provide the desired ppb concentration of active ingredient equivalents in treated water may be calculated as follows:

- **Pounds of Sonar PR required per treated acre** = Average water depth of treatment site x Desired ppb concentration of active ingredient equivalents x 0.054

For example, the pounds per acre of Sonar PR required to provide a concentration of 25 ppb of active ingredient equivalents in water with an average depth of 5 feet is calculated as follows:

$$5 \times 25 \times 0.054 = 6.75 \text{ pounds per treated surface acre.}$$

NOTE: Calculated rates may not exceed the maximum allowable rate in pounds per treated surface acre for the water depth listed in the application rate table for the site to be treated.

APPLICATION TO DRAINAGE CANALS, IRRIGATION CANALS AND RIVERS

Static Canals: In static drainage and irrigation canals, apply Sonar PR at the rate of 20 to 40 pounds per surface acre.

Moving Water Canals and Rivers: The performance of Sonar PR will be enhanced by restricting or reducing water flow. In slow moving bodies of water use an application technique that maintains a concentration of 10 to 40 ppb in the applied area for a minimum of 45 days. Sonar PR can be applied by split or multiple broadcast applications or by metering in the product to provide a uniform concentration of the herbicide based upon the flow pattern. The use of a FasTEST is recommended to maintain the desired concentration in the target area over time.

Static or Moving Water Canals or Rivers Containing a Functioning Potable Water Intake: In treating a static or moving water canal or river which contains a functioning potable water intake, applications of Sonar PR greater than 20 ppb must be made more than 1/4 mile from a functioning potable water intake. Applications less than 20 ppb may be applied within 1/4 mile from a functioning potable water intake; however, if applications of Sonar PR are made within 1/4 mile from a functioning water intake, a FasTEST must be utilized to demonstrate that concentrations do not exceed 150 ppb at the potable water intake.

APPLICATION RATE CALCULATION – DRAINAGE CANALS, IRRIGATION CANALS AND RIVERS

The amount of Sonar PR to be applied through a metering system to provide the desired ppb concentration of active ingredient in treated water may be calculated as follows:

1. Average flow rate (feet per second) \times average width (ft.)
 \times average depth (ft.) \times 0.9 = CFS (cubic feet per second)
2. CFS \times 1.98 = acre feet per day (water movement)
3. Acre feet per day \times desired ppb \times 0.054 = pounds Sonar PR Precision Release required per day

Storage and Disposal

Do not contaminate water, food or feed by storage or disposal.

Pesticide Storage: Store in original container only. Do not store near feed or foodstuffs. In case of spill, contain material and dispose as waste.

Pesticide Disposal: Wastes resulting from use of this product may be used according to label directions or disposed of at an approved waste disposal facility.

Nonrefillable Container Disposal (rigid, \leq 50 pounds):

Do not reuse or refill this container. Triple rinse (or equivalent). Then offer for recycling (if available) or reconditioning, or puncture and dispose of in a sanitary landfill, or by incineration, or if allowed by State and Local authorities, by burning. If burned, stay out of smoke.

Refillable Container Disposal: Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. Seal all openings which have been opened during use. Return the empty container to a collection site designated by SePRO Corporation. If the container has been damaged and cannot be returned according to the recommended procedures, contact SePRO Corporation at 1-800-419-7779 to obtain proper handling instructions.

Warranty Disclaimer

SePRO Corporation warrants that the product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. To the extent consistent with applicable law, SEPRO CORPORATION MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

Inherent Risks of Use

It is impossible to eliminate all risks associated with use of this product. Plant injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label such as unfavorable temperatures, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner or application, or other factors, all of which are beyond the control of SePRO Corporation as the seller. To the extent consistent with applicable law, all such risks shall be assumed by buyer.

Limitation of Remedies

To the extent consistent with applicable law, the exclusive remedy for losses or damages resulting from this product (including claims based on contract, negligence, strict liability, or other legal theories) shall be limited to, at SePRO Corporation's election, one of the following:

- (1) Refund of purchase price paid by buyer or user for product bought, or
- (2) Replacement of amount of product used.

To the extent consistent with applicable law, SePRO Corporation shall not be liable for losses or damages resulting from handling or use of this product unless SePRO Corporation is promptly notified of such losses or damages in writing. In no case shall SePRO Corporation be liable for consequential or incidental damages or losses.

The terms of the *Warranty Disclaimer* above and this *Limitation of Remedies* can not be varied by any written or verbal statements or agreements. No employee or sales agent of SePRO Corporation or the seller is authorized to vary or exceed the terms of the *Warranty Disclaimer* or *Limitations of Remedies* in any manner.

Fluridone

What is Fluridone and how does it work?

Fluridone is a wide spectrum (meaning it kills many plants), slow acting systemic herbicide that is available in liquid and pellet formulations. It is highly effective in controlling nearly all emerged and submersed plants including Eurasian water milfoil and Brazilian Elodea. Fluridone works by interrupting carotene synthesis. Carotene helps plants photosynthesize by protecting chlorophyll pigments from being rapidly degraded by the sun. Exposed plants cannot maintain the chlorophyll they need for photosynthesis, so they eventually die. Fluridone when applied at low concentrations (<5ppb) and held for a period of 6 to 8 weeks, can be somewhat selective for milfoil.

What plants are controlled by Fluridone?

Submersed Plants:

bladderwort (*Utricularia* spp.)
common coontail (*Ceratophyllum demersum*)[†]
common Elodea (*Elodea canadensis*)[†]
egeria, Brazilian Elodea (*Egeria densa*)
fanwort, Cabomba (*Cabomba caroliniana*)
hydrilla (*Hydrilla verticillata*)
naiad (*Najas* spp.)[†]
pondweed (*Potamogeton* spp., except Illinois pondweed)[†]
watermilfoil (*Myriophyllum* spp. except variable-leaf milfoil)

Plants somewhat controlled by Fluridone:

Emerald Plants:

Alligatorweed (*Alternanthera philoxeroides*)
American lotus (*Nelumbo lutea*)
Cattail (*Typha* spp.)
Creeping waterprimrose (*Ludwigia peploides*)
Parrotfeather (*Myriophyllum aquaticum*)
Smartweed (*Polygonum* spp.)
Spatterdock (*Nuphar luteum*)
Spikerush (*Eleocharis* spp.)
Waterlily (*Nymphaea* spp.)
Waterpurslane (*Ludwigia palustris*)
Watershield (*Brasenia schreberi*)

Submersed Plants:

Illinois pondweed (*Potamogeton illinoensis*)
Limnophila (*Limnophila sessiliflora*)
Tapegrass, American eelgrass (*Vallisneria spiralis*)
Watermilfoil-variable-leaf (*Myriophyllum heterophyllum*)

Is Fluridone safe to use?

Fluridone is considered to have very low toxicity for humans and the environment. Fluridone is safe for mammals and birds, except at concentrations that far exceed legal application rates or even those that would result from accidental contact. 15 parts per million, the maximum concentration allowed in lakes is 75 times greater than the amount found to be lethal to trout. Fluridone is typically maintained at concentrations less than 15 parts per billion for milfoil control which greatly increases the already large safety margin between the effective and toxic concentration. EPA studies have shown no carcinogenic effects due to chronic exposure to Fluridone. Fluridone does not bio-accumulate and it does not persist in the environment because it binds to organic matter and is quickly degraded by sunlight.

What use or timing restrictions are there for Fluridone?

Fluridone has no restrictions for swimming, or fishing and has no application timing restrictions. Fluridone concentrations must be below 10 ppb to be safely used for irrigation. As with any aquatic herbicide, proper permits need to be obtained, and Fluridone can only be applied by a Washington state licensed applicator.

How much Does Fluridone Cost?

The cost of Fluridone application is highly variable and depends on water depth, desired concentration, the formula used, and how many applications are needed to maintain effective concentrations. Recent price quotes for the solid formula is approximately \$200 per acre. The applied cost of the liquid formulation is dependent in lake depth, volume and mixing and cannot be summarized as a unit cost.

Are there any downsides to using Fluridone to control submerged plants?

Fluridone requires long contact times (up to 90 days) to achieve maximum effectiveness. Where there is significant water exchange it can be difficult to maintain effective concentrations of the herbicide. Even in closed lakes repeat applications are needed to maintain effective concentrations. Several controlled release formulas (i.e., granular rather than liquid forms) of Fluridone have been developed over the past few years and have yielded good results in high water exchange environments.

Some additional reading on Fluridone:

Cornell Extension Toxicology Network Factsheet

<http://pmep.cce.cornell.edu/profiles/herb-growthreg/fatty-alcohol-monuron/fluridone/herb-prof-fluridone.html>

Fluridone (Sonar[®])

March 2000

Fact Sheet

Environmental Health Programs
Office of Environmental Health & Safety



Fluridone is an aquatic herbicide used to control common nuisance plants like pondweed and watermilfoil. It is not equally effective at killing all water plants and has been used in Washington to selectively remove certain nuisance weeds. It is absorbed by the leaves, shoots and roots of vascular plants and kills susceptible plants by inhibiting their ability to form carotene, a substance which plants need to maintain essential levels of chlorophyll. Damage in susceptible plants usually appears in 7-10 days after water treatment.

Fluridone is the active ingredient in Sonar[®] and comes in two formulations: pellets (Sonar SRP) and liquid concentrate (Sonar A.S.)

The initial rate of application recommended by Sonar labels is quite dilute and varies depending on the size of pond or lake, density of weeds, and susceptibility of targeted weeds. Control of watermilfoil in Washington is often accomplished with rates as low as 10-20 parts per billion (ppb).

Environmental Persistence

Fluridone is moderately persistent in water and sediments following treatment of a pond

or lake. Field tests have shown that the average half-life in pond water is 21 days and longer in sediments (90 days in hydrosol). Residues may persist longer depending on the amount of sunlight and the water temperature. Fluridone is primarily degraded by sunlight and microorganisms.

Health Impacts

Laboratory animals (mice, rats, dogs) fed fluridone in their diets showed little signs of toxicity even when fed levels which far exceed potential human exposure from use of Sonar. Fluridone is not considered to be a carcinogen or mutagen and is not associated with reproductive or developmental effects in test animals.

There is no EPA standard for maximum allowable concentration (MCL) of fluridone in public water supplies. For the purpose of Sonar product registration, EPA determined that 150 ppb is an acceptable level for potable water following Sonar use. This level provides a 1000-fold safety factor between the no effect level in experimental animals and the estimated human exposure via drinking water.

Common Questions

Can I use treated lake water for drinking?

The Sonar label prohibits application to water within 1/4 mile of functioning potable water intakes unless the treatment rate is 20 ppb or less. Estimated human exposure from daily consumption of water with 20 ppb of fluridone is 10,000-fold less than the no effect level in test animals. People who wish to avoid even minimal residues can do so by filtering their drinking water with a charcoal-based filter.

Can I swim and fish in treated water?

There are no swimming or fishing restrictions associated with fluridone treatment. Fluridone does not significantly bioaccumulate or biomagnify in fish. Consumption of fish from treated water does not pose a threat to human health.

Can fluridone leach into groundwater wells, which are shallow and close to a treated water body? Fluridone tends to bind to organic matter and should not leach into groundwater from aquatic sediments. Fluridone shows a limited ability to leach if applied to soil.

What about the other ingredients in Sonar?

"Inert" ingredients included in formulations of fluridone are confidential. DOH was permitted to review the list of inerts in Sonar and concluded that these chemicals are not of human concern at applied concentrations.

Can I use treated water for watering domestic plants?

For information about susceptibility of specific plants, consult the product label or contact the manufacturer. According to the manufacturer, Sonar used at the maximum-labeled rate (150 ppb) may affect domestic plants, especially plants in the *Solanaceae* family (tomato, potato, eggplant, peppers etc.). More dilute concentrations are unlikely to affect domestic plants. Again, a charcoal-based filter will remove fluridone residues from water.

Need More Information?

Please Contact:

- Your county health agency
- Washington State Department of Health
Pesticide Program (360)236-3360
- Washington State Department of Ecology
Water Quality Program (360)407-6563
- Sepro is the company which manufactures Sonar products. Material Safety Data Sheets and current copies of Sonar labels are available by calling 1-800-419-7779 or at the Sepro website
www.sepro.com/aquatics/sonar/index.html
- Additional copies of this fact sheet can be obtained from:
Office of Environmental Health & Safety
P.O. Box 47825
Olympia, Washington 98504-7825
Tollfree: (888) 586-9427

S6. NOTIFICATION AND POSTING REQUIREMENTS

A. Ecology Notification Requirements

1. Pre- and post-treatment notification – For every week that treatment is planned, the Permittee(s) shall email information to Ecology on the form supplied in Appendix D. This form shall list the water bodies scheduled for treatment the following week. This form shall also detail the treatments that have taken place during the current week. The Permittee shall send the email to the appropriate Ecology regional office and Ecology headquarters no later than 5:00 pm on Friday of each week during the treatment season.

Central Regional Office, Yakima	(509) 575-2490	email: rlat461@ecy.wa.gov
Eastern Regional Office, Spokane	(509) 329-3400	email: kner461@ecy.wa.gov
Northwest Regional Office, Bellevue	(425) 649-7000	email: tsho461@ecy.wa.gov
Southwest Regional Office, Lacey	(360) 407-6300	email: mhil461@ecy.wa.gov
Water Quality Headquarters, Lacey	(360) 407-6400	email: kelm461@ecy.wa.gov

2. Inspection Coordination Requirements

- a. At Ecology's request, each Permittee shall coordinate and schedule inspections with the appropriate Ecology regional staff.
 - b. The agreed upon location and starting time for the inspection shall be on record in writing at Ecology.
 - c. For inspections scheduled by the Ecology regional staff in Condition S6.A.2.a., the Permittee shall not treat unless Ecology staff are present or do not appear within 30 minutes of the scheduled and agreed upon start time, at the scheduled and agreed upon location.
3. The Permittee shall immediately notify the appropriate Ecology regional office if a spill of product(s) covered under this permit occurs into waters of the state, or onto land with a potential for entry into waters of the state. The Permittee shall notify the appropriate Ecology regional office when they are made aware of any of the following conditions occurring during or after a treatment:
 - a. Any person(s) exhibits or indicates any toxic and/or allergic response as a result of the treatment.
 - b. Any fish or fauna exhibit stress conditions or die within or downstream of the treatment area.

3. If the Residential and Business Notice explains the chemical **application schedule** for the whole season, and there is no deviation from that plan, no further Residential and Business Notice will be required for the rest of the season (unless a resident or business specifically requests further notification).

C. Camp Notification Requirements

1. Camps shall notify parents/guardians of campers in writing if a pesticide application is expected to occur during or within two weeks prior to their camper attending camp.
2. The written notification shall include:
 - a. The name of the product being applied,
 - b. The time period during which the treatment will occur,
 - c. Any swimming or recreational advisories or restrictions as named in this permit or on the product label, and
 - d. Camp contact information for further questions.

D. Posting Requirements

1. The Permittee shall post signs no more than 48 hours prior to the application of any products covered under this permit. (The Permittee shall use templates provided in Appendix F). No modifications of this template are allowed, except where Ecology has requested that the Permittee fill in label restrictions about the pesticide to be used.
2. The Permittee shall ensure that posted signs remain in place until the end of the period of water use restrictions.
3. The Permittee shall remove all old signs before a new treatment begins or before the end of the treatment season, whichever comes first.
4. The Permittee shall post warning signs in English and in the language commonly spoken by the community that uses the area.
5. Posting Privately or Publicly-Owned Shoreline Areas (excluding public access areas)
 - a. The Permittee shall post **privately or publicly-owned shorelines** using the templates provided in Appendix F. No modifications of this template are allowed, except where Ecology has requested that the Permittee fill in label restrictions about the pesticide to be used.

- b. For those applications containing a publicly accessible area,
 - i. Post signs no more than 48 hours prior to an application
 - ii. Place signs within 25 feet of any shoreline facing both egress and entrance of any boat launch on the water body that is within ½ mile of any treatment site. Boat launches also include sites commonly used as put-ins and take-outs for small, non-trailer watercraft. Check the Washington State Parks and Recreation Commission publication Public Boating Facilities in Washington State, second edition, 1988, to identify public accesses. Reference copies of this publication are available through the Washington State Library, King County Library, Gonzaga University Library, and Washington State University Library.
 - c. The Permittee(s) shall use good faith and reasonable effort to ensure that posted signs are secured and remain in place.
 - d. The Permittee shall post signs so they are secure from the normal effects of weather and water currents, but cause no damage to private or public property.
 - e. The Permittee is responsible for removal of all signs at the end of the treatment season. Biodegradable sign material may be used so that removal is not necessary.
 - f. The Permittee shall post signs in English and the language, if other than English, commonly spoken by the community that uses the area.
8. Posting on the Water
- a. The Permittee shall post buoys on the water when any of the following conditions are met for the treatment of submersed, floating, or floating-leaved plants:
 - i. The product has recreational and/or fish consumption restrictions,
 - ii. The water body is greater than one acre and/or more than 200 feet from the treatment area to the opposite shore, or
 - iii. The entire shoreline has not been posted.
 - b. Posted buoys shall have:
 - i. Durable weather-resistant signs
 - ii. Signs readable from two opposing directions
 - iii. Signs positioned so they are completely out of the water

Sonar*

**An Effective Herbicide That Poses
Negligible Risk To Human Health
And The Environment**

SONAR*

An Effective Herbicide That Poses Negligible Risk To Human Health And The Environment

Sonar is a highly effective aquatic herbicide used to selectively manage undesirable aquatic vegetation in freshwater ponds, lakes, reservoirs, rivers and canals. Sonar is absorbed through the leaves, shoots, and roots of susceptible plants, and destroys the plant by interfering with its ability to make and use food. As with any substance introduced into the environment, concerns arise about possible harmful effects on humans who may come into contact with it, and about its effects on wildlife and plants that we wish to protect and preserve. The following discussion, presented in a "Question and Answer" format, provides information regarding Sonar and evidence that Sonar presents negligible risk¹ to human health and the environment when applied according to its legally allowed uses and label directions.

Q1. What are the legally approved uses of Sonar?

A1. Sonar has been approved for use by the U.S. Environmental Protection Agency (USEPA) since 1986 for the management of aquatic vegetation in freshwater ponds, lakes, reservoirs, drainage canals, irrigation canals and rivers. Four different formulations have been approved for use—an aqueous suspension known as Sonar A.S. (USEPA Registration Number 67690-4) and three pellet forms known as Sonar SRP (USEPA Registration Number 67690-3), Sonar PR Precision Release (USEPA Registration Number 67690-12), and Sonar Q Quick Release (USEPA Registration Number 67690-3). There are no USEPA restrictions on the use of Sonar-treated water for swimming or fishing when used according to label directions. The Agency has approved Sonar's application in water used for drinking as long as residue levels do not exceed 0.15 parts per million (ppm) or 150 part per billion (ppb). For reference, one (1) ppm can be considered equivalent to roughly one second in 12 days or one foot in 200 miles, and (0.1) ppm can be considered approximately equal to one second in 120 days or one foot in 2,000 miles.

Sonar's USEPA-approved labeling states that in lakes and reservoirs that serve as drinking water sources, Sonar applications can be made up to within one-fourth mile (1,320 feet) of a potable water intake. For the control of Eurasian watermilfoil, curlyleaf pondweed and hydrilla where treatment concentrations are 0.01 to 0.02 ppm (10 to 20 ppb), this setback distance of one-fourth mile from a potable water intake is not required. Note that these effective treatment concentrations are well below the 0.15 ppm (150 ppb) allowable limit in water used for drinking.

Local public agencies may require permits for use of an herbicide in public waters. Therefore, the Sonar label states that the user must consult appropriate state or local water authorities before applying the herbicide.

¹Throughout this document, we use the phrases "negligible risk" or "no significant risk." We use these terms because it is beyond the capabilities of science to prove that a substance is absolutely safe, i.e., that the substance poses no risk whatsoever. Any substances, be it aspirin, table salt, caffeine, or household cleaning products, will cause adverse health effects at sufficiently high doses. Normal exposures to such substances in our daily lives, however, are well below those associated with adverse health effects. At

some exposure, risks are so small that, for all practical purposes, no risk exists. We consider such risks to be negligible or insignificant.

*Trademark of SePRO Corporation

Q2. How does a product such as Sonar gain approval for use? (How does it become registered?)

A2. Federal law requires that an aquatic herbicide be registered with the USEPA before it can be shipped or sold in the United States. To obtain registration, manufacturers are required to conduct numerous studies (i.e., over 120 studies depending upon the intended uses) and to submit a thorough and extensive data set to USEPA to demonstrate that, under its conditions of use, the product will not pose a significant risk to human health and the environment and that the herbicide is effective against the target weeds or plants.

Individual states can establish registration standards that are more strict than federal standards, but not less strict.

Q3. What types of information must be submitted to regulatory agencies before an herbicide is registered?

A3. To register a herbicide, the manufacturer must submit information that falls into the following categories: product chemistry (for example, solubility, volatility, flammability and impurities), environmental fate (for example, how the substance degrades in the environment), mammalian toxicology (studies in laboratory animals used to assess potential health risks to humans), and wildlife and aquatic (for example, bird and fish) toxicology. If there are any residues in the environment, their levels must be determined. A manufacturer also conducts studies of product performance (or efficacy as a herbicide).

Q4. Have all of the data required for registration of Sonar been submitted to regulatory agencies, and have those agencies found the data acceptable?

A4. The data required for registration of Sonar by the USEPA is complete and has been accepted by the USEPA and by all states.

Q5. What happens to Sonar when it is used according to approved labeling -- that is, what is its environmental fate or what happens to Sonar once it is released or applied to the water?

A5. Tests under field conditions show that Sonar disappears from treated water in a matter of weeks or months, depending on a number of environmental factors such as sunlight, water temperature and depth. In lakes, reservoirs, rivers and canals where only a portion of the water body is treated, dilution reduces the level of Sonar relatively quickly following application.

Sonar does not persist in the environment. Its disappearance from aquatic environments is accomplished by several processes. First, the plants that are being

treated absorb Sonar, thereby removing a portion of it from the water. Second, Sonar degrades or breaks down in the presence of sunlight by a process called "photo degradation." Photo degradation is the primary process contributing to the loss of Sonar from water. Third, adsorption of Sonar to hydrosol (sediments) also contributes to its loss from water. As Sonar is released from hydrosol back into the water, it is photo degraded.

Study results indicate that Sonar has a low bioaccumulation potential and therefore is not a threat to the food chain. Specifically, studies have shown that Sonar does not accumulate in fish tissue to any significant degree. The relatively small amounts of Sonar that may be taken up by fish following application are eliminated as the Sonar levels in water decline. In a study of crops irrigated with Sonar treated water, no residues of Sonar were found in any human food crops, and only very low levels were detected in certain forage crops. Consumption by livestock of Sonar-treated water and crops irrigated with Sonar-treated water was shown to result in negligible levels of Sonar in lean meat and milk. Sonar-treated water can be used immediately for watering livestock.

To ensure that residue levels of Sonar pose no significant risk, USEPA has established tolerances, or maximum legally allowable levels, in water, fish, and crops irrigated with Sonar-treated water, and other agricultural products (including eggs, milk, meat, and chicken). For example, the 0.15 ppm (150 ppb) concentration in water mentioned in the answer to Question #1 is the tolerance limit for water that is used for drinking. The recommended application rates of Sonar (detailed on the label) are established to ensure the product will do its job and that tolerance limits won't be exceeded.

Q6. How might people come into contact with Sonar after it is applied to an aquatic site?

A6. People could come into contact with Sonar by swimming in water bodies treated with the herbicide, by drinking water from treated lakes or reservoirs, by consuming game fish taken from treated waters, and by consuming meat, poultry, eggs or milk from livestock that were provided water from treated surface water sources.

Q7. Is it likely that people will be harmed because of those contacts?

A7. Extensive studies have demonstrated that contact with Sonar poses negligible health risks when the herbicide is used according to label instructions. The label for Sonar carries no restrictions for swimming or fishing in treated water or against drinking water treated with Sonar. Sonar does not build up in the body.

The conclusion that Sonar poses negligible health risks is evidenced by USEPA's toxicity rating for Sonar. The USEPA classifies herbicides according to their acute toxicity or potential adverse health effects and requires that a "signal word" indicating the relative toxicity of the herbicide be prominently displayed on the product label. Every herbicide carries such a signal word. The most acutely toxic herbicide category requires the signal word DANGER. However, if the product is especially toxic, the additional word POISON is displayed. Herbicides of moderate acute toxicity require the signal word WARNING. The least toxic products require the signal word CAUTION. Sonar labels display the word CAUTION, the USEPA's lowest acute toxicity rating category.

Q8. How do we know that humans are not likely to experience any harmful effects from Sonar's temporary presence in the environment?

A8. Companies that develop new herbicides are required to: 1) conduct extensive investigations of the toxicology of their product in laboratory animals; 2) characterize the ways by which people may contact the herbicide after it has been applied to an aquatic site; 3) determine the amount of exposure resulting from these possible contacts; and 4) demonstrate the fate of the herbicide in the environment. Before USEPA will register a herbicide, the Agency must establish with a high degree of certainty that an ample safety margin exists between the level to which people may be exposed and the level at which adverse effects have been observed in the toxicology studies.

Investigations of the toxicity of Sonar have been performed in laboratory animals under a variety of exposure conditions, including exposure to very high doses for short periods (acute studies), as well as repeated exposures to lower doses (which are still far in excess of any exposures that humans might actually receive) throughout the lifetime of the laboratory animals (chronic studies). Other special studies have been performed to evaluate the potential for Sonar to cause reproductive effects, cancer, and genetic damage. Study results indicate a low order of toxicity to mammalian species following acute exposures and repeat-dose exposures for up to a lifetime. In addition, repeated doses of Sonar did not result in the development of tumors, adverse effects on reproduction or on development of offspring, or genetic damage.

In characterizing the toxicity of a compound and its safety margin for exposures of humans and wildlife, toxicologists attempt to identify the maximum dose at which a chemical produces no toxicity. Another way of stating this is how much of the chemical can an organism be exposed to before it reaches a toxic level (recall from the footnote to the introduction on page 1 that all substances are toxic at some dose or level). This maximum non-toxic dose is usually established by studies in laboratory animals and is reported as the "no-observed-effect level" or NOEL. The dietary NOEL for Sonar (that is, the highest dose at which no adverse effects were observed in laboratory animals fed Sonar) is approximately 8 milligrams of Sonar per kilogram of body weight per day, abbreviated 8 mg/kg/day. This NOEL was derived from a study in rats that were fed Sonar in their regular diets every day for their entire two-year lifetime.

To put this NOEL into perspective, a 70-kg adult (about 150 pounds) would have to drink over 1,000 gallons of water containing the maximum legally allowable concentration of Sonar in potable water (0.15 ppm) daily for a significant portion of their lifetime to receive a dose equivalent to the 8 mg/kg/day NOEL. At most, adults drink about 2 quarts (one-half gallon) of water daily, which means that even if a person were drinking water with the maximum legally allowable concentration of Sonar, their margin of safety would still be at least 2,000. Similarly, a 20-kg child (about 40 pounds) would have to drink approximately 285 gallons of Sonar-treated water every day to receive a dose equivalent to the NOEL. Because children drink only about one quart of water daily, this provides a safety margin of greater than 1,000.

The above example calculation of safety margins is based on the assumption that potable water will contain levels of Sonar at its maximum allowable concentration of 0.15 ppm (150 ppb). In fact, the Sonar concentration achieved under typical applications is closer to 0.02 ppm (20 ppb), thereby providing a safety margin seven times greater. The

point is that adults and children who drink water from potable water sources that have been treated with Sonar according to label instructions are at negligible risk.

Similarly, the levels of Sonar allowed in various food products pose negligible risk to human health. For example, even if Sonar were present at the maximum allowable limit of 0.05 ppm in meat, poultry, eggs, and milk, a 70-kg adult would have to consume almost 25,000 pounds of these foods daily (and again for a significant portion of a lifetime) to receive a dose equivalent to the dietary NOEL for Sonar. A child would have to consume over 7,000 pounds of these foods daily.

Because Sonar is used only intermittently in any one area, and because it disappears from the environment, there is virtually no way that anyone will be exposed continuously for a lifetime. Because the NOEL derives from a study involving daily exposures for a lifetime, the actual safety margin for people is, in fact, much greater than is suggested by the above illustrative examples.

Q9. How complete is the toxicology information upon which this conclusion rests?

A9. All toxicity studies required by the USEPA to obtain registration approval for Sonar have been completed.

Q10. What about the people who apply Sonar—are they at risk?

A10. The Sonar label states that individuals who use Sonar should avoid breathing spray mist or contact with skin, eyes, or clothing; should wash thoroughly with soap and water after handling; and should wash exposed clothing before reuse. These precautions are the minimum recommendations for the application of any pesticide. If Sonar is used according to label instructions, exposures to the product should be minimal and use should pose negligible risks to applicators.

Sonar has been shown to be of low acute toxicity in laboratory animal studies (that is, toxicity from a high dose exposure for a short period of time). Therefore, any exposure to the product (even undiluted) that might occur during use is unlikely to lead to adverse effects as long as label instructions are followed. As discussed in Question #7, Sonar's label carries the signal word CAUTION that corresponds to the USEPA's lowest acute toxicity rating category.

Studies in laboratory animals show that the lethal dose from a single oral exposure of Sonar is greater than 10,000 mg/kg. To put this into perspective, an adult would have to drink over one million gallons of Sonar-treated water (at the 0.15 [150 ppb] ppm maximum allowable limit) to receive a dose of 10,000 mg/kg; a 20-kg child would have to drink approximately 350,000 gallons.

Because applicators are more likely to contact the undiluted material than the general population, questions about the toxicity of Sonar following direct skin contact have been raised. A laboratory study of the toxicity of an 80 percent solution of Sonar applied to rabbit skin (a standard model to predict effects in humans) suggests that Sonar is minimally toxic by this route. In this study, when Sonar was repeatedly applied to the skin of rabbits for 21 days (in the largest amounts that could be applied practically), there were no signs of toxicity and only slight skin irritation was observed. Further, the dermal

administration of the 80 percent solution of Sonar did not induce sensitization in guinea pigs.

Q11. Has there been any investigation of the possible harmful effects of Sonar on fish, wildlife, pets and livestock?

A11. The toxicity of Sonar has been investigated in laboratory studies in birds (including the bobwhite quail and mallard duck), in the honey bee (as a representative insect) and in the earthworm (as a representative soil organism), in five different species of freshwater and marine fish, and in other aquatic animals. These studies have involved exposures to high concentrations for brief periods as well as exposures lasting as long as an entire lifetime, including during reproduction.

Extensive studies have also been performed to evaluate the effects of Sonar on various aquatic and terrestrial plants (both those considered undesirable aquatic weeds and those native plants that we wish to protect). Studies in laboratory animals designed primarily to assess potential health risk in humans are also relevant to the assessment of potential health effects in mammalian wildlife, livestock, and pets.

In addition, **Sonar** has been monitored in water, plants and fish during field trials. This provides firsthand information on residue levels in the environment following application of Sonar.

Q12. What do these investigations reveal?

A12. A combination of the toxicity studies and residue monitoring data reveals that Sonar poses negligible risks to aquatic animals including fish, wildlife, pets, and livestock when used according to label directions.

As was done with laboratory mammals, toxicity studies were conducted to establish a dietary no-observed effect level (NOEL) for birds. This maximum, non-toxic chronic dose is 1,000 ppm in the diet. One thousand (1,000) ppm is 2,500 times the highest average concentration of total residue found in fish (0.40 ppm), about 2,100 times the highest concentration found in aquatic plants (0.47 ppm), and about 11,500 times the highest average concentration of Sonar found in the water at field trial sites (0.087 ppm). Because the residue levels in these "bird food" items are so far below the NOEL, it can be concluded is that there are negligible risks to birds that might be exposed to Sonar in their diet following application of Sonar.

The highest average Sonar concentration found in Sonar-treated water is below the lowest NOEL values for both short and long term exposures from freshwater and marine fish. Honeybees and earthworms are not particularly sensitive to Sonar. Sonar caused no deaths in honey bees when they were dusted directly with the herbicide, and earthworms were not affected when they were placed in soil containing more than 100 ppm Sonar.

Extensive testing of Sonar in laboratory animals used to assess potential risks to human health indicates that a large safety margin exists for mammalian species in general. Thus, Sonar poses negligible risk to pets, livestock, and mammalian wildlife that might drink from water treated with Sonar.

Q13. Can Sonar be used in environmentally sensitive areas?

A13. Sonar has been used in a wide range of aquatic environments in the United States without incident for almost 15 years. Florida canals and rivers are examples of environmentally sensitive areas that have been treated with Sonar. Some sites are habitats for the endangered Florida manatee. Although toxicity testing data for the manatee, or for other endangered species, cannot be collected directly, questions about whether Sonar treatment will pose any significant risk to the manatee can be answered with results of the mammalian toxicity studies.

The Florida manatee is an aquatic mammal that consumes up to 20% (one-fifth) of its body weight per day in aquatic plants. Treatment of canal water with Sonar according to label directions is expected to result in a maximum Sonar concentration of 0.15 ppm in the water and from 0.8 to 2.6 ppm in aquatic plants. Calculations show that it would be impossible for a manatee to ingest enough Sonar in its diet to cause any adverse effects, based on results of laboratory studies in other mammals. To reach the maximum non-toxic dose or NOEL for sensitive mammalian species, a manatee would have to drink more than 40 times its body weight per day in treated water, or eat at least 3 to 10 times its body weight per day in aquatic plants. This calculation indicates that treatment with Sonar in manatee habitats—as one example of an environmentally sensitive area—will pose negligible risk. In fact, application to Florida canals and rivers has been approved by the U.S. Fish and Wildlife Service, Florida Department of Environmental Protection, and the Florida Game and Fresh Water Fish Commission.

Sonar has also been used in other environmentally sensitive areas such as Disney World, Ducks Unlimited MARSH projects, Sea World, state and federal parks, and numerous fish and waterfowl management areas.

Q14. What is it that makes Sonar an effective aquatic herbicide while being a compound of relatively low toxicity to humans?

A14. Sonar inhibits a plant's ability to make food. Specifically, Sonar inhibits carotenoid synthesis, a process specific only to plants. Carotenoids (yellow, orange and red pigments) are an important part of the plant's photosynthetic (food making) system. These pigments protect the plant's green pigments (called chlorophyll) from photo degradation or breakdown by sunlight. When carotenoid synthesis is inhibited, the chlorophyll is gradually destroyed by sunlight. As a plant's chlorophyll decreases, so does its capacity to produce carbohydrates (its food source) through photosynthesis. Without the ability to produce carbohydrates, the plant dies.

Humans do not have carotenoid pigments. Therefore, the property of Sonar that makes it an effective herbicide at low doses does not affect the human body.

Q15. Will Sonar have an adverse effect on water quality?

A15. Extensive testing of a wide range of water bodies has shown no significant changes in water quality after Sonar treatment. In fact, Sonar has a practical advantage over certain other aquatic herbicides in this area. Specifically, the dissolved oxygen content of the water does not change significantly following Sonar treatment because the relatively slow herbicidal activity of the product permits a gradual decay of the treated vegetation. Maintaining adequate dissolved oxygen levels are critical to fish and other

aquatic animals, which require oxygen to survive. This contrasts with the changes in water quality that can arise from the application of certain other aquatic herbicides that are "fast-acting." The sudden addition of large amounts of decaying plant matter to the water body can lead to decreased oxygen levels and result in a fish kill. To avoid depressions in dissolved oxygen content, label directions for certain "fast-acting" aquatic herbicides recommend that only portions of areas of dense weeds be treated at a time. Because Sonar does not have any substantial impact on dissolved oxygen, it is possible to treat an entire water body with Sonar at one time.

Q16. Is there any reason for concern about the inert ingredients used in Sonar?

A16. Inert ingredients are those components of the product that do not exhibit herbicidal activity; that is, the components other than Sonar. Water is the primary inert ingredient in Sonar A.S., making up approximately 45% of the formulation. The second largest (approximately 10%) inert is propylene glycol; a compound used in facial creams and other health and beauty products. Other inert ingredients are added to serve as wetters, dispersants, and thickeners in the formulation. Trace amounts of an antifoaming agent and a preservative are also added. The primary inert ingredient in the pelleted formulations is clay, which makes up approximately 89% of the formulation. Small amounts of a binder or coating solution are also added to reduce the dustiness of the pellets. None of the inert ingredients in Sonar formulations are on the USEPA's list of "Inerts of Toxicological Concern" or list of "Potentially Toxic Inerts/High Priority for Testing." Thus, there is no reason for concern about the inert ingredients used in Sonar.

Q17. Is it important to follow label directions for use and disposal of Sonar?

A17. Yes. It is a violation of federal law to use products, including Sonar, in a manner inconsistent with product labeling or to improperly dispose of excess products or rinsate. Although the results of extensive toxicity testing in the laboratory and in field trials indicate a low order of toxicity to non-target plants, animals, and people, Sonar, like all chemicals, will cause adverse effects at sufficiently high exposure levels. Failure to follow label directions for use and disposal of Sonar could result in environmental levels that exceeds the tolerances for Sonar established to be protective of human health and the health of pets, livestock and other wildlife. In addition, improper use of Sonar could result in unintended damage to non-target plants.

Q18. If Sonar is used in conformance with label directions, is there any reason to be concerned that Sonar will pose risk to human health or the environment?

A18. As discussed in the answers to the previous questions, results of laboratory and field studies and extensive use experience with Sonar in a wide range of water bodies strongly support the conclusion that Sonar will pose negligible risks to human health and the environment when used in conformance with label directions.

In summary, it can be said that Sonar has a favorable toxicological profile for humans. It has an overall low relative toxicity and it is not a carcinogen, mutagen or reproductive toxicant. Sonar also has a very good environmental profile for an aquatic product because of: 1) its low toxicity to non-target organisms; 2) its non-persistent behavior when applied to water bodies (i.e., it readily breaks down to carbon, hydrogen, oxygen, nitrogen and fluorine); and 3) its low bioaccumulation potential, which means it does not build up in the body or in the food chain.

ATTENTION:

This specimen label is provided for general information only.

- This pesticide product may not yet be available or approved for sale or use in your area.
- It is your responsibility to follow all federal, state and local laws and regulations regarding the use of pesticides.
- Before using any pesticide, be sure the intended use is approved in your state or locality.
- Your state or locality may require additional precautions and instructions for use of this product that are not included here.
- Monsanto does not guarantee the completeness or accuracy of this specimen label. The information found in this label may differ from the information found on the product label. You must have the EPA approved labeling with you at the time of use and must read and follow all label directions.
- You should not base any use of a similar product on the precautions, instructions for use or other information you find here.
- Always follow the precautions and instructions for use on the label of the pesticide you are using.

21195F3-25



Complete Directions for Use in Aquatic and Other Non-Crop Sites.

EPA Reg. No. 524-343

AVOID CONTACT OF HERBICIDE WITH FOLIAGE, GREEN STEMS, EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS, DESIRABLE PLANTS AND TREES, BECAUSE SEVERE INJURY OR DESTRUCTION MAY RESULT.

2006-1

Read the entire label before using this product.

Use only according to label instructions.

Not all products recommended on this label are registered for use in California. Check the registration status of each product in California before using.

Read the "LIMIT OF WARRANTY AND LIABILITY" statement at the end of the label before buying or using. If terms are not acceptable, return at once unopened.

THIS IS AN END-USE PRODUCT. MONSANTO DOES NOT INTEND AND HAS NOT REGISTERED IT FOR REFORMULATION OR REPACKAGING. SEE INDIVIDUAL CONTAINER LABEL FOR REPACKAGING LIMITATIONS.

1.0 INGREDIENTS

ACTIVE INGREDIENT:

*Glyphosate, N-(phosphonomethyl)glycine,
in the form of its isopropylamine salt 53.8%

OTHER INGREDIENTS: 46.2%
100.0%

*Contains 648 grams per liter or 5.4 pounds per U.S. gallon of the active ingredient glyphosate, in the form of its isopropylamine salt. Equivalent to 480 grams per liter or 4.0 pounds per U.S. gallon of the acid, glyphosate.

No license granted under any non-U.S. patent(s).

2.0 IMPORTANT PHONE NUMBERS

1. FOR **PRODUCT INFORMATION** OR ASSISTANCE IN USING THIS PRODUCT, CALL TOLL-FREE,

1-800-332-3111.

2. IN CASE OF AN **EMERGENCY** INVOLVING THIS PRODUCT, OR FOR **MEDICAL ASSISTANCE**, CALL COLLECT, DAY OR NIGHT,

(314)-694-4000.

3.0 PRECAUTIONARY STATEMENTS

3.1 Hazards to Humans and Domestic Animals

Keep out of reach of children.

CAUTION!

Remove contaminated clothing and wash clothing before reuse. Wash thoroughly with soap and water after handling.

3.2 Environmental Hazards

Do not contaminate water when cleaning equipment or disposing of equipment washwaters. Treatment of aquatic weeds can result in oxygen depletion or loss due to decomposition of dead plants. This oxygen loss can cause fish suffocation.

In case of: SPILL or LEAK, soak up and remove to a landfill.

3.3 Physical or Chemical Hazards

Spray solutions of this product should be mixed, stored and applied using only stainless steel, aluminum, fiberglass, plastic or plastic-lined steel containers.

DO NOT MIX, STORE OR APPLY THIS PRODUCT OR SPRAY SOLUTIONS OF THIS PRODUCT IN GALVANIZED STEEL OR UNLINED STEEL (EXCEPT STAINLESS STEEL) CONTAINERS OR SPRAY TANKS. This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas which may form a highly combustible gas mixture. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in any manner inconsistent with its labeling. This product can only be used in accordance with the Directions for Use on this label or in separately published Monsanto Supplemental Labeling. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulations.

4.0 STORAGE AND DISPOSAL

Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Keep container closed to prevent spills and contamination.

PESTICIDE STORAGE: STORE ABOVE 5°F (-15°C) TO KEEP PRODUCT FROM CRYSTALLIZING. Crystals will settle to the bottom. If allowed to crystallize, place in a warm area 68°F (20°C) for several days to redissolve and roll or shake container or recirculate in mini-bulk containers to mix well before using.

PESTICIDE DISPOSAL: Wastes resulting from the use of this product that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticide disposal or in accordance with applicable Federal, state, or local procedures.

CONTAINER DISPOSAL: Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned, or destroyed.

FOR PLASTIC ONE-WAY CONTAINERS & BOTTLES: Do not reuse container. Triple rinse container, then puncture and dispose of in a sanitary landfill or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

FOR ONE-WAY DRUMS: Do not reuse container. Return container per the Monsanto container return program. If not returned, triple rinse container,

then puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

FOR REFILLABLE PORTABLE (MINI-BULK) CONTAINERS: This container must only be refilled with pesticide product. **Do not reuse this container for any other purpose.**

Final disposal must be in compliance with state and local regulations. If not refilled, returned, or recycled, triple rinse or pressure rinse, puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

Do not transport this container if it is damaged or leaking. If the container is damaged, leaking or obsolete, or to obtain information about recycling portable refillable containers, contact Monsanto Company at 800-768-6387.

Users: When the container is empty, replace the cap and seal all openings that have been made during usage, and return the container to the point of purchase, or to an alternate location designated by the manufacturer at the time of purchase of this product. If not returned, triple rinse or pressure rinse the empty container and offer it for recycling if available.

Refillers: Do not reuse this mini-bulk container except for refill in accordance with a valid Monsanto Repackaging or Toll Repackaging Agreement. Prior to refilling, inspect carefully for damage such as cracks, punctures, abrasions, worn-out threads and closure devices. Check for leaks after refilling and before transporting.

FOR REFILLABLE STATIONARY BULK CONTAINERS: This container must only be refilled with pesticide product. **Do not reuse this container for any other purpose.**

Prior to refilling, inspect carefully for damage such as cracks, punctures, abrasions, worn-out threads and closure devices.

Final disposal must be in compliance with state and local regulations. If not refilled, triple rinse or pressure rinse container and offer for recycling or reconditioning if possible. If burned, stay out of smoke.

5.0 GENERAL INFORMATION (How This Product Works)

Product Description: This product is a postemergent, systemic herbicide with no soil residual activity. It gives broad-spectrum control of many annual weeds, perennial weeds, woody brush and trees.

Time to Symptoms: This product moves through the plant from the point of foliage contact to and into the root system. Visible effects on most annual weeds occur within 2 to 4 days, but on most perennial weeds may not occur for 7 days or more. Extremely cool or cloudy weather following treatment may slow activity of this product and delay development of visual symptoms. Visible effects are a gradual wilting and yellowing of the plant which advances to complete browning of above-ground growth and deterioration of underground plant parts.

Mode of Action in Plants: The active ingredient in this product inhibits an enzyme found only in plants and microorganisms that is essential to formation of specific amino acids.

Cultural Considerations: Reduced control may result when applications are made to annual or perennial weeds that have been mowed, grazed or cut, and have not been allowed to regrow to the recommended stage for treatment.

Rainfastness: Heavy rainfall soon after application may wash this product off of the foliage and a repeat application may be required for adequate control.

No Soil Activity: Weeds must be emerged at the time of application to be controlled by this product. Weeds germinating from seed after application will not be controlled. Unemerged plants arising from unattached underground rhizomes or rootstocks of perennials will not be affected by the herbicide and will continue to grow.

Tank Mixing: This product does not provide residual weed control. For subsequent residual weed control, follow a label-approved herbicide program. Read and carefully observe the cautionary statements and all other information appearing on the labels of all herbicides used. Use according to the most restrictive label directions for each product in the mixture.

When this label recommends a tank mixture with a generic active ingredient such as diuron, 2,4-D or dicamba, the user is responsible for ensuring that the mixture product's label allows the specific application.

Buyer and all users are responsible for all loss or damage in connection with the use or handling of mixtures of this product with herbicides or other materials that are not expressly recommended in this label. Mixing this product with herbicides or other materials not recommended on this label may result in reduced performance.

Annual Maximum Use Rate: The combined total of all treatments must not exceed 8 quarts of this product per acre per year in terrestrial sites. Any single broadcast application made over water must not exceed 7.5 pints per acre. The maximum use rates stated throughout this product's labeling apply to this product combined with the use of all other herbicides containing glyphosate or sulfosate as the active ingredient, whether

applied as mixtures or separately. Calculate the application rates and ensure that the total use of this and other glyphosate or sulfosate containing products does not exceed stated maximum use rates.

ATTENTION

AVOID CONTACT OF HERBICIDE WITH FOLIAGE, GREEN STEMS, EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS, DESIRABLE PLANTS AND TREES, BECAUSE SEVERE INJURY OR DESTRUCTION MAY RESULT.

AVOID DRIFT. EXTREME CARE MUST BE USED WHEN APPLYING THIS PRODUCT TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS.

Do not allow the herbicide solution to mist, drip, drift or splash onto desirable vegetation since minute quantities of this product can cause severe damage or destruction to the crop, plants or other areas on which treatment was not intended. The likelihood of injury occurring from the use of this product increases when winds are gusty, as wind velocity increases, when wind direction is constantly changing or when there are other meteorological conditions that favor spray drift. When spraying, avoid combinations of pressure and nozzle type that will result in splatter or fine particles (mist) that are likely to drift. AVOID APPLYING AT EXCESSIVE SPEED OR PRESSURE.

NOTE: Use of this product in any manner not consistent with this label may result in injury to persons, animals or crops, or other unintended consequences.

6.0 MIXING

Clean sprayer parts immediately after using this product by thoroughly flushing with water.

NOTE: REDUCED RESULTS MAY OCCUR IF WATER CONTAINING SOIL IS USED, SUCH AS VISIBLY MUDDY WATER OR WATER FROM PONDS AND DITCHES THAT IS NOT CLEAR.

6.1 Mixing with Water

This product mixes readily with water. Mix spray solutions of this product as follows: Fill the mixing or spray tank with the required amount of water. Add the recommended amount of this product near the end of the filling process and mix well. Use caution to avoid siphoning back into the carrier source. Use approved anti-back-siphoning devices where required by state or local regulations. During mixing and application, foaming of the spray solution may occur. To prevent or minimize foam, avoid the use of mechanical agitators, terminate by-pass and return lines at the bottom of the tank and, if needed, use an approved anti-foam or defoaming agent.

6.2 Surfactant

This product requires the use of a nonionic surfactant. When using this product, mix 2 or more quarts of a nonionic surfactant per 100 gallons of spray solution. Increasing the rate of surfactant may enhance performance. Examples of when to use the higher surfactant rate include, but are not limited to: hard-to-control woody brush, trees and vines, high water volumes, adverse environmental conditions, tough-to-control weeds, weeds under stress, surfactants with less than 70 percent active ingredient, tank mixes, etc. These surfactants should not be used in excess of 1 quart per acre when making broadcast applications.

Always read and follow the manufacturer's surfactant label recommendations for best results. Carefully observe all cautionary statements and other information appearing in the surfactant label.

When applied as recommended under the conditions described, this product controls annual and perennial weeds listed in the label booklet. Do not reduce rates of this product when adding surfactant.

6.3 Tank Mixing Procedure

Mix labeled tank mixtures of this product with water as follows:

1. Place a 20- to 35-mesh screen or wetting basket over filling port.
2. Through the screen, fill the spray tank one-half full with water and start agitation.
3. If a wettable powder is used, make a slurry with the water carrier, and add it SLOWLY through the screen into the tank. Continue agitation.
4. If a flowable formulation is used, premix one part flowable with one part water. Add diluted mixture SLOWLY through the screen into the tank. Continue agitation.
5. If an emulsifiable concentrate formulation is used, premix one part emulsifiable concentrate with two parts water. Add diluted mixture slowly through the screen into the tank. Continue agitation.
6. Continue filling the spray tank with water and add the required amount of this product near the end of the filling process.

7. Add nonionic surfactant to the spray tank before completing the filling process.
8. Add individual formulations to the spray tank as follows: wettable powder, flowable, emulsifiable concentrate, drift control additive, water soluble liquid and nonionic surfactant.

Maintain good agitation at all times until the contents of the tank are sprayed. If the spray mixture is allowed to settle, thorough agitation is required to resuspend the mixture before spraying is resumed.

Keep by-pass line on or near the bottom of the tank to minimize foaming. Screen size in nozzle or line strainers should be no finer than 50-mesh.

Always predetermine the compatibility of labeled tank mixtures of this product with water carrier by mixing small proportional quantities in advance. Ensure that the specific tank mixture product is registered for application at the desired site.

Refer to the "Tank Mixing" section of "GENERAL INFORMATION" for additional precautions.

6.4 Mixing Percent Solutions

Prepare the desired volume of spray solution by mixing the amount of this product in water as shown in the following table:

Spray Solution

DESIRED VOLUME	Amount of AquaMaster Herbicide					
	0.5%	0.75%	1%	1.5%	4%	8%
1 gal	2/3 oz	1 oz	1.3 oz	2 oz	5 oz	10 oz
25 gal	1 pt	1.5 pt	1 qt	1.5 qt	4 qt	2 gal
100 gal	2 qt	3 qt	1 gal	1.5 gal	4 gal	8 gal
2 tablespoons = 1 fluid ounce						

For use in backpack, knapsack or pump-up sprayers, it is suggested that the recommended amount of this product be mixed with water in a larger container. Fill sprayer with the mixed solution.

6.5 Colorants or Dyes

Agriculturally approved colorants or marking dyes may be added to this product. Colorants or dyes used in spray solutions of this product may reduce performance, especially at lower rates or dilution. Use colorants or dyes according to the manufacturer's recommendations.

6.6 Drift Reduction Additives

Drift reduction additives may be used with all equipment types, except wiper applicators, and sponge bars. When a drift reduction additive is used, read and carefully observe the cautionary statements and all other information appearing on the additive label. The use of drift reduction additives can affect spray coverage which may result in reduced performance.

7.0 APPLICATION EQUIPMENT AND TECHNIQUES

Do not apply this product through any type of irrigation system.

APPLY THESE SPRAY SOLUTIONS IN PROPERLY MAINTAINED AND CALIBRATED EQUIPMENT CAPABLE OF DELIVERING DESIRED VOLUMES.

SPRAY DRIFT MANAGEMENT

AVOID DRIFT. EXTREME CARE MUST BE USED WHEN APPLYING THIS PRODUCT TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS.

Do not allow the herbicide solution to mist, drip, drift or splash onto desirable vegetation since minute quantities of this product can cause severe damage or destruction to the crop, plants or other areas on which treatment was not intended.

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment- and weather-related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions.

7.1 Aerial Equipment

DO NOT APPLY THIS PRODUCT USING AERIAL SPRAY EQUIPMENT EXCEPT UNDER CONDITIONS AS SPECIFIED WITHIN THIS LABEL.

FOR AERIAL APPLICATION IN CALIFORNIA, REFER TO THE FEDERAL SUPPLEMENTAL LABEL FOR AERIAL APPLICATIONS IN THAT STATE FOR SPECIFIC INSTRUCTIONS, RESTRICTIONS AND REQUIREMENTS.

This product plus Oust, 2,4-D or dicamba tank mixtures may not be applied by air in California.

TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION, APPROPRIATE BUFFER ZONES MUST BE MAINTAINED.

Avoid direct application to any body of water.

Use the recommended rates of this herbicide in 3 to 25 gallons of water per acre.

Ensure uniform application—To avoid streaked, uneven or overlapped application, use appropriate marking devices.

AERIAL SPRAY DRIFT MANAGEMENT

The following drift management requirements must be followed to avoid off-target drift movement from aerial applications to agricultural field crops. These requirements do not apply to public health uses.

1. The distance of the outermost nozzles on the boom must not exceed 3/4 the length of the wingspan or rotor.
2. Nozzles must always point backward parallel with the air-stream and never be pointed downwards more than 45 degrees. Where states have more stringent regulations, they should be observed.

Importance of Droplet Size

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see the "Wind", "Temperature and Humidity" and "Temperature Inversions" sections of this label).

Controlling Droplet Size

- **Volume:** Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with the higher rated flows produce larger droplets.
- **Pressure:** Use the lower spray pressures recommended for the nozzle. Higher pressure reduces droplet size and does not improve canopy penetration. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of nozzles:** Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle orientation:** Orienting nozzles so that the spray is released backwards, parallel to the airstream, will produce larger droplets than other orientations. Significant deflection from the horizontal will reduce droplet size and increase drift potential.
- **Nozzle type:** Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce larger droplets than other nozzle types.
- **Boom length:** For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length may further reduce drift without reducing swath width.
- **Application height:** Applications should not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces the exposure of the droplets to evaporation and wind.

Swath Adjustment

When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase, with increasing drift potential (higher wind, smaller droplets, etc.).

Wind

Drift potential is lowest between wind speeds of 2 to 10 miles per hour. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Application should be avoided below 2 miles per hour due to variable wind direction and high inversion potential. **NOTE:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect drift.

Temperature and Humidity

When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions

Applications should not occur during a temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion,

while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

Sensitive Areas

This product should only be applied when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

Aircraft Maintenance

PROLONGED EXPOSURE OF THIS PRODUCT TO UNCOATED STEEL SURFACES MAY RESULT IN CORROSION AND POSSIBLE FAILURE OF THE PART. The maintenance of an organic coating (paint) which meets aerospace specification MIL-C-38413 may prevent corrosion. To prevent corrosion of exposed parts, thoroughly wash aircraft after each day of spraying to remove residues of this product accumulated during spraying or from spills. Landing gear is most susceptible.

7.2 Ground Broadcast Equipment

When used according to label directions this product will give control or partial control of herbaceous weeds, woody brush and trees listed in the "WEEDS CONTROLLED" section of this label. Use the recommended rates of this product in 3 to 40 gallons of water per acre as a broadcast spray unless otherwise specified. As density of weeds increases, spray volume should be increased within the recommended range to ensure complete coverage. Carefully select proper nozzles to avoid spraying a fine mist. For best results with ground application equipment, use flat-fan nozzles. Check for even distribution of spray droplets.

7.3 Hand-Held Equipment

Apply to foliage of vegetation to be controlled. For applications made on a spray-to-wet basis, spray coverage should be uniform and complete. Do not spray to the point of runoff. Use coarse sprays only.

For low-volume directed spray applications, use a 4- to 8-percent solution of this product for control or partial control of annual weeds, perennial weeds, or woody brush and trees. Spray coverage should be uniform with at least 50 to 75 percent of the foliage contacted. Coverage of the top one-half of the plant is important for best results. If a straight stream nozzle is used, start the application at the top of the targeted vegetation and spray from top to bottom in a lateral zig-zag motion. For flat-fan and cone nozzles and with hand-directed mist blowers, mist the application over the foliage of the targeted vegetation. To ensure adequate spray coverage, spray both sides of large or tall woody brush and trees, when foliage is thick and dense, or where there are multiple sprouts. For best results, apply to actively growing woody brush and trees after full leaf expansion and before fall color and leaf drop.

Unless otherwise specified, use the recommended rates listed in the following "Application Rates" table for various methods of foliar application using high-volume, backpack, knapsack and similar types of hand-held equipment. When used according to label directions this product will give control or partial control of herbaceous weeds, woody brush and trees listed in the "WEEDS CONTROLLED" section of this label.

APPLICATION RATES		
APPLICATION	AQUAMASTER	SPRAY VOLUME GALLONS/ACRE
SPRAY-TO-WET		
Handgun or Backpack	0.5 to 1.5% by volume	spray-to-wet*
LOW-VOLUME DIRECTED SPRAY		
Backpack	4 to 8% by volume	15 to 25**
Modified High-Volume	1.5 to 3% by volume	40 to 60**

*For applications made on a spray-to-wet basis, spray coverage should be uniform and complete. Do not spray to the point of runoff.

**Low-volume directed applications with backpacks work best when treating weeds and brush less than 10 feet tall. For taller weeds and brush, high-volume handguns can be modified by reducing nozzle size and spray pressure to produce a low-volume directed spray.

7.4 Selective Equipment

This product may be applied through shielded applicators, hooded sprayers, wiper applicators or sponge bars, after dilution and thorough mixing with water, to listed weeds growing in any aquatic or non-crop site specified on this label.

AVOID CONTACT OF HERBICIDE WITH DESIRABLE VEGETATION, AS SERIOUS INJURY OR DEATH IS LIKELY TO OCCUR.

Applicators used above desired vegetation should be adjusted so that the lowest spray stream or wiper contact point is at least 2 inches above the

desirable vegetation. Droplets, mist, foam or splatter of the herbicide solution settling on desirable vegetation is likely to result in discoloration, stunting or destruction.

Better results may be obtained when more of the weed is exposed to the herbicide solution. Weeds not contacted by the herbicide solution will not be affected. This may occur in dense clumps, severe infestations or when the height of the weeds varies so that not all weeds are contacted. In these instances, repeat treatment may be necessary.

Shielded and Hooded Applicators

A shielded or hooded applicator directs the herbicide solution onto weeds, while shielding desirable vegetation from the herbicide. Use nozzles that provide uniform coverage within the treated area. Keep shields on these sprayers adjusted to protect desirable vegetation. EXTREME CARE MUST BE EXERCISED TO AVOID CONTACT OF HERBICIDE WITH DESIRABLE VEGETATION.

Wiper Applicators and Sponge Bars

Wiper applicators are devices that physically wipe appropriate amounts of this product directly onto the weed.

Equipment must be designed, maintained and operated to prevent the herbicide solution from contacting desirable vegetation. Operate this equipment at ground speeds no greater than 5 miles per hour. Performance may be improved by reducing speed in areas of heavy weed infestations to ensure adequate wiper saturation. Better results may be obtained if 2 applications are made in opposite directions.

Avoid leakage or dripping onto desirable vegetation. Adjust height of applicator to ensure adequate contact with weeds. Keep wiping surfaces clean. Be aware that, on sloping ground, the herbicide solution may migrate, causing dripping on the lower end and drying of the wicks on the upper end of a wiper applicator.

Do not use wiper equipment when weeds are wet.

Mix only the amount of solution to be used during a 1-day period, as reduced activity may result from use of leftover solutions. Clean wiper parts immediately after using this product by thoroughly flushing with water.

Nonionic surfactant at a rate of 10 percent by volume of total herbicide solution is recommended with all wiper applications.

For Rope or Sponge Wick Applicators—Solutions ranging from 33 to 75 percent of this product in water may be used.

For Panel Applicators—Solutions ranging from 33 to 100 percent of this product in water may be used in panel wiper applicators.

8.0 SITE AND USE INSTRUCTIONS

Unless otherwise specified, applications may be made to control any weeds listed in the "Annual Weeds", "Perennial Weeds" and "Woody Brush and Trees" rate tables. Refer also to the "Selective Equipment" section.

8.1 Aquatic Sites

This product may be applied to emerged weeds in all bodies of fresh and brackish water which may be flowing, nonflowing or transient. This includes lakes, rivers, streams, ponds, estuaries, rice levees, seeps, irrigation and drainage ditches, canals, reservoirs, wastewater treatment facilities, wildlife habitat restoration and management areas.

This product may also be used to control the labeled weeds, woody brush and trees growing in other terrestrial non-crop sites listed on this label or in aquatic sites within these areas.

If aquatic sites are present in a non-crop area and are part of the intended treatment, read and observe the following directions:

This product does not control plants which are completely submerged or have a majority of their foliage under water.

There is no restriction on the use of treated water for irrigation, recreation or domestic purposes.

Consult local state fish and game agency and water control authorities before applying this product to public water. Permits may be required to treat such water.

NOTE: Do not apply this product **directly to water** within 0.5 mile upstream of an active potable water intake in flowing water (i.e., river, stream, etc.) or within 0.5 mile of an active potable water intake in a standing body of water such as lake, pond or reservoir. To make aquatic applications around and within 0.5 mile of active potable water intakes, the water intake must be turned off for a minimum period of 48 hours after the application. The water intake may be turned on prior to 48 hours if the glyphosate level in the intake water is below 0.7 parts per million as determined by laboratory analysis. These aquatic applications may be made **ONLY** in those cases where there are alternative water sources or holding ponds which would permit the turning off of an active potable

water intake for a minimum period of 48 hours after the applications. This restriction does **NOT** apply to intermittent inadvertent overspray of water in terrestrial use sites.

For treatments after drawdown of water or in dry ditches, allow 7 or more days after treatment before reintroduction of water to achieve maximum weed control. Apply this product within 1 day after drawdown to ensure application to actively growing weeds.

Floating mats of vegetation may require retreatment. Avoid wash-off of sprayed foliage by spray boat or recreational boat backwash or by rainfall within 6 hours of application. Do not retreat within 24 hours following the initial treatment.

Applications made to moving bodies of water must be made while traveling upstream to prevent concentration of this herbicide in water. When making any bankside applications, do not overlap more than 1 foot into open water. Do not spray in bodies of water where weeds do not exist. The maximum application rate of 7.5 pints per acre must not be exceeded in any single broadcast application that is being made over water.

When emerged infestations require treatment of the total surface area of impounded water, treating the area in strips may avoid oxygen depletion due to decaying vegetation. Oxygen depletion may result in fish kill.

Tank Mixtures

Tank mixtures of this product plus 2,4-D amine may be used to increase the spectrum of vegetation controlled in aquatic sites. Use 1.5 to 2 pints of this product plus 2 to 4 pints of 2,4-D amine (4 pounds active ingredient per gallon, labeled for aquatic sites) for control of annual weeds. Use 3 to 7.5 pints of this product plus 2 to 4 quarts of 2,4-D amine (4 pounds per gallon, labeled for aquatic sites) for control or partial control of perennial weeds, woody brush and trees.

When tank mixing, read and carefully observe the label claims, cautionary statements and all information on the labels of all products used. Use according to the most restrictive precautionary statements for each product in the mixture. Mix in the following sequence: Fill sprayer tank one-half full with water, add AquaMaster herbicide, then 2,4-D amine and finally surfactant. Fill sprayer tank to final volume of water.

NOTE: DO NOT MIX AQUAMASTER HERBICIDE AND 2,4-D AMINE CONCENTRATES WITHOUT WATER CARRIER. DO NOT MIX AQUAMASTER HERBICIDE AND 2,4-D AMINE IN BYPASS INJECTOR-TYPE SPRAY EQUIPMENT.

8.2 Cut Stump

Cut stump treatments may be made on any site listed on this label. This product will control many types of woody brush and tree species. Apply this product using suitable equipment to ensure coverage of the entire cambium. Cut trees or resprouts close to the soil surface. Apply a 50- to 100-percent solution of this product to the freshly-cut surface **immediately after** cutting. Delays in application may result in reduced performance. For best results, applications should be made during periods of active growth and full leaf expansion.

For control of *Ailanthus altissima* (Tree-of-heaven) make a cut stump treatment according to the directions in this section using a spray mixture of 50 percent AquaMaster herbicide and 10 percent Arsenal.

DO NOT MAKE CUT STUMP APPLICATIONS WHEN THE ROOTS OF DESIRABLE WOODY BRUSH OR TREES MAY BE GRAFTED TO THE ROOTS OF THE CUT STUMP. Some sprouts, stems, or trees may share the same root system. Adjacent trees having a similar age, height and spacing may signal shared roots. Whether grafted or shared, injury is likely to occur to non-treated stems/trees when one or more trees sharing common roots are treated.

8.3 General Non-Crop Areas and Industrial Sites

Use in areas such as airports, apartment complexes, commercial sites, ditch banks, driveways, dry ditches, dry canals, fencerows, golf courses, greenhouses, industrial sites, lumber yards, manufacturing sites, municipal sites, natural areas, office complexes, ornamentals, parking areas, parks, pastures, petroleum tank farms and pumping installations, railroads, rangeland, recreational areas, residential areas, rights-of-way, roadsides, schools, sod or turf seed farms, sports complexes, storage areas, substations, utility sites, warehouse areas, other public areas, and wildlife management areas.

General Weed Control, Trim-and-Edge and Bare Ground

This product may be used in general non-crop areas. It may be applied with any application equipment described in this label. This product may be used to trim-and-edge around objects in non-crop sites, for spot treatment of unwanted vegetation and to eliminate unwanted weeds growing in established shrub beds or ornamental plantings. This product may be used prior to planting an area to ornamentals, flowers, turfgrass (sod or seed), or prior to laying asphalt or beginning construction projects.

Repeated applications of this product may be used, as weeds emerge, to maintain bare ground.

TANK MIXTURES: This product may be tank-mixed with the following products. Refer to these products' labels for approved non-crop sites and application rates.

Arsenal®	Outrider®
Barricade® 65WG	Pendulum® 3.3 EC
Certainty®	Pendulum WDG
diuron	Plateau®
Endurance®	Princep® DF
Escort®	Princep Liquid
Garlon® 3A	Ronstar® 50 WP
Garlon 4	Sahara®
Hyvar® X	simazine
Karmex® DF	Surflan®
Krovar® I DF	Telar®
Oust®	2,4-D

This product plus dicamba tank mixtures may not be applied by air in California.

Brush Control Tank Mixtures

TANK MIXTURES: Tank mixtures of this product may be used to increase the spectrum of control for herbaceous weeds, woody brush and trees. When tank mixing, read and carefully observe the label claims, cautionary statements and all information on the labels of all products used. Use according to the most restrictive precautionary statements for each product in the mixture. Any recommended rate of this product may be used in a tank mix.

For control of herbaceous weeds, use the lower recommended tank mixture rates. For control of dense stands or tough-to-control woody brush and trees, use the higher recommended rates.

NOTE: For side trimming treatments, it is recommended that this product be used alone or in tank mixture with Garlon 4.

PRODUCT	BROADCAST RATE
Arsenal	6 to 32 fluid ounces per acre
Escort	1 to 2 ounces per acre
Garlon 3A*, Garlon 4	1 to 4 quarts per acre
PRODUCT	SPRAY-TO-WET RATES
Arsenal	0.06 to 0.12% by volume
Escort	1 to 2 ounces per acre
PRODUCT	LOW-VOLUME DIRECTED SPRAY RATES
Arsenal	0.1 to 0.5% by volume
Escort	1 to 2 ounces per acre

* Ensure that Garlon 3A is thoroughly mixed with water according to label directions before adding this product. Have spray mixture agitating at the time this product is added to avoid spray compatibility problems.

8.4 Habitat Management

Habitat Restoration and Management

This product may be used to control exotic and other undesirable vegetation in habitat management and natural areas, including riparian and estuarine areas, rangeland and wildlife refuges. Applications can be made to allow recovery of native plant species, prior to planting desirable native species, and for similar broad-spectrum vegetation control requirements. Spot treatments can be made to selectively remove unwanted plants for habitat management and enhancement.

Wildlife Food Plots

This product may be used as a site preparation treatment prior to planting wildlife food plots. Any wildlife food species may be planted after applying this product, or native species may be allowed to repopulate the area. If tillage is needed to prepare a seedbed, wait 7 days after application before tillage to allow translocation into underground plant parts.

8.5 Injection and Frill (Woody Brush and Trees)

This product may be used to control woody brush and trees by injection or frill applications. Apply this product using suitable equipment that must penetrate into the living tissue. Apply the equivalent of 1/25 fluid ounce (1 milliliter) of this product per each 2 to 3 inches of trunk diameter at breast height (DBH). This is best achieved by applying a 50- to 100-percent concentration of this product either to a continuous frill around the tree or as cuts evenly spaced around the tree below all branches. As tree diameter increases in size, better results are achieved by applying diluted material to a continuous frill or more closely spaced cuttings. Avoid application techniques that allow runoff to occur from frilled or cut areas in species that exude sap freely. In species such as this, make the frill or cuts at an oblique angle to produce a cupping effect and use a

100-percent concentration of this product. For best results, application should be made during periods of active growth and after full leaf expansion.

8.6 Roadsides

All of the instructions in the "General Non-Crop Areas and Industrial Sites" section apply to roadsides.

Shoulder Treatments

This product may be used on road shoulders. It may be applied with boom sprayers, shielded boom sprayers, high-volume off-center nozzles, hand-held equipment, and similar equipment.

Guardrails and Other Obstacles to Mowing

This product may be used to control weeds growing under guardrails and around signposts and other objects along the roadside.

Spot Treatment

This product may be used as a spot treatment to control unwanted vegetation growing along roadsides.

TANK MIXTURES: This product may be tank-mixed with the following products for shoulder, guardrail, spot and bare ground treatments, provided that the specific tank mixture product is labeled for this site:

diuron	Princep DF
Endurance	Princep Liquid
Escort	Ronstar 50 WP
Garlon 4	Sahara
Krovar I DF	simazine
Oust	Surflan
Outrider	Telar
Pendulum 3.3 EC	2,4-D
Pendulum WDG	

See the "MIXING" section of this label for general instructions for tank mixing.

Release of Bermudagrass or Bahiagrass

Dormant Applications

This product may be used to control or partially control many winter annual weeds and tall fescue for effective release of dormant Bermudagrass or bahiagrass. Treat only when turf is dormant and prior to spring greenup. This product may also be tank mixed with Outrider herbicide or Oust for residual control. Tank mixtures of this product with Oust may delay greenup.

For best results on winter annuals, treat when plants are in an early growth stage (below 6 inches in height) after most have germinated. For best results on tall fescue, treat when fescue is at or beyond the 4- to 6-leaf stage.

Apply 6 to 48 fluid ounces of this product in a tank mixture with 0.75 to 1.33 ounces Outrider herbicide per acre. Read and follow all label directions for Outrider herbicide.

TANK MIXTURES: Apply 6 to 48 fluid ounces of this product per acre alone or in a tank mixture with 0.25 to 1 ounce per acre of Oust. Apply the recommended rates in 10 to 40 gallons of water per acre. Use only in areas where Bermudagrass or bahiagrass are desirable ground covers and where some temporary injury or discoloration can be tolerated. To avoid delays in greenup and minimize injury, add no more than 1 ounce of Oust per acre on Bermudagrass and no more than 0.5 ounce of Oust per acre on bahiagrass and avoid treatments when these grasses are in a semi-dormant condition.

Actively Growing Bermudagrass

This product may be used to control or partially control many annual and perennial weeds for effective release of actively growing Bermudagrass. Apply 12 to 36 fluid ounces of this product in 10 to 40 gallons of spray solution per acre. Use the lower rate when treating annual weeds below 6 inches in height (or runner length). Use the higher rate as weeds increase in size or as they approach flower or seedhead formation. These rates will also provide partial control of the following perennial species:

Bahiagrass	Johnsongrass
Bluestem, silver	Trumpet creeper
Fescue, tall	Vaseygrass

This product may be tank-mixed with Outrider herbicide for control or partial control of Johnsongrass and other weeds listed in the Outrider herbicide label. Use 6 to 24 ounces of this product with 0.75 to 1.33 ounces of Outrider herbicide per acre. Use the higher rates of both products for control of perennial weeds or annual weeds greater than 6 inches in height.

TANK MIXTURES: This product may be tank-mixed with Oust. If tank-mixed, use no more than 12 to 24 fluid ounces of this product with 1 to 2 ounces of Oust per acre. Use the lower rates of each product to control annual weeds less than 6 inches in height or runner length that are listed in this label and the Oust label. Use the higher rates as annual weeds increase in size and approach the flower or seedhead stages. These rates will also provide partial control of the following perennial weeds:

Bahiagrass	Fescue, tall
Bluestem, silver	Johnsongrass
Broomsedge	Poorjoe
Dallisgrass	Trumpet creeper
Dock, curly	Vaseygrass
Dogfennel	Vervain, blue

Use only on well-established Bermudagrass. Bermudagrass injury may result from the treatment, but regrowth will occur under moist conditions. Repeat applications of the tank mix in the same season are not recommended, since severe injury may occur.

Actively Growing Bahiagrass

For suppression of vegetative growth and seedhead inhibition of bahiagrass for approximately 45 days, apply 4 fluid ounces of this product in 10 to 40 gallons of water per acre. Apply 1 to 2 weeks after full greenup or after mowing to a uniform height of 3 to 4 inches. This application must be made prior to seedhead emergence.

For suppression up to 120 days, apply 3 fluid ounces of this product per acre, followed by an application of 2 to 3 fluid ounces per acre about 45 days later. Make no more than 2 applications per year.

This product may be used for control or partial control of Johnsongrass and other weeds listed on the Outrider herbicide label in actively growing bahiagrass. Apply 1.5 to 3.5 fluid ounces of this product with 0.75 to 1.33 ounces of Outrider herbicide per acre. Use the higher rates for control of perennial weeds or annual weeds greater than 6 inches in height. Use only on well established bahiagrass.

TANK MIXTURES: A tank mixture of this product plus Oust may be used. Apply 4 fluid ounces of this product plus 0.25 ounce of Oust per acre 1 to 2 weeks following an initial spring mowing. Make only one application per year.

9.0 WEEDS CONTROLLED

Always use the higher rate of this product per acre within the recommended range when weed growth is heavy or dense or weeds are growing in an undisturbed (noncultivated) area.

Reduced results may occur when treating weeds heavily covered with dust. For weeds that have been mowed, grazed or cut, allow regrowth to occur prior to treatment.

Refer to the following label sections for recommended rates for the control of annual and perennial weeds and woody brush and trees. For difficult to control perennial weeds and woody brush and trees, where plants are growing under stressed conditions, or where infestations are dense, this product may be used at 4.5 to 8 quarts per acre for enhanced results.

9.1 Annual Weeds

Apply to actively growing annual grasses and broadleaf weeds.

Allow at least 3 days after application before disturbing treated vegetation. After this period the weeds may be mowed, tilled or burned. See the "GENERAL INFORMATION", "MIXING", and "APPLICATION EQUIPMENT AND TECHNIQUES" sections for labeled uses and specific application instructions.

Use 1.5 pints per acre if weeds are less than 6 inches in height or runner length and 1 to 4 quarts per acre if weeds are over 6 inches in height or runner length or when weeds are growing under stressed conditions.

For spray-to-wet applications, apply a 0.5-percent solution of this product to weeds less than 6 inches in height or runner length. Apply prior to seedhead formation in grass or bud formation in broadleaf weeds. For annual weeds over 6 inches tall, or for smaller weeds growing under stressed conditions, use a 0.75- to 1.5-percent solution. Use the higher rate for tough-to-control species or for weeds over 24 inches tall.

WEED SPECIES

Anoda, spurred	Cheeseweed
Balsamapple**	(<i>Malva parviflora</i>)
Barley*	Chervil*
Barnyardgrass*	Chickweed*
Bittercress*	Cocklebur*
Black nightshade*	Copperleaf, hophornbeam
Bluegrass, annual*	Corn*
Bluegrass, bulbous*	Corn speedwell*
Bassia, fivehook	Crabgrass*
Brome, downy*	Dwarf dandelion*
Brome, Japanese*	Eastern mannagrass*
Broomsedge	Eclipta*
Browntop panicum*	Fall panicum*
Buttercup*	Falsedandelion*
Carolina foxtail*	Falseflax, smallseed*
Carolina geranium	Fiddleneck
Castor bean	Field pennycress*
Cheatgrass*	Filaree

WEED SPECIES (Cont'd)

Fleabane, annual*	Ragweed, common*
Fleabane, hairy	Ragweed, giant
(<i>Conyza bonariensis</i>)*	Red rice
Fleabane, rough*	Russian thistle
Florida pusley	Rye*
Foxtail*	Ryegrass*
Goatgrass, jointed*	Sandbur, field*
Goosegrass	Shattercane*
Grain sorghum (milo)*	Shepherd's-purse*
Groundsel, common*	Sicklepod
Hemp sesbania	Signalgrass, broadleaf*
Henbit	Smartweed, ladythumb*
Horseweed/Marestail	Smartweed, Pennsylvania*
(<i>Conyza canadensis</i>)	Sowthistle, annual
Itchgrass*	Spanishneedles***
Johnsongrass, seedling	Speedwell, purslane*
Junglerice	Sprangletop*
Knotweed	Spurge, annual
Kochia	Spurge, prostrate*
Lamb's-quarters*	Spurge, spotted*
Little barley*	Spurry, umbrella*
London rocket*	Starthistle, yellow
Mayweed	Stinkgrass*
Medusahead*	Sunflower*
Morningglory	Teaweed/Prickly sida
(<i>Ipomoea spp.</i>)	Texas panicum*
Mustard, blue*	Velvetleaf
Mustard, tansy*	Virginia copperleaf
Mustard, tumble*	Virginia pepperweed*
Mustard, wild*	Wheat*
Oats	Wild oats*
Pigweed*	Witchgrass*
Plains/Tickseed coreopsis*	Woolly cupgrass*
Prickly lettuce*	Yellow rocket
Puncturevine	
Purslane, common	

*When using field broadcast equipment (aerial applications or boom sprayers using flat-fan nozzles) these species will be controlled or partially controlled using 12 fluid ounces of this product per acre. Applications must be made using 3 to 10 gallons of carrier volume per acre. Use nozzles that ensure thorough coverage of foliage and treat when weeds are in an early growth stage.

** Apply with hand-held equipment only.

*** Apply 3 pints of this product per acre.

9.2 Perennial Weeds

Best results are obtained when perennial weeds are treated after they reach the reproductive stage of growth (seedhead initiation in grasses and bud formation in broadleaves). For non-flowering plants, best results are obtained when the plants reach a mature stage of growth. In many situations treatments are required prior to these growth stages. Under these conditions, use the higher application rate within the recommended range.

Ensure thorough coverage when using spray-to-wet treatments using hand-held equipment. When using hand-held equipment for low-volume directed spot treatments, apply a 4- to 8-percent solution of this product.

Allow 7 or more days after application before tillage. If weeds have been mowed or tilled, do not treat until regrowth has reached the recommended stages. Fall treatments must be applied before a killing frost.

Repeat treatments may be necessary to control weeds regenerating from underground parts or seed.

WEED SPECIES	RATE (QT/A)	HAND-HELD % SOLUTION
Alfalfa*	0.7	1.5
Alligatorweed*	3.0	1.3
Anise (fennel)	1.5 - 3.0	1.0 - 1.5
Bahiagrass	2.3 - 3.75	1.5
Beachgrass, European	—	3.5
(<i>Ammophila arenaria</i>)	1.0	1.5
Bentgrass*	4.0	1.5
Bermudagrass		
Bermudagrass, water	1.0	1.5
(knotgrass)	3.0 - 3.75	1.5
Bindweed, field	1.5 - 2.3	0.75
Bluegrass, Kentucky	3.0 - 3.75	1.5
Blueweed, Texas	2.3 - 3.0	0.75 - 1.0
Brackenfern	1.5 - 2.3	0.75
Bromegrass, smooth	—	1.5
Bursage, woolly-leaf	1.5 - 2.3	0.75
Canarygrass, reed		

WEED SPECIES	RATE (QT/A)	HAND-HELD % SOLUTION
Cattail	2.3 - 3.75	0.75
Clover; red, white	2.3 - 3.75	1.5
Cogongrass	2.3 - 3.75	1.5
Cordgrass	2.3 - 3.75	1.0 - 2.0
Cutgrass, giant	3.0	1.0
Dallisgrass	2.3 - 3.75	1.5
Dandelion	2.3 - 3.75	1.5
Dock, curly	2.3 - 3.75	1.5
Dogbane, hemp	3.0	1.5
Fescue (except tall)	2.3 - 3.75	1.5
Fescue, tall	2.3	1.0
Guineagrass	2.3	0.75
Horsenettle	2.3 - 3.75	1.5
Horseradish	3.0	1.5
Iceplant	1.5	1.5
Ivy; German, cape	1.5 - 3.0	0.75 - 1.5
Jerusalem artichoke	2.3 - 3.75	1.5
Johnsongrass	1.5 - 2.3	0.75
Kikuyugrass	1.5 - 2.3	0.75
Knapweed	3.0	1.5
Lantana	—	0.75 - 1.0
Lespedeza	2.3 - 3.75	1.5
Loosestrife, purple	2.0	1.0 - 1.5
Lotus, American	2.0	0.75
Maidencane	3.0	0.75
Milkweed, common	2.3	1.5
Muhly, wirestem	1.5 - 2.3	0.75
Mullein, common	2.3 - 3.75	1.5
Napiergrass	2.3 - 3.75	1.5
Nightshade, silverleaf	3.0 - 3.75	1.5
Nutsedge; purple, yellow	2.3	0.75
Orchardgrass	1.5 - 2.3	0.75
Pampasgrass	2.3 - 3.75	1.5
Paragrass	3.0	0.75
Pepperweed, perennial	3.0	1.5
Phragmites*	2.0 - 3.75	0.75 - 1.5
Poison hemlock	1.5 - 3.0	0.75 - 1.5
Quackgrass	1.5 - 2.3	0.75
Redvine*	1.5	1.5
Reed, giant		
(<i>Arundo donax</i>)	3.0 - 3.75	1.5
Ryegrass, perennial	1.5 - 2.3	0.75
Salvinia, (<i>spp.</i>)	—	2.0
Smartweed, swamp	2.3 - 3.75	1.5
Spatdock	3.0	0.75
Spurge, leafy*	—	1.5
Starthistle, Yellow	—	1.5
Sweet potato, wild*	—	1.5
Thistle, artichoke	1.5 - 2.3	2.0
Thistle, Canada	1.5 - 2.3	1.5
Timothy	1.5 - 2.3	1.5
Torpedograss*	3.0 - 3.75	0.75 - 1.5
Trumpet creeper*	1.5 - 2.3	1.5
Tules, common	—	1.5
Vaseygrass	2.3 - 3.75	1.5
Velvetgrass	2.3 - 3.75	1.5
Waterhyacinth	2.5 - 3.0	0.75 - 1.0
Waterlettuce	—	0.75 - 1.0
Waterprimrose	—	0.75
Wheatgrass, western	1.5 - 2.3	0.75

*Partial control

Alligatorweed—Apply 6 pints of this product per acre as a broadcast spray or as a 1.3-percent solution with hand-held equipment to provide partial control of alligatorweed. Apply when most of the target plants are in bloom. Repeat applications will be required to maintain such control.

Beachgrass, European—Apply an 8-percent solution of this products plus 0.5- to 1.5-percent nonionic surfactant on a low-volume spray-to-wet basis. Best results are obtained when applications are made when European beachgrass is actively growing through the boot to the full heading stages of growth. Make applications prior to the loss of more than 50 percent green leaf color in the fall. Do not treat when weeds are under drought stress. Repeat applications may be necessary.

Bermudagrass—Apply 7.5 pints of this product per acre as a broadcast spray or as a 1.5-percent solution with hand-held equipment. Apply when target plants are actively growing and when seedheads appear.

Bindweed, field / Silverleaf Nightshade / Texas Blueweed—Apply 6 to 7.5 pints of this product per acre as a broadcast spray west of the Mississippi River and 4.5 to 6 pints of this product per acre east of the Mississippi River. With hand-held equipment, use a 1.5-percent solution. Apply when target plants are actively growing and are at or beyond full bloom. For silverleaf nightshade, best results can be obtained when appli-

cation is made after berries are formed. Do not treat when weeds are under drought stress. New leaf development indicates active growth. For best results apply in late summer or fall.

Brackenfern—Apply 4.5 to 6 pints of this product per acre as a broadcast spray or as a 0.75- to 1-percent solution with hand-held equipment. Apply to fully expanded fronds which are at least 18 inches long.

Cattail—Apply 4.5 to 6 pints of this product per acre as a broadcast spray or as a 0.75-percent solution with hand-held equipment. Apply when target plants are actively growing and are at or beyond the early-to-full bloom stage of growth. Best results are achieved when application is made during the summer or fall months.

Cogongrass—Apply 4.5 to 7.5 pints of this product per acre as a broadcast spray. Apply when cogongrass is at least 18 inches tall and actively growing in late summer or fall. Allow 7 or more days after application before tillage or mowing. Due to uneven stages of growth and the dense nature of vegetation preventing good spray coverage, repeat treatments may be necessary to maintain control.

Cordgrass—Apply 4.5 to 7.5 pints of this product per acre as a broadcast spray or as a 1- to 2-percent solution with hand-held equipment. Schedule applications in order to allow 6 hours before treated plants are covered by tidewater. The presence of debris and silt on the cordgrass plants will reduce performance. It may be necessary to wash targeted plants prior to application to improve uptake of this product into the plant.

Cutgrass, giant—Apply 6 pints of this product per acre as a broadcast spray or as a 1-percent solution with hand-held equipment to provide partial control of giant cutgrass. Repeat applications will be required to maintain such control, especially where vegetation is partially submerged in water. Allow for substantial regrowth to the 7- to 10-leaf stage prior to retreatment.

Dogbane, hemp / Knapweed / Horseradish—Apply 6 pints of this product per acre as a broadcast spray or as a 1.5-percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached the late bud-to-flower stage of growth. For best results, apply in late summer or fall.

Fescue, tall—Apply 4.5 pints of this product per acre as a broadcast spray or as a 1-percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached the boot-to-head stage of growth. When applied prior to the boot stage, less desirable control may be obtained.

Guineagrass—Apply 4.5 pints of this product per acre as a broadcast spray or as a 0.75-percent solution with hand-held equipment. Apply when target plants are actively growing and when most have reached at least the 7-leaf stage of growth.

Johnsongrass / Bluegrass, Kentucky / Bromegrass, smooth / Canarygrass, reed / Orchardgrass / Ryegrass, perennial / Timothy / Wheatgrass, western—Apply 3 to 4.5 pints of this product per acre as a broadcast spray or as a 0.75-percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached the boot-to-head stage of growth. When applied prior to the boot stage, less desirable control may be obtained. In the fall, apply before plants have turned brown.

Lantana—Apply this product as a 0.75- to 1-percent solution with hand-held equipment. Apply to actively growing lantana at or beyond the bloom stage of growth. Use the higher application rate for plants that have reached the woody stage of growth.

Loosestrife, purple—Apply 4 pints of this product per acre as a broadcast spray or as a 1- to 1.5-percent solution using hand-held equipment. Treat when plants are actively growing at or beyond the bloom stage of growth. Best results are achieved when application is made during summer or fall months. Fall treatments must be applied before a killing frost.

Lotus, American—Apply 4 pints of this product per acre as a broadcast spray or as a 0.75-percent solution with hand-held equipment. Treat when plants are actively growing at or beyond the bloom stage of growth. Best results are achieved when application is made during summer or fall months. Fall treatments must be applied before a killing frost. Repeat treatments may be necessary to control regrowth from underground parts and seeds.

Maidencane / Paragrass—Apply 6 pints of this product per acre as a broadcast spray or as a 0.75-percent solution with hand-held equipment. Repeat treatments will be required, especially to vegetation partially submerged in water. Under these conditions, allow for regrowth to the 7- to 10-leaf stage prior to retreatment.

Milkweed, common—Apply 4.5 pints of this product per acre as a broadcast spray or as a 1.5-percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached the late bud-to-flower stage of growth.

Nutsedge; purple, yellow—Apply 4.5 pints of this product per acre as a broadcast spray, or as a 0.75-percent solution with hand-held equipment to control existing nutsedge plants and immature nutlets attached to treated plants. Apply when target plants are in flower or when new nutlets can be found at rhizome tips. Nutlets which have not germinated will not be controlled and may germinate following treatment. Repeat treatments will be required for long-term control.

Pampasgrass—Apply a 1.5-percent solution of this product with hand-held equipment when plants are actively growing.

Phragmites—For partial control of phragmites in Florida and the counties of other states bordering the Gulf of Mexico, apply 7.5 pints per acre as a broadcast spray or apply a 1.5-percent solution with hand-held equipment. In other areas of the U.S., apply 4 to 6 pints per acre as a broadcast spray or apply a 0.75-percent solution with hand-held equipment for partial control. For best results, treat during late summer or fall months when plants are actively growing and in full bloom. Due to the dense nature of the vegetation, which may prevent good spray coverage and uneven stages of growth, repeat treatments may be necessary to maintain control. Visual control symptoms will be slow to develop.

Quackgrass / Kikuyugrass / Muhly, wirestem—Apply 3 to 4.5 pints of this product per acre as a broadcast spray or as a 0.75-percent solution with hand-held equipment when most quackgrass or wirestem muhly is at least 8 inches in height (3- to 4-leaf stage of growth) and actively growing. Allow 3 or more days after application before tillage.

Reed, giant / Ice Plant—For control of giant reed and ice plant, apply a 1.5-percent solution of this product with hand-held equipment when plants are actively growing. For giant reed, best results are obtained when applications are made in late summer to fall.

Spatterdock—Apply 6 pints of this product per acre as a broadcast spray or as a 0.75-percent solution with hand-held equipment. Apply when most plants are in full bloom. For best results, apply during the summer or fall months.

Sweet potato, wild—Apply this product as a 1.5-percent solution using hand-held equipment. Apply to actively growing weeds that are at or beyond the bloom stage of growth. Repeat applications will be required. Allow the plant to reach the recommended stage of growth before retreatment.

Thistle; Canada, artichoke—Apply 3 to 4.5 pints of this product per acre as a broadcast spray or as a 1.5-percent solution with hand-held equipment for Canada thistle. To control artichoke thistle, apply a 2-percent solution as a spray-to-wet application. Apply when target plants are actively growing and are at or beyond the bud stage of growth.

Torpedograss—Apply 6 to 7.5 pints of this product per acre as a broadcast spray or as a 0.75- to 1.5-percent solution with hand-held equipment to provide partial control of torpedograss. Use the lower rates under terrestrial conditions, and the higher rates under partially submerged or a floating mat condition. Repeat treatments will be required to maintain such control.

Tules, common—Apply this product as a 1.5-percent solution with hand-held equipment. Apply to actively growing plants at or beyond the seedhead stage of growth. After application, visual symptoms will be slow to appear and may not occur for 3 or more weeks.

Waterhyacinth—Apply 5 to 6 pints of this product per acre as a broadcast spray or apply a 0.75- to 1-percent solution with hand-held equipment. Apply when target plants are actively growing and at or beyond the early bloom stage of growth. After application, visual symptoms may require 3 or more weeks to appear with complete necrosis and decomposition usually occurring within 60 to 90 days. Use the higher rates when more rapid visual effects are desired.

Waterlettuce—For control, apply a 0.75- to 1-percent solution of this product with hand-held equipment to actively growing plants. Use higher rates where infestations are heavy. Best results are obtained from mid-summer through winter applications. Spring applications may require retreatment.

Waterprimrose—Apply this product as a 0.75-percent solution using hand-held equipment. Apply to plants that are actively growing at or beyond the bloom stage of growth, but before fall color changes occur. Thorough coverage is necessary for best control.

Other perennials listed on this label—Apply 4.5 to 7.5 pints of this product per acre as a broadcast spray or as a 0.75- to 1.5-percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached early head or early bud stage of growth.

9.3 Woody Brush and Trees

Apply this product after full leaf expansion, unless otherwise directed. Use the higher rate for larger plants and/or dense areas of growth. On vines, use the higher rate for plants that have reached the woody stage of growth. Best results are obtained when application is made in late summer or fall after fruit formation.

In arid areas, best results are obtained when applications are made in the spring to early summer when brush species are at high moisture content and are flowering.

Ensure thorough coverage when using spray-to-wet treatments using hand-held equipment. When using hand-held equipment for low-volume directed-spray spot treatments, apply a 4- to 8-percent solution of this product.

Symptoms may not appear prior to frost or senescence with fall treatments.

Allow 7 or more days after application before tillage, mowing or removal. Repeat treatments may be necessary to control plants regenerating from underground parts or seed. Some autumn colors on undesirable deciduous species are acceptable provided no major leaf drop has occurred. Reduced performance may result if fall treatments are made following a frost.

WEED SPECIES	BROADCAST RATE (QT/A)	HAND-HELD SPRAY-TO-WET % SOLUTION
Alder	2.3 - 3.0	0.75 - 1.2
Ash*	1.5 - 3.75	0.75 - 1.5
Aspen, quaking	1.5 - 2.3	0.75 - 1.2
Bearclover (Bearnat)*	1.5 - 3.75	0.75 - 1.5
Beech*	1.5 - 3.75	0.75 - 1.5
Birch	1.5	0.75
Blackberry	2.3 - 3.0	0.75 - 1.2
Blackgum	1.5 - 3.75	0.75 - 1.5
Bracken	1.5 - 3.75	0.75 - 1.5
Broom; French, Scotch	1.5 - 3.75	1.2 - 1.5
Buckwheat, California*	1.5 - 3.0	0.75 - 1.5
Cascara*	1.5 - 3.75	0.75 - 1.5
Castor bean	—	1.5
Catsclaw*	—	1.2 - 1.5
Ceanothus*	1.5 - 3.75	0.75 - 1.5
Chamise*	1.5 - 3.75	0.75
Cherry; bitter, black, pin	1.5 - 3.75	1.0 - 1.5
Cottonwood, eastern	1.5 - 3.75	0.75 - 1.5
Coyote brush	2.3 - 3.0	1.2 - 1.5
Cypress; swamp, bald	1.5 - 3.75	0.75 - 1.5
Deerweed	1.5 - 3.75	0.75 - 1.5
Dewberry	2.3 - 3.0	0.75 - 1.2
Dogwood*	3.0 - 3.75	1.0 - 2.0
Elderberry	1.5	0.75
Elm*	1.5 - 3.75	0.75 - 1.5
Eucalyptus	—	1.5
Gallberry	1.5 - 3.75	0.75 - 1.5
Gorse*	1.5 - 3.75	0.75 - 1.5
Hackberry, western	1.5 - 3.75	0.75 - 1.5
Hasardia*	1.5 - 3.0	0.75 - 1.5
Hawthorn	1.5 - 2.3	0.75 - 1.2
Hazel	1.5	0.75
Hickory*	3.0 - 3.75	1.0 - 2.0
Honeysuckle	2.3 - 3.0	0.75 - 1.2
Hornbeam, American*	1.5 - 3.75	0.75 - 1.5
Huckleberry	1.5 - 3.75	0.75 - 1.5
Knotweed; Japanese, Giant**	—	—
Kudzu	3.0	1.5
Locust, black*	1.5 - 3.0	0.75 - 1.5
Madrone sprouts*	—	1.5
Magnolia, sweetbay	1.5 - 3.75	0.75 - 1.5
Manzanita*	1.5 - 3.75	0.75 - 1.5
Maple, red	1.0 - 3.75	0.75 - 1.2
Maple, sugar	—	0.75 - 1.2
Maple, vine*	1.5 - 3.75	0.75 - 1.5
Monkey flower*	1.5 - 3.0	0.75 - 1.5
Oak; black, white*	1.5 - 3.0	0.75 - 1.5
Oak, northern pin	1.5 - 3.0	0.75 - 1.2
Oak, post	2.3 - 3.0	0.75 - 1.2
Oak, red	—	0.75 - 1.2
Oak, Scrub*	1.5 - 3.0	0.75 - 1.5
Oak, southern red	1.5 - 3.75	1.0 - 1.5
Orange, Osage	1.5 - 3.75	0.75 - 1.5
Peppertree, Brazilian (Florida holly)*	1.5 - 3.75	1.5
Persimmon*	1.5 - 3.75	0.75 - 1.5
Pine	1.5 - 3.75	0.75 - 1.5
Poison ivy	3.0 - 3.75	1.5
Poison oak	3.0 - 3.75	1.5
Poplar, yellow*	1.5 - 3.75	0.75 - 1.5
Prunus	1.5 - 3.75	1.0 - 1.5
Raspberry	2.3 - 3.0	0.75 - 1.2
Redbud, eastern	1.5 - 3.75	0.75 - 1.5
Redcedar, eastern	1.5 - 3.75	0.75 - 1.5
Rose, multiflora	1.5	0.75
Russian olive*	1.5 - 3.75	0.75 - 1.5
Sage, black	1.5 - 3.0	0.75
Sage, white*	1.5 - 3.0	0.75 - 1.5

WEED SPECIES	BROADCAST RATE (QT/A)	HAND-HELD SPRAY-TO-WET % SOLUTION
Sage brush, California	1.5 - 3.0	0.75
Salmonberry	1.5	0.75
Saltbush	—	1.0
Saltcedar**	1.5 - 3.75	0.75 - 1.5
Sassafras*	1.5 - 3.75	0.75 - 1.5
Sea Myrtle	—	1.0
Sourwood*	1.5 - 3.75	0.75 - 1.5
Sumac; laurel, poison, smooth, sugarbush, winged*	1.5 - 3.0	0.75 - 1.5
Sweetgum	1.5 - 2.3	0.75 - 1.5
Swordfern*	1.5 - 3.75	0.75 - 1.5
Tallowtree, Chinese	—	0.75
Tan oak resprouts*	—	1.5
Thimbleberry	1.5	0.75
Tobacco, tree*	1.5 - 3.0	0.75 - 1.5
Toyon*	—	1.5
Trumpet creeper	1.5 - 2.3	0.75 - 1.2
Vine maple*	1.5 - 3.75	0.75 - 1.5
Virginia creeper	1.5 - 3.75	0.75 - 1.5
Waxmyrtle, southern*	1.5 - 3.75	1.5
Willow	2.3	0.75
Yerba Santa*	—	1.5

*Partial control

**Refer to specific instructions below

Alder / Blackberry / Dewberry / Honeysuckle / Oak, post / Raspberry—For control, apply 4.5 to 6 pints per acre as a broadcast spray or as a 0.75- to 1.2-percent solution with hand-held equipment.

Aspen, quaking / Hawthorn / Trumpet creeper—For control, apply 3 to 4.5 pints of this product per acre as a broadcast spray or as a 0.75- to 1.2-percent solution with hand-held equipment.

Birch / Elderberry / Hazel / Salmonberry / Thimbleberry—For control, apply 3 pints per acre of this product as a broadcast spray or as a 0.75-percent solution with hand-held equipment.

Broom; French, Scotch—For control, apply a 1.2- to 1.5-percent solution with hand-held equipment.

Buckwheat, California / Hasardia / Monkey flower / Tobacco, tree—For partial control of these species, apply a 0.75- to 1.5-percent solution of this product as a foliar spray with hand-held equipment. Thorough coverage of foliage is necessary for best results.

Castor bean—For control, apply a 1.5-percent solution of this product with hand-held equipment.

Catsclaw—For partial control, apply a 1.2- to 1.5-percent solution with hand-held equipment when at least 50 percent of the new leaves are fully developed.

Cherry; bitter, black, pin / Oak, southern red / Sweetgum / Prunus—For control, apply 3 to 7.5 pints of this product per acre as a broadcast spray or as a 1- to 1.5-percent solution with hand-held equipment.

Coyote brush—For control, apply a 1.2- to 1.5-percent solution with hand-held equipment when at least 50 percent of the new leaves are fully developed.

Dogwood / Hickory—For partial control, apply a 1- to 2-percent solution of this product with hand-held equipment or 6 to 7.5 pints per acre as a broadcast spray.

Eucalyptus, bluegum—For control of eucalyptus resprouts, apply a 1.5-percent solution of this product with hand-held equipment when resprouts are 6- to 12-feet tall. Ensure complete coverage. Apply when plants are actively growing. Avoid application to drought-stressed plants.

Knotweed; Japanese, Giant (*Polygonum cuspidatum* and *P. sachalinense*) Stem Injection. Apply 0.18 fluid ounce (5 milliliters) of this product injected below the 2nd node above the ground of each stem in the clump. Use suitable equipment that must penetrate into the internode region.

Cut Stem. Cut stems cleanly just below the 2nd or 3rd node above the ground. Immediately apply 0.36 fluid ounce (10 milliliter) of a 50-percent solution of this product into the 'well' or remaining internode. Ensure that removed upper plant material is carefully gathered and discarded so that it will not contact soil and regenerate plants from sprouting buds. Use of a bio-barrier such as cardboard, plywood or plastic sheeting is recommended. The combined total for all treatments must not exceed 8 quarts per acre. At 5 milliliters per stem, 8 quarts should treat about 1500 stems

Kudzu—For control, apply 6 pints of this product per acre as a broadcast spray or as a 1.5-percent solution with hand-held equipment. Repeat applications will be required to maintain control.

Maple, red—For control, apply as a 0.75- to 1.2-percent solution with hand-held equipment when leaves are fully developed. For partial control, apply 2 to 7.5 pints of this product per acre as a broadcast spray.

Maple, sugar / Oak, northern pin, red—For control, apply as a 0.75- to 1.2-percent solution with hand-held equipment when at least 50 percent of the new leaves are fully developed.

Peppertree, Brazilian (holly, Florida) / Waxmyrtle, southern—For partial control, apply this product as a 1.5-percent solution with hand-held equipment.

Poison ivy / Poison oak—For control, apply 6 to 7.5 pints of this product per acre as a broadcast spray or as a 1.5-percent solution with hand-held equipment. Repeat applications may be required to maintain control. Fall treatments must be applied before leaves lose green color.

Rose, multiflora—For control, apply 3 pints of this product per acre as a broadcast spray or as a 0.75-percent solution with hand-held equipment. Treatments should be made prior to leaf deterioration by leaf-feeding insects.

Sage, black / Sage brush, California / Chamise / Tallowtree, Chinese—For control of these species, apply a 0.75-percent solution of this product as a foliar spray with hand-held equipment. Thorough coverage of foliage is necessary for best results.

Saltbush, Sea Myrtle—For control, apply this product as a 1-percent solution with hand-held equipment.

Saltcedar—For partial control, apply a 1- to 2-percent solution of this product with hand-held equipment or 6 to 7.5 pints per acre as a broadcast spray. For control, apply a 1- to 2-percent solution of this product mixed with 0.25-percent Arsenal with hand-held equipment. For control using broadcast applications, apply 3 pints of this product in a tank mix with 1 pint of Arsenal to plants less than 6 feet tall. To control saltcedar greater than 6 feet tall using broadcast applications, apply 6 pints of this product in a tank mix with 2 pints of Arsenal.

Willow—For control, apply 4.5 pints of this product per acre as a broadcast spray or as a 0.75-percent solution with hand-held equipment.

Other woody brush and trees listed in this label—For partial control, apply 3 to 7.5 pints of this product per acre as a broadcast spray or as a 0.75- to 1.5-percent solution with hand-held equipment.

10.0 LIMIT OF WARRANTY AND LIABILITY

Monsanto Company warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes set forth in the Complete Directions for Use label booklet ("Directions") when used in accordance with those Directions under the conditions described therein. NO OTHER EXPRESS WARRANTY OR IMPLIED WARRANTY OF FITNESS FOR PARTICULAR PURPOSE OR MERCHANTABILITY IS MADE. This warranty is also subject to the conditions and limitations stated herein.

Buyer and all users shall promptly notify this Company of any claims whether based in contract, negligence, strict liability, other tort or otherwise.

To the fullest extent permitted by law, buyer and all users are responsible for all loss or damage from use or handling which results from conditions beyond the control of this Company, including, but not limited to, incompatibility with products other than those set forth in the Directions, application to or contact with desirable vegetation, unusual weather, weather conditions which are outside the range considered normal at the application site and for the time period when the product is applied, as well as weather conditions which are outside the application ranges set forth in the Directions, application in any manner not explicitly set forth in the Directions, moisture conditions outside the moisture range specified in the Directions, or the presence of products other than those set forth in the Directions in or on the soil, crop or treated vegetation.

This Company does not warrant any product reformulated or repackaged from this product except in accordance with this Company's stewardship requirements and with express written permission from this Company.

THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE LIMIT OF THE LIABILITY OF THIS COMPANY OR ANY OTHER SELLER FOR ANY AND ALL LOSSES, INJURIES OR DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT (INCLUDING CLAIMS BASED IN CONTRACT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE) SHALL BE THE PURCHASE PRICE PAID BY THE USER OR BUYER FOR THE QUANTITY OF THIS PRODUCT INVOLVED, OR, AT THE ELECTION OF THIS COMPANY OR ANY OTHER SELLER, THE REPLACEMENT OF SUCH QUANTITY, OR, IF NOT ACQUIRED BY PURCHASE, REPLACEMENT OF SUCH QUANTITY. TO THE FULLEST EXTENT PERMITTED BY LAW, IN NO EVENT SHALL THIS COMPANY OR ANY OTHER SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES.

Upon opening and using this product, buyer and all users are deemed to have accepted the terms of this LIMIT OF WARRANTY AND LIABILITY which may not be varied by any verbal or written agreement. If terms are not acceptable, return at once unopened.

AquaMaster, Certainty, Outrider, and the Monsanto & Vine symbol are trademarks of Monsanto Technology LLC.

All other trademarks are the property of their respective owners.

EPA Reg. No. 524-343

In case of an emergency involving this product,
or for medical assistance,
Call Collect, day or night, (314) 694-4000.

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ST. LOUIS, MISSOURI, 63167 U.S.A.



ATENCIÓN:

Esta etiqueta de muestra se entrega únicamente para información general.

- Este producto pesticida puede no estar todavía disponible o aprobado para la venta o utilización en su localidad.
- Usted tiene la responsabilidad de cumplir todas las leyes federales, estatales y locales, así como todas las reglamentaciones relativas a la utilización de pesticidas.
- Antes de utilizar un pesticida, asegúrese de que esté aprobado en su estado o localidad.
- Su estado o localidad puede exigir precauciones adicionales e instrucciones para la utilización de este producto que no están incluidas aquí.
- Monsanto no garantiza el lo completo ni la certeza de esta etiqueta de la espécimen. La información encontró en esta etiqueta puede diferir de la información encontró en la etiqueta del producto. Usted debe tener consigo la etiqueta aprobada por la agencia EPA cuando utilice el producto y debe leer y respetar todas las instrucciones en la etiqueta.
- No debe basarse sobre las precauciones, las instrucciones de utilización y cualquier otra información en esta etiqueta para utilizar algún otro producto similar.
- Siempre siga las precauciones y las instrucciones para el uso en la etiqueta del pesticida que usted utiliza.



Instrucciones de uso en medios acuáticos y otros sitios no dedicados a cultivos.

Registro en la EPA N° 524-343

EVITE EL CONTACTO DEL HERBICIDA CON EL FOLLAJE, TALLOS VERDES, RAICES NO LEÑOSAS EXPUESTAS O FRUTOS EXPUESTOS DE LAS COSECHAS, PLANTAS Y ARBOLES DESEABLES. EN CASO CONTRARIO ES PROBABLE QUE SUFRAN GRAVES DAÑOS O SEAN DESTRUIDOS TOTALMENTE.

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Antes de usar este producto, lea la etiqueta en su totalidad.

Uselo solamente de acuerdo con las instrucciones de la etiqueta.

No todos los productos recomendados en esta etiqueta han sido registrados para su uso en California. Verifique el estado de registro de cada producto en California antes de utilizarlo.

Antes de comprar o usar el producto, lea "LÍMITES EN LA GARANTÍA Y EN LA RESPONSABILIDAD" en la última sección de la etiqueta. Si las condiciones son inaceptables para usted, devuelva el producto inmediatamente sin abrir el recipiente.

ESTE ES UN PRODUCTO PARA USARSE TAL Y COMO ESTA PREPARADO. MONSANTO NO LO HA DISEÑADO NI LO HA REGISTRADO PARA QUE SEA REFORMULADO O LA VOLVER A EMPAQUETAR. VEA LA ETIQUETA DEL ENVASE INDIVIDUAL PARA ENTERARSE DE LAS LIMITACIONES DE REEMPAQUE.

1.0 INGREDIENTES

INGREDIENTE ACTIVO:

*Glifosato, N-(fosfonometil)glicina, en forma de su sal de isopropilamina53.8%

OTROS INGREDIENTES:.....46.2%
100.0%

*Contiene 648 gramos por litro o 5.4 libras por galón americano del ingrediente activo glifosato, en forma de su sal de isopropilamina. Equivalente a 480 gramos por litro o 4.0 libras por galón americano del ácido, glifosato.

No se han otorgado licencias bajo ninguna patente que no sea de los Estados Unidos.

2.0 TELEFONOS IMPORTANTES

1. PARA INFORMACION SOBRE EL PRODUCTO O AYUDA PARA UTILIZAR ESTE PRODUCTO, LLAME GRATIS AL
1-800-332-3111.
2. EN CASO DE QUE SE PRESENTE UNA EMERGENCIA RELACIONADA CON ESTE PRODUCTO, O PARA OBTENER AYUDA MEDICA, LLAME POR COBRAR A CUALQUIER HORA DEL DIA O DE LA NOCHE, AL TELEFONO.

(314)-694-4000.

3.0 ADVERTENCIAS

3.1 Riesgos para seres humanos y animales domésticos

Manténgase fuera del alcance de los niños.

¡PRECAUCIÓN!

Quítese la ropa contaminada y lávela antes de volver a usarla.

Después de manipular este producto, lávese bien con agua y jabón.

3.2 Riesgos al medio ambiente

No contamine el agua cuando lave los equipos ni cuando elimine las aguas de lavado de los mismos. El tratamiento de malezas acuáticas podría provocar el agotamiento del oxígeno debido a su consumo durante la descomposición de las plantas muertas. Esta pérdida del oxígeno podría provocar, a su vez, la asfixia de los peces.

En caso de DERRAME o FUGA de este producto, recójalo con materiales absorbentes y envíe los residuos a un vertedero.

3.3 Riesgos de orden físico o químico

Para mezclar, almacenar y aplicar la solución de este producto, se deben usar solamente recipientes de acero inoxi-dable, aluminio, fibra de vidrio, plástico o recipientes de acero recubiertos internamente con plástico.

NO MEZCLE, ALMACENE O APLIQUE ESTE PRODUCTO O SUS SOLUCIONES PARA ROCIAR EN RECIPIENTES O TANQUES ROCIADORES DE ACERO GALVANIZADO O DE ACERO NO RECUBIERTO (EXCEPTO SI ES ACERO INOXIDABLE). Este producto o la solución para rociar reaccionan con el material de dichos recipientes y tanques, lo cual produce hidrógeno, que puede formar una mezcla de gases altamente combustibles. Si esta mezcla de gases entra en contacto con llamas, chispas, el soplete de un soldador, un cigarrillo encendido o cualquier otra fuente de encendido, puede inflamarse o explotar y causar heridas graves a personas.

INSTRUCCIONES PARA EL USO

El uso de este producto de cualquier manera que sea inconsistente con las instrucciones dadas en la etiqueta es una violación de las leyes federales. Este producto sólo puede utilizarse de acuerdo a las indicaciones sobre el modo de empleo que figuran en esta etiqueta o en la etiqueta adicional de Monsanto impresa por separado. Para verificar requisitos específicos de su tribu o estado, consulte con la agencia responsable de la regulación del uso de pesticidas.

4.0 ALMACENAMIENTO Y DESECHO

Cuando almacene o deseche el producto no contamine el agua, los productos alimenticios, el alimento para animales o las semillas.

Mantenga los recipientes bien cerrados para evitar derramamientos y contaminación.

ALMACENAMIENTO DE PESTICIDAS: ALMACENE POR ENCIMA DE 5°F (-15°C) PARA EVITAR QUE EL PRODUCTO SE CRISTALICE. Los cristales se depositarán en el fondo. Si se permite la cristalización, coloque en un ambiente cálido a 68°F (20°C) durante varios días para que vuelva a disolverse y haga rodar el recipiente de agitación o recicle en recipientes de granel mínimo para mezclar bien antes de usar.

DESECHO DE PESTICIDAS: Los desechos que resulten del uso de este producto que no puedan utilizarse o reprocesarse químicamente deben eliminarse en un vertedero de basura aprobado para la eliminación de

pesticidas o de acuerdo con los procedimientos locales, estatales y federales aplicables.

ENVASE DE PESTICIDA: El recipiente vacío retiene vapores y residuos del producto. Observe todas las precauciones de la etiqueta hasta que el recipiente esté limpio, reacondicionado, o destruido.

PARA RECIPIENTES Y BOTELLAS PLÁSTICAS DE UNA VÍA: No reutilice el recipiente. Enjuague tres veces el recipiente, luego perforélo y deséchelo en un vertedero de basura sanitario o por incineración, ó, si lo permiten las autoridades estatales y locales, quemándolos. Si se queman, permanezca lejos del humo.

PARA CONTENEDORES TAMBORES DE UNA SOLA DIRECCIÓN: No reutilice el recipiente. Devuelva el recipiente según el programa de devolución de recipientes de Monsanto. Si no se devuelve, enjuague el recipiente tres veces, luego perforélo y deséchelo en un vertedero de basura sanitario, o por incineración, ó, si lo permiten las autoridades estatales y locales, quemándolos. Si se queman, permanezca lejos del humo.

PARA RECIPIENTES RECARGABLES PORTÁTILES (MINIGRANEL): Este recipiente se debe recargar sólo con productos pesticidas. No vuelva a utilizar este recipiente para ningún otro propósito.

El desecho final debe efectuarse conforme a las reglamentaciones estatales y locales. Si no recarga, devuelve o recicla el recipiente, enjuáguelo tres veces o a presión, perforélo y deséchelo en un vertedero sanitario, incinerándolo o bien, si las autoridades del estado y la localidad lo permiten, quemándolo. En caso de quemarlo, manténgase lejos del humo.

No lo transporte si el recipiente está dañado o escapando. Si el recipiente está dañado, escapando o es obsoleto, o bien, si desea informarse sobre cómo reciclar envases recargables portátiles, comuníquese con Monsanto Company al 800-768-6387.

Usuarios: Cuando el recipiente esté vacío, vuelva a taparlo y selle todas las aberturas practicadas cuando lo usó y luego, regréselo al lugar donde lo compró o a un lugar alternativo designado por el fabricante cuando se compró este producto. Si no lo regresa, enjuague el recipiente vacío tres veces o a presión y ofrézcalo para ser reciclado, si este servicio está disponible.

Recargadores: No vuelva a utilizar este recipiente para minigranel salvo para recargarlo conforme a un Acuerdo válido con Monsanto de Reenvasado o Reenvasado con cargo. Antes de recargar el recipiente, inspecciónelo cuidadosamente para asegurarse de que no presente rajaduras, pinchaduras, abrasión o roscas y dispositivos de cierre desgastados. Verifique si hay fugas después de recargarlo y antes de transportarlo.

PARA RECIPIENTES RECARGABLES FIJOS A GRANEL: Este recipiente se debe recargar sólo con productos pesticidas. **No vuelva a utilizar este recipiente para ningún otro propósito.**

Antes de recargar el recipiente, inspecciónelo cuidadosamente para asegurarse de que no presente rajaduras, pinchaduras, abrasión o roscas y dispositivos de cierre desgastados.

El desecho final debe efectuarse conforme a las reglamentaciones estatales y locales. Si no recarga el recipiente, enjuáguelo tres veces o a presión y ofrézcalo para ser reciclado o reacondicionado, si esto es posible. En caso de quemarlo, manténgase lejos del humo.

5.0 INFORMACION GENERAL

(Cómo funciona este producto)

Descripción del producto: Este producto es un herbicida sistémico de aplicación post-emergencia foliar, sin actividad residual en la tierra. Controla un amplio espectro de malezas anuales, malezas perennes, matorrales leñosos y árboles.

Aparición de los síntomas: Este producto se mueve dentro de la planta desde el punto de aplicación sobre el follaje, hasta las raíces. Los efectos visibles en la mayor parte de las malezas anuales se pueden apreciar entre los 2 ó 4 días después de la aplicación, pero en la mayoría de las malezas perennes, los efectos no se ven hasta después de 7 días o más. El frío extremo o el cielo muy nublado después de la aplicación pueden retardar la actividad del producto y hacer que el efecto visual se retarde. Los efectos visibles incluyen que la planta se marchite y se vuelva amarilla en forma gradual, hasta que la parte exterior de ésta se torne completamente color café; mientras tanto, las partes de la planta que están bajo tierra se deterioran completamente.

Modo de acción en las plantas: El ingrediente activo de este producto inhibe una enzima hallada sólo en las plantas y microorganismos que es esencial para la formación de aminoácidos específicos.

Prácticas culturales: Se podrá observar una reducción en el efecto si se aplica el producto a malezas anuales o perennes que hayan sido segadas, que hayan servido de alimento para animales o hayan sido cortadas, y que no hubiesen crecido nuevamente hasta el nivel recomendado para el tratamiento.

Resistencia a la lluvia: La lluvia torrencial poco después de la aplicación lavará el producto del follaje y se requerirá una nueva aplicación para obtener un control adecuado.

No tiene actividad residual sobre la tierra: En el momento de la aplicación, las malezas deben haber emergido para poder ser controladas por este producto. Las malezas que germinen a partir de semillas después de la aplicación no serán controladas. Las plantas de malezas perennes que no hayan emergido y se originen de rizomas o estolones subterráneos que no están unidos, no se verán afectadas por el herbicida y continuarán desarrollándose.

Mezclas de tanque: Este producto no proporciona control residual de malezas. Para lograr un control residual subsecuente, utilice un herbicida que la etiqueta esté aprobado. Lea y siga cuidadosamente todas las precauciones indicadas y toda la información que aparezca en las etiquetas de los herbicidas que use. Uselos según las instrucciones más restrictivas de la etiqueta de cada producto usado en la mezcla.

Cuando en las indicaciones incluidas en la etiqueta de este producto se recomiende una mezcla en tanque con un principio activo genérico como diuron, 2,4-D o dicamba, el usuario es responsable de asegurarse de que la indicación de uso en el rótulo de la mezcla del producto permita la aplicación específica.

El comprador y todos los usuarios son responsables por todas las pérdidas o daños que resulten del uso o manejo de las mezclas de este producto con herbicidas u otros materiales que no estén expresamente recomendados en este librito. La mezcla de este producto con herbicidas u otros materiales que no estén recomendados en este librito puede reducir la eficacia de este producto.

Proporción anual máxima de uso: El total combinado de todos los tratamientos no debe exceder 2 galones de producto por acre (18.7 L por hectárea) al año en zonas terrestres. Ninguna sola aplicación terrestre hecha sobre agua no debe exceder 7,5 pintas por acre (8.8 L por hectárea). Las proporciones máximas de uso especificadas en esta etiqueta de producto corresponden a este producto combinado con el uso de cualquier otro herbicida que contenga glifosfato o sulfosato como ingrediente activo, ya sea que se apliquen en forma de mezcla o por separado. Calcule las proporciones de aplicación y asegúrese de que el uso total de éste y otros productos que contienen glifosfato o sulfosato no exceda los límites máximos especificados.

ATENCION

EVITE EL CONTACTO DEL HERBICIDA CON EL FOLLAJE, TALLOS VERDES, RAICES NO LEÑOSAS EXPUESTAS O FRUTOS EXPUESTOS DE LAS COSECHAS, PLANTAS Y ARBOLES DESEABLES. EN CASO CONTRARIO ES PROBABLE QUE SUFRAN GRAVES DAÑOS O SEAN DESTRUIDOS TOTALMENTE.

EVITE EL ACARREO. CUANDO EL PRODUCTO SE APLIQUE, SE DEBE TENER MUCHO CUIDADO PARA PREVENIR EL DAÑO A PLANTAS Y CULTIVOS DESEABLES.

No permita que la solución del herbicida se nebulice, gotee, sea acarreada o salpique sobre la vegetación deseable. Una cantidad pequeña puede ser suficiente para causar daños graves o destruir las cosechas, plantas u otras áreas que no se desea tratar. La probabilidad de que ocurran daños por el uso de este producto aumenta cuando hay muchas ráfagas de viento, a medida que aumenta la velocidad del viento, cuando la velocidad del viento cambia constantemente o cuando existen otras condiciones meteorológicas que favorecen la dispersión del rociado. Cuando se esté aplicando el producto con un rociador, evite la combinación de presiones y tipos de boquilla que puedan dar como resultado salpicaduras o partículas finas (niebla), que tienen muchas probabilidades de que el producto sea acarreado. EVITE LA APLICACIÓN A ALTA VELOCIDAD O PRESIÓN EXCESIVAS.

NOTA: El uso de este producto de cualquier manera contraria a las indicaciones contenidas en este librito, puede resultar en lesiones a personas, animales o cosechas o pueden ocurrir otras consecuencias no deseadas.

6.0 MEZCLA

Limpie las piezas del rociador inmediatamente después de su utilización lavándolas bien con agua.

NOTA: PUEDE OCURRIR UNA DISMINUCION DE LOS RESULTADOS SI SE UTILIZA AGUA QUE CONTenga TIERRA, TAL COMO AGUA CON BARRO VISIBLE O AGUA DE CHARCAS O ACEQUIAS QUE NO ESTE CLARA.

6.1 Mezcla con agua

Este producto se mezcla fácilmente con agua. La solución para rociar se debe mezclar de la siguiente manera: ponga la cantidad correcta de agua en el tanque en el cual se va a preparar la mezcla. Agregue la cantidad recomendada de este producto cuando ya está cerca de completarse el llenado con agua y mezcle bien. Tenga cuidado de que el líquido no regrese al recipiente original. Use dispositivos aprobados para evitar que el líquido regrese al recipiente original cuando así lo exijan las reglamentaciones estatales o locales. Es posible que durante la mezcla y rociado, la solución produzca espuma. Para evitar o minimizar la formación de espuma, evite el uso de agitadores mecánicos, cierre las tuberías de derivación y de retorno en el fondo del tanque, y si es necesario, use

compuestos aprobados para evitar la formación de espuma o para eliminar la espuma ya formada.

6.2 Surfactante

Este producto requiere un surfactante no iónico. Al utilizar este producto, mezcle medio galón o más de surfactante no iónico por cada 100 galones de solución de rociado (0.5 litros o más por cada 100 litros). Si aumenta la proporción de surfactante podrá mejorar el rendimiento. Algunos casos en los que debe utilizarse una mayor proporción de surfactante son los siguientes: maleza leñosa, árboles y enredaderas difíciles de controlar, grandes volúmenes de agua, condiciones ambientales adversas, malezas resistentes al control, malezas que sufren estrés, surfactantes con menos de 70 por ciento de ingrediente activo, mezclas de tanque, etc. Estos surfactantes no deben utilizar en proporción mayor de 0.25 galones por acre (2.3 L por hectárea) al realizar aplicaciones difundidas.

Para obtener los mejores resultados, siempre lea y siga las recomendaciones en la etiqueta del fabricante del surfactante. Ponga especial atención a las advertencias y demás información que aparezca en la etiqueta del surfactante.

Este producto, si se aplica conforme a las recomendaciones y en las condiciones descritas, controla la maleza anual y perenne indicada en el folleto de la etiqueta. No reduzca las proporciones de este producto al añadir surfactante.

6.3 Procedimiento para mezclas de tanque

Mezcle las combinaciones para tanque de este producto con agua, como sigue:

1. Coloque una rejilla de malla 20 a 35 o un cesto de humectación sobre el orificio de llenado.
2. Llene el tanque de rociado hasta la mitad con agua a través de la rejilla y comience a agitar.
3. Si utiliza un polvo moible, forme un lodo con el agua y agréguelo LENTAMENTE al tanque a través de la rejilla. Siga agitando la mezcla.
4. Si utiliza una fórmula fluida, mezcle primero una parte de la fórmula fluida con una parte de agua. Agregue la mezcla diluida LENTAMENTE al tanque a través de la rejilla. Siga agitando la mezcla.
5. Si utiliza una fórmula concentrada emulsionante, mezcle primero una parte del concentrado emulsionante con dos partes de agua. Agregue la mezcla diluida lentamente al tanque a través de la rejilla. Siga agitando la mezcla.
6. Siga llenando el tanque de rociado con agua y agregue la cantidad requerida de este producto hacia el final del proceso de llenado.
7. Agregue el surfactante no iónico al tanque de rociado antes de terminar el proceso de llenado.
8. Agregue las fórmulas individuales al tanque de rociado como sigue: polvo moible, fórmula fluida, concentrado emulsionante, aditivo de control de deriva, líquido soluble en agua y surfactante no iónico.

Agite continuamente hasta usar totalmente el contenido del tanque. Si se deja que la mezcla para rociar se asiente, agite bien para que la mezcla vuelva a estar en suspensión antes de continuar con el rociado.

A fin de minimizar la formación de espuma, mantenga las tuberías de retorno lo más cerca del fondo del tanque. El tamaño del cernidor en la boquilla o de los cernidores en las tuberías no debe ser menor al número 50.

Siempre determine previamente la compatibilidad de la mezcla de este producto, que viene en tanque rotulado, con agua como vehículo, mezclando cantidades pequeñas proporcionales con anticipación. Asegúrese de que la mezcla en tanque específica esté registrada para su aplicación en el área deseada.

Vea la sección “**Mezclas de Tanque**” de “**INFORMACION GENERAL**” para las precauciones adicionales.

6.4 Mezcla de soluciones en porcentaje

Prepare la cantidad deseada de la solución para rociar, mezclando las proporciones de este producto con agua, según se muestra en la siguiente tabla:

Solución para rociar

VOLUMEN DESEADO	Cantidad de Herbicida AquaMaster					
	0.5%	0.75%	1%	1.5%	4%	8%
1 gal	2/3 oz	1 oz	1.3 oz	2 oz	5 oz	10 oz
25 gal	1 pt	1.5 pt	1 qt	1.5 qt	4 qt	2 gal
100 gal	2 qt	3 qt	1 gal	1.5 gal	4 gal	8 gal
2 cucharadas = 1 onza fluida						

Cuando se usen rociadores tipo mochila, o para bombeo, se recomienda que este producto se mezcle con agua en un recipiente grande. Llene el rociador con la solución ya lista.

6.5 Colorantes o tinturas

A este producto se le pueden agregar colorantes o tinturas para marcar, que sean aprobados para uso agrícola. Los colorantes o tinturas utilizados en las soluciones de rocío de este producto pueden reducir su rendimiento, especialmente a bajas concentraciones del producto o a bajas diluciones. Para usar los colorantes y tinturas siga las instrucciones del fabricante.

6.6 Aditivos de reducción de deriva

Puede utilizarse aditivos de reducción de deriva con todos los tipos de equipo, excepto aplicadores de enjugador y barras de esponja. Al utilizar un aditivo de reducción de deriva, lea detenidamente y siga al pie de la letra las advertencias y demás información que aparece en la etiqueta del aditivo. El uso de aditivos de reducción de deriva puede afectar la cobertura de rociado y reducir el rendimiento.

7.0 EQUIPOS Y TECNICAS PARA LA APLICACION

No use ningún sistema de irrigación para aplicar este producto.

APLIQUE ESTAS SOLUCIONES PARA ROCIAR UTILIZANDO EQUIPOS DEBIDAMENTE MANTENIDOS Y CALIBRADOS QUE SEAN CAPACES DE ROCIAR EL VOLUMEN DESEADO.

MANEJO DE LA DERIVA POR ROCIADO

EVITE LA DERIVA. DEBE USARSE EXTREMO CUIDADO EN LA APLICACIÓN DE ESTE PRODUCTO PARA EVITAR DAÑOS A PLANTAS Y CULTIVOS DESEADOS.

No permita que la solución del herbicida empañe, gotee, se derive o salpique sobre la vegetación deseada, ya que minúsculas cantidades de este producto pueden causar daños graves o destrucción del cultivo, plantas u otras áreas que no se pretendía tratar.

Es la responsabilidad del aplicador evitar la deriva por rociado en el lugar de aplicación. La interacción de varios factores relacionados con el clima y el equipo determina la posibilidad de deriva por rociado. El aplicador y el cultivador son responsables de considerar todos estos factores al tomar decisiones.

7.1 Equipo aéreo

NO APLIQUE ESTE PRODUCTO CON EQUIPOS AEREOS EXCEPTO BAJO LAS CONDICIONES QUE SE ESPECIFICAN EN ESTE LIBRETO.

PARA LA APLICACION AEREA EN CALIFORNIA, CONSULTE EL SUPLEMENTO FEDERAL PARA APLICACIONES AEREAS EN DICHO ESTADO, PARA CONOCER LAS INSTRUCCIONES, LIMITACIONES Y REQUISITOS ESPECIFICOS. Este producto más las mezclas en tanque de dicamba, Oust, y 2,4-D no se pueden aplicar por pulverización aérea en California. PARA EVITAR DAÑAR LA VEGETACIÓN DESEADA, SE DEBEN MANTENER ZONAS TAMPÓN ADECUADAS.

Evite la aplicación directa sobre agua.

Use las proporciones recomendadas de este producto con 3 a 25 galones de agua por acre.

Asegúrese de que la aplicación sea uniforme — A fin de evitar que queden áreas sin tratar, que la aplicación no sea uniforme o que las aplicaciones se traslapen, se deben usar marcadores adecuados.

MANEJO DE LA DERIVA POR ROCIADO AÉREO

Deben cumplirse los siguientes requisitos de control de deriva para evitar la deriva fuera del objetivo en las aplicaciones aéreas del producto a campos de cultivo. Estos requisitos no se aplican a usos de salud pública.

1. La distancia del pulverizador más externo en la barra distribuidora no debe exceder 3/4 del largo de la envergadura o rotor.
2. Los pulverizadores deben siempre apuntar hacia atrás, paralelos a la corriente de aire, nunca hacia abajo más de 45 grados. En los estados con reglamentos más estrictos, éstos deben observarse.

Importancia del tamaño de la gotita

La forma más eficaz de reducir la posibilidad de deriva es la aplicación de gotitas grandes. La mejor estrategia de manejo de la deriva es la aplicación de las gotitas más grandes que provean suficiente cobertura y control. La aplicación de gotitas más grandes reduce la posibilidad de deriva, pero no la evitará si las aplicaciones se realizan inadecuadamente o bajo condiciones ambientales desfavorables (vea las secciones de “**Viento**”, “**Temperatura y Humedad**”, e “**Inversión de la Temperatura**” en esta etiqueta).

Control del tamaño de la gotita

- **Volumen:** Use pulverizadores de velocidad de flujo alta para aplicar el mayor volumen de rociado práctico. Los pulverizadores con mayores velocidades de flujo producen gotitas más grandes.

- **Presión:** Use las presiones de rociado más bajas recomendadas para el pulverizador. La presión más alta reduce el tamaño de la gotita y no mejora la penetración del todo. Cuando sean necesarias velocidades de flujo mayores, use pulverizadores con velocidad de flujo mayor en lugar de aumentar la presión.
- **Número de pulverizadores:** Use el número mínimo de pulverizadores que provean cobertura uniforme.
- **Orientación del pulverizador:** Oriente los pulverizadores de modo que el rocío sea liberado hacia atrás, paralelo a la corriente de aire, produzca gotitas más grandes que en otras orientaciones. Una deflexión significativa de la horizontal reducirá el tamaño de la gotita y aumentará la posibilidad de deriva.
- **Tipo de pulverizador:** Use un tipo de pulverizador que esté diseñado para la aplicación prevista. Con la mayoría de los tipos de pulverizadores, los ángulos de rociado más angostos producen gotitas más grandes. Considere el uso de pulverizadores de deriva baja. Los pulverizadores de flujo sólido orientados hacia atrás producen gotitas más grandes que otros tipos de pulverizador.
- **Largo de la barra distribuidora:** Para algunos tipos de uso, la reducción del largo efectivo de la barra distribuidora a menos de 3/4 de la envergadura o el largo del rotor puede reducir más la deriva sin reducir el ancho de la hilera (pasada).
- **Altura de la aplicación:** Las aplicaciones no deben realizarse a una altura mayor que 10 pies por encima de la copa de las plantas más grandes, a menos que se requiera mayor altura por razones de seguridad del aeroplano. La realización de las aplicaciones a la menor altura que sea segura reduce la exposición de las gotitas a la evaporación y el viento.

Ajuste de la hilera (pasada)

Cuando las aplicaciones se lleven a cabo con viento lateral, la banda de aspersión se desplazará a favor del viento. Por ello, en los extremos con o contra el viento del campo, el aplicador debe compensar este desplazamiento ajustando la trayectoria del aeroplano contraria al viento. La distancia de ajuste de la hilera debe aumentar, cuando aumenta la posibilidad de deriva (mayor viento, gotitas más pequeñas, etc.).

Viento

La posibilidad de deriva es menor con velocidades del viento entre 2 y 10 mph. Sin embargo, muchos factores, incluyendo el tamaño de las gotitas y el tipo de equipo determinan la posibilidad de deriva a una velocidad determinada. Debe evitarse la aplicación menos de 2 mph debido a la dirección variable del viento y la posibilidad alta de inversión. **NOTA:** El terreno local puede influir en los patrones de viento. Cada aplicador debe conocer los patrones (vientos) locales y cómo éstos afectan la deriva.

Temperatura y humedad

Cuando se realizan aplicaciones con humedad relativa baja, fije el equipo para que produzca gotitas más grandes para compensar por la evaporación. La evaporación de gotitas es más grave cuando las condiciones son calurosas y secas.

Inversiones de temperatura

No deben realizarse aplicaciones durante una inversión de temperatura debido a que es alta la posibilidad de deriva. Las inversiones de temperatura restringen la mezcla de aire vertical, lo que causa que pequeñas gotitas suspendidas permanezcan en una nube concentrada. Esta nube puede moverse en direcciones no predecibles debido a los vientos variables leves que son comunes durante las inversiones. Las inversiones de temperatura están caracterizadas por temperaturas en aumento con altitud y son comunes en las noches con cobertura de nubes limitada y poco o ningún viento. Comienzan a formarse cuando se mete el sol y a menudo continúan en la mañana. Su presencia puede indicarse por neblina en el suelo; sin embargo, si la neblina no está presente, las inversiones también pueden identificarse por el movimiento del humo desde una fuente del suelo o por el generador de humo de un aeroplano. El humo en capas que se mueve lateralmente en una nube concentrada (bajo condiciones de poco viento) indica una inversión, mientras que el humo que se mueve hacia arriba y se disipa rápidamente indica buena mezcla de aire vertical.

Áreas sensibles

Este producto sólo se debe aplicar cuando la posibilidad de deriva hacia zonas adyacentes susceptibles (como por ejemplo, áreas residenciales, masas de agua, hábitat conocido de especies amenazadas o en peligro de extinción, cultivos que no sean el objetivo) sea mínima, (es decir, cuando el viento sople lejos de las áreas susceptibles).

Mantenimiento de aeronaves

EL CONTACTO PROLONGADO DE ESTE PRODUCTO CON PARTES DE ACERO QUE NO ESTÁ RECUBIERTO CON ALGUN TIPO DE PROTECCIÓN, PUEDE DAR COMO RESULTADO LA CORROSIÓN Y POSIBLEMENTE QUE LAS PARTES FALLEN. Es posible prevenir la corrosión recubriendo las partes con pintura orgánica, que cumpla con las especificaciones aeroespaciales MIL-C-38413. Al final de cada día de trabajo, para evitar la corrosión de las partes expuestas, lave muy bien el avión a fin de remover los residuos de este producto que se acumulan durante el rociado o por derramamientos. Las partes del tren de aterrizaje son extremadamente susceptibles.

7.2 Equipo de aplicación terrestre

Cuando se usa de acuerdo a las instrucciones de la etiqueta, este producto proporciona el control total o parcial de las malezas herbáceas, de los matorrales leñosos y de los árboles que se indican en la sección "MALEZAS CONTROLADAS" de esta etiqueta. Use las proporciones recomendadas de este producto con 3 a 40 galones de agua por acre para rociar de manera diseminada, a menos que se indique de otra manera en este libretto. A medida que la densidad de las malezas aumenta, el volumen de rociado se debe aumentar también para conseguir una cobertura completa, pero siempre dentro de los límites recomendados. A fin de evitar un rociado muy fino, seleccione la boquilla cuidadosamente. Para obtener mejores resultados con equipo a nivel del terreno, use boquillas tipo abanico plano. Asegúrese de que las gotas del rociado se distribuyan uniformemente.

7.3 Equipo de mano

Aplique el producto al follaje de la vegetación que se desea controlar. En aplicaciones de rociado para mojar, la cobertura del follaje debe ser completa y uniforme. No rocíe hasta el punto en que el producto gotee de la vegetación. Use rociadores gruesos solamente.

En el caso de aplicaciones de rociado directo de bajo volumen, utilice una solución de este producto al 4 u 8 por ciento para el control total o parcial de maleza anual, maleza perenne, arbustos leñosos o árboles. La cobertura de rociado debe ser uniforme y debe tener contacto con un 50 a 75 por ciento del follaje, como mínimo. Para obtener los mejores resultados es importante cubrir la mitad superior de la planta. Si emplea una boquilla de chorro recto, comience la aplicación del producto en la parte superior de la vegetación rocíe de arriba hacia abajo con movimientos laterales de barrido. Al utilizar boquillas con salida en forma de abanico o cono, o al usar nebulizadores de control manual, nebulice el producto al follaje de la vegetación. Para asegurar una cobertura adecuada, rocíe ambos lados de los árboles y los arbustos leñosos grandes o altos, si el follaje es denso o si hay varios retoños. Para obtener los mejores resultados, aplique el producto a los árboles y arbustos leñosos en crecimiento después de la expansión completa de las hojas y antes de que éstas tengan color otoñal y se caigan.

A menos que se especifique de otro modo, use las dosis recomendadas que se indican en el cuadro siguiente de "Dosis de Aplicación" para distintos métodos de aplicación foliar utilizando equipo de gran volumen, tipo mochila, y tipos similares de equipo manual. Cuando se usa de acuerdo a las instrucciones de la etiqueta, este producto proporciona el control total o parcial de las malezas herbáceas, los matorrales leñosos y los árboles que se indican en la sección "MALEZAS CONTROLADAS" de esta etiqueta.

DOSIS DE APLICACIÓN

APLICACIÓN	AQUAMASTER	VOLUMEN DE PULVERIZACIÓN GALONES POR ACRE
PULVERIZACIÓN PARA MOJAR		
Pistola manual, o tipo mochila	0.5 a 1.5% en peso	pulverización para mojar*
PULVERIZACIÓN DIRIGIDA DE BAJO VOLUMEN		
Tipo mochila	4 a 8% en peso	15 a 25**
Alto volumen modificado	1.5 a 3% en peso	40 a 60**

*En el caso de efectuar aplicaciones de pulverización para mojar, la cobertura debe ser uniforme y total. No pulverice hasta el punto de escurrimiento.

** Las aplicaciones dirigidas de bajo volumen con equipo tipo mochila dan mejor resultado cuando se tratan malezas y matorrales de menos de 10 pies de altura. En el caso de malezas y matorrales más altos, las pistolas de alto volumen se pueden modificar reduciendo el tamaño de la boquilla y la presión de pulverización para producir una pulverización dirigida de bajo volumen.

7.4 Equipo especializado

Este producto puede aplicarse mediante aplicadores con pantalla, rociadores con campana, aplicadores por frotación o barras de esponja, después de diluirse y mezclarse bien con agua, a la maleza especificada en esta etiqueta que crezca en sitios acuáticos o zonas que no sean de cultivo.

EVITE EL CONTACTO DEL HERBICIDA CON LA VEGETACIÓN DESEABLE YA QUE ES PROBABLE QUE SUFRA GRAVES DAÑOS O SEA DESTRUIDA TOTALMENTE.

Los aplicadores utilizados por encima de la vegetación deseable deben ser calibrados de tal manera que el rociado o el punto de contacto más bajo esté por lo menos a 2 pulgadas arriba de la vegetación deseable. Gotas, niebla, espuma o salpicaduras del herbicida en contacto con la vegetación deseable pueden causar con mucha probabilidad descoloración, atrofia o destrucción.

Se obtienen mejores resultados cuando una mayor cantidad de la maleza entra en contacto con el herbicida. Las malezas que no entran en contacto con la solución herbicida no serán afectadas. Esto puede ocurrir en lugares donde las malezas están muy concentradas, cuando la infestación es grave o donde la altura de las malezas es variada, lo que no permite que todas sean tocadas por el herbicida. En estos casos puede hacerse necesario repetir el tratamiento.

Aplicadores con pantalla y con capucha

Los rociadores con pantalla o con capucha aplican la solución del herbicida directamente sobre las malezas, al mismo tiempo que protegen la vegetación deseable, para que no sea tocada por el herbicida. Use boquillas que aseguren un recubrimiento uniforme en toda el área tratada. En los rociadores con pantalla, mantenga las pantallas debidamente colocadas a fin de proteger la vegetación que no se desee destruir. SE DEBE TENER MUCHO CUIDADO PARA EVITAR EL CONTACTO DEL HERBICIDA CON LA VEGETACION DESEABLE.

Aplicadores por frotación y barras de esponja

Los aplicadores por frotación son dispositivos que aplican cantidades adecuadas de este producto directamente sobre la maleza.

El equipo debe ser diseñado, mantenido y operado de manera que la solución del herbicida no haga contacto con la vegetación deseable. Opere este equipo a velocidades inferiores a las 5 millas por hora. En áreas donde la infestación es grave, se puede mejorar la eficacia reduciendo la velocidad, así se asegura que el frotador esté siempre adecuadamente saturado con la solución del herbicida. Se obtienen mejores resultados si se aplica dos veces en direcciones opuestas. Evite fugas o goteos sobre la vegetación deseable. Ajuste la altura de los aplicadores a fin de asegurar un contacto adecuado con las malezas. Mantenga limpias las superficies de frotación. Tenga presente que en terrenos inclinados, el herbicida puede migrar causando goteos en la parte baja y el secado de las mechas en la parte superior del aplicador por frotación.

No use aplicadores por frotación cuando las malezas estén mojadas.

Mezcle solamente la cantidad de solución que se usará durante el período de un día, debido a que el uso de sobras de días anteriores puede dar como resultado un efecto menos eficiente. Inmediatamente después de usar este producto, lave bien el aplicador usando bastante agua.

En todas las aplicaciones con enjugador se recomienda utilizar un surfactante no iónico en proporción del 10 por ciento por volumen de solución total de herbicida.

Para aplicadores de cordón o de mecha de esponja—Puede emplearse soluciones que oscilan entre 33 y 75 por ciento de este producto en agua.

Aplicadores de panel—En los aplicadores de enjugador de panel pueden utilizarse soluciones de un 33 a un 100 por ciento de producto en agua.

8.0 INSTRUCCIONES SEGUN AREAS Y USO

Salvo que se especifique lo contrario, pueden efectuarse aplicaciones para controlar cualquier tipo de maleza que se indique en las “**Maleza Anuales**”, “**Maleza Perenne**” o “**Arbustos Leñosos y Árboles**” mesas de tasa. Consulte también la sección “**Equipo Selectivo**”.

8.1 Sitios Acuáticos

Este producto puede aplicarse a las malezas brotadas en todo tipo de masa de agua (dulce o salobre), circulante o no. Esto incluye lagos, ríos, arroyos, estanques, estuarios, diques, manantiales, zanjas de drenaje e irrigación, canales, represas, plantas de tratamiento de aguas y sitios donde desea restaurarse el hábitat de la fauna local.

Este producto también puede usarse para controlar la maleza, arbustos leñosos y árboles indicados en la etiqueta que crezcan en zonas terrestres que no sean de cultivo o en áreas acuáticas de estas zonas.

Si hubiera sitios acuáticos próximos a las zonas no utilizadas para cultivo y que fueran parte del tratamiento a realizarse, lea y cumpla con las siguientes instrucciones:

Este producto no controla plantas que estén completamente sumergidas o que tengan la mayor parte de su follaje bajo agua.

No hay restricciones de ningún tipo en cuanto a la utilización del agua tratada en irrigación, actividades recreativas o uso doméstico.

Antes de aplicar este producto en aguas de uso público, consulte a los organismos estatales locales reguladores de caza y pesca, así como a las autoridades que controlan el uso del agua. Tal vez sea necesario contar con un permiso para tratar tales aguas.

NOTA: No aplique este producto **directamente al agua** dentro de 0.5 milla en contra de la corriente de una fuente activa de agua potable en agua que fluya (es decir, río, corriente, etc.) o dentro de la 0.5 milla de una fuente activa de agua potable en una extensión de agua estancada, tal como un lago, estanque o represa. Para poder efectuar aplicaciones sobre agua próxima o dentro de un radio de media milla de una toma activa de agua potable, la toma de agua deberá desactivarse durante un mínimo de 48 horas luego de la aplicación. La toma de agua puede abrirse antes de las 48 horas si el nivel de glifosato en la misma se encuentra por debajo de 0.7 partes por mil-

lón, determinado por un análisis de laboratorio. Estas aplicaciones sobre agua podrán efectuarse ÚNICAMENTE en caso de que exista una fuente de agua alternativa o lagunas de contención que permitan la desactivación temporal de la toma de agua durante un mínimo de 48 horas luego de la aplicación. Esta restricción **NO** se aplica al sobrerociado inadvertido intermitente de agua en sitios de uso terrestre.

Para tratamientos luego de un descenso del nivel de las aguas o en zanjas secas, después del tratamiento deje transcurrir 7 días o más antes de volver a llenar con agua. Así logrará el máximo control de las malezas. Aplique el herbicida de AquaMaster dentro de las 24 horas siguientes al descenso de las aguas, para asegurarse de que el producto está actuando sobre malezas en crecimiento activo.

Tal vez sea necesario volver a tratar la vegetación flotante. Evite que la vegetación a la que se le aplicó el producto, lo pierda por salpicaduras creadas por el bote utilizado para la aplicación o por otros botes que circulen en los alrededores. No efectúe ningún tratamiento si se esperan lluvias dentro de las 6 primeras horas posteriores a la aplicación. No vuelva a aplicar dentro de las 24 horas posteriores al tratamiento inicial.

La aplicación efectuada en las masas de agua en circulación debe realizarse desplazándose corriente arriba, para evitar que el herbicida se concentre en el agua. Cuando se lleve a cabo alguna aplicación en las orillas de un río o arroyo, no superponga las aplicaciones a más de 1 pie en el cauce del río o arroyo. No aplique sobre masas de agua donde no haya maleza. No supere la concentración máxima aplicable (7.5 pintas/acre) en ninguna aplicación diseminada que se efectúe sobre agua.

Cuando haya que tratar toda la superficie de una masa de agua no circulante, el tratamiento de ésta en franjas podría evitar el consumo total del oxígeno debido al proceso de degradación de la vegetación. Este agotamiento del oxígeno podría provocar la muerte de peces.

Mezclas Para Tanque

Pueden usarse mezclas para tanque de este producto con 2,4-D amina para aumentar el espectro de vegetación controlada en zonas acuáticas. Utilice de 1.5 a 2 pintas (0.7 a 0.95 L) de este producto más 2 a 4 pintas (0.95 a 1.9 L) de 2,4-D amina (4 libras de ingrediente activo por galón [480 mg por kg], rotulado para sitios acuáticos) para controlar maleza anual. Utilice de 3 a 7.5 pintas (1.4 a 3.5 L) de este producto más 2 a 4 cuartos de galón de 2,4-D amina (4 libras de ingrediente activo por galón [480 mg por kg], rotulado para sitios acuáticos) para el control total o parcial de maleza perenne, arborescentes y árboles.

Al mezclar en tanque, lea y siga al pie de la letra las reclamaciones, advertencias y demás información en las etiquetas de los productos utilizados. Use la mezcla conforme a las medidas precautorias más estrictas indicadas para cada producto en la mezcla. Mezcle en el siguiente orden: Llene el tanque de rociado a la mitad con agua, agregue el herbicida AquaMaster, luego 2,4-D amina y por último el surfactante. Llene el tanque de rociado con agua.

NOTA: NO MEZCLE EL HERBICIDA AQUAMASTER CON CONCENTRADOS DE 2,4-D AMINA SIN PORTADOR DE AGUA. NO MEZCLE EL HERBICIDA AQUAMASTER CON 2,4-D AMINA EN EQUIPO ROCIADOR CON INYECTOR DE DERIVACIÓN.

8.2 Troncos cortados

El tratamiento de troncos cortados puede hacerse en cualquier área indicada en esta etiqueta. Este producto controla muchas especies de matorrales leñosos y árboles. Aplique este producto usando equipo adecuado para garantizar la cobertura completa del cambium. Corte los árboles o sus brotes cerca de la superficie de la tierra. Aplique una solución de este producto del 50 al 100 por ciento a la superficie recién cortada, **inmediatamente después** del corte. Demorar la aplicación puede reducir la eficacia del producto. Para obtener mejores resultados, la aplicación deberá hacerse durante los períodos de crecimiento activo y expansión completa de las hojas.

Para controlar *Ailanthus altissima* (Tree-of-heaven) efectúe un tratamiento de tocón cortado de acuerdo con las instrucciones en esta sección utilizando una mezcla de rociado con 50 por ciento de herbicida AquaMaster y 10 por ciento de Arsenal.

NO HAGA LAS APLICACIONES SOBRE TRONCOS CORTADOS CUANDO LAS RAICES DE LOS MATORRALES LEÑOSOS O ARBOLES DESEABLES PUEDEN ESTAR INJERTADAS A LAS RAICES DE LOS TRONCOS CORTADOS. Algunos brotes, tallos o árboles pueden compartir el mismo sistema radicular. Árboles que están contiguos, que tienen la misma edad, altura y separación pueden indicar raíces compartidas. Cuando se trata de uno o más árboles que tienen raíces en común, tanto si están injertados como si comparten el sistema radicular, es probable que se produzca un daño en los brotes/árboles no tratados.

8.3 Áreas generales no cultivables y áreas industriales

Utilice en lugares como aeropuertos, complejos de apartamentos, zonas comerciales, bordes de acequias, entradas de autos, zanjas

secas, canales secos, hileras de cercas, canchas de golf, invernaderos, zonas industriales, depósitos de maderas, zonas de fabricación, solares municipales, zonas naturales, complejos de oficinas, cultivos ornamentales, estacionamientos, parques, pasturas, zonas con tanques de petróleo e instalaciones de bombeo, líneas de ferrocarril, praderas, zonas recreativas, zonas residenciales, derechos de paso, bordes de carreteras, escuelas, granjas de tepes o para semillas de césped, complejos deportivos, zonas de almacenamiento, subestaciones, zonas de servicios públicos, zonas de depósito, otros lugares públicos y zonas en las que se realiza gestión de vida silvestre.

Control general de malezas, recortado de bordes y suelo limpio de malezas

Este producto puede usarse en áreas generales no cultivables. Puede aplicarse con cualquiera de los equipos descritos en este libretto. Puede usarse para el recortado de bordes alrededor de objetos en áreas no cultivables, para tratamiento localizado de vegetación no deseable y para eliminar las malezas no deseables que crecen en cuadros de arbustos establecidos y plantaciones ornamentales. Este producto puede usarse antes de plantar un área con plantas ornamentales, flores, césped (tepes o semillas), o antes de colocar asfalto o de comenzar un proyecto de construcción.

Pueden hacerse aplicaciones repetidas de este producto, a medida que emergen las malezas, para mantener el suelo limpio de malezas.

MEZCLAS PARA TANQUE: Este producto se puede mezclar en tanque con los siguientes productos. Consulte los rótulos de estos productos para informarse sobre áreas no cultivables y dosis de aplicación.

Arsenal®	Outrider®
Barricade® 65WG	Pendulum® 3.3 EC
Certainty®	Pendulum WDG
diuron	Plateau®
Endurance®	Princep® DF
Escort®	Princip Liquid
Garlon® 3A	Ronstar® 50 WP
Garlon 4	Sahara®
Hyvar® X	simazine
Karmex® DF	Surflan®
Krovat® I DF	Telar®
Oust®	2,4-D

Este producto más las mezclas en tanque de dicamba, no se pueden aplicar por pulverización aérea en California.

Mezclas en tanque para el control de matorrales

MEZCLAS PARA TANQUE: Las mezclas en tanque de este producto se pueden usar para aumentar el espectro de control de las malezas herbáceas, matorrales leñosos y árboles. Cuando lleve a cabo una mezcla en tanque, lea y cumpla cuidadosamente con todas las recomendaciones y las precauciones que establece la etiqueta, así como también con toda la información incluida en las etiquetas de todos los productos que utilice. Use cada uno de los productos para la mezcla con la mayor de las precauciones. En una mezcla en tanque se puede usar cualquiera de las dosis recomendadas de este producto.

Para el control de malezas herbáceas, emplee las dosis recomendadas más bajas para mezcla en tanque. Para el control de herbaje tupido o de matorrales leñosos y árboles difíciles de controlar, emplee las dosis recomendadas más altas.

NOTA: En tratamientos de corte lateral, se recomienda que este producto se use solo o en mezcla en tanque con Garlon 4.

PRODUCTO	DOSIS POR DISEMINACIÓN
Arsenal	6 a 32 onzas fluidas por acre
Escort	1 a 2 onzas por acre
Garlon 3A*, Garlon 4	1 a 4 cuartos de galón por acre
PRODUCTO	DOSIS DE PULVERIZACIÓN PARA MOJAR
Arsenal	0.06 a 0.12% en volumen
Escort	1 a 2 onzas por acre
PRODUCTO	BAJO VOLUMEN DOSIS DE PULVERIZACIÓN DIRIGIDA
Arsenal	0.1 a 0.5% en volumen
Escort	1 a 2 onzas por acre

* Asegúrese de que Garlon 3A se mezcle bien con agua de acuerdo a las instrucciones de la etiqueta, antes de agregar este producto. Para evitar problemas de compatibilidad, agite la mezcla de pulverización en el momento en que se agregue este producto.

8.4 Manejo de hábitats

Restauración y mantenimiento de hábitats

Este producto puede ser usado para controlar la vegetación exótica y otras

plantas indeseables en áreas de manejo de hábitats y en áreas naturales, incluyendo áreas ribereñas y estuarinas, hábitats nativos y refugios para la fauna silvestre. Pueden hacerse aplicaciones para permitir la recuperación de las especies de plantas nativas, antes de plantar dichas especies nativas deseables, y para otros requisitos similares de control de la vegetación de amplia efectividad. A fin de eliminar selectivamente ciertas plantas indeseables, se pueden hacer aplicaciones localizadas para controlar y mejorar el hábitat.

Sitios donde se siembran alimentos para la fauna silvestre

Este producto puede ser usado para preparar el terreno donde se desea sembrar alimentos para la fauna silvestre. Cualquier especie de alimento para la fauna silvestre puede ser sembrada después de aplicar este producto, o también se puede permitir que las especies nativas vuelvan a poblar el área. Si hace falta labrar para preparar el terreno semillas, espere 7 días después de aplicar este producto antes de arar a fin de permitir la absorción adecuada en las partes de la planta que estén bajo tierra.

8.5 Inyección y chorro (matorrales leñosos y árboles)

Los matorrales leñosos y árboles pueden ser controlados aplicando este producto por inyección o chorro. Aplique este producto usando equipo adecuado, que debe ser capaz de penetrar en el tejido vivo. Aplique el equivalente a 1/25 onza fluida (1 ml) de este producto por cada 2 ó 3 pulgadas de diámetro del tronco a la altura del pecho (DBH en inglés). La mejor forma de hacerlo es aplicando una solución del 50 al 100 por ciento, este producto, con un chorro continuo alrededor del árbol o en cortes espaciados uniformemente alrededor del árbol y por debajo del nivel de las ramas. A medida que el diámetro del árbol aumenta, se obtienen mejores resultados con el chorro diluido continuo alrededor del árbol o en cortes espaciados muy cerca entre sí alrededor del árbol. Evite las aplicaciones que permiten el desagüe de material cuando se chorrea alrededor del árbol o sobre los cortes en árboles que tienen la facilidad de exudar savia de los cortes. En especies de este tipo, haga los cortes de manera oblicua a fin de producir el efecto de copa y use el producto sin diluir. Para obtener mejores resultados, la aplicación debe tener lugar durante períodos de crecimiento activo y expansión completa de las hojas.

8.6 Carreteras

Todas las instrucciones de la sección "Áreas Generales No Cultivables y Áreas Industriales" son válidas para las carreteras.

Tratamiento de bordes

Este producto puede ser usado en los bordes de las carreteras. Puede aplicarse con rociadores de aguilón, rociadores de aguilón con pantalla, boquillas descentradas de gran volumen, equipo de mano y equipos similares.

Barandas y otros obstáculos para la siega

Este producto puede ser usado para controlar las malezas que crecen debajo de las barandas y alrededor de los postes de señal y otros objetos en los bordes de las carreteras.

Tratamiento localizado

Este producto puede ser usado como tratamiento localizado para controlar la vegetación indeseable que crece a lo largo de los bordes de las carreteras.

MEZCLAS PARA TANQUE: Este producto puede mezclarse en tanque con los siguientes productos para tratamientos de bordes de carreteras, vallas de seguridad, zonas específicas y áreas sin vegetación, siempre y cuando el producto específico para la mezcla en tanque esté rotulado para el tipo de área:

diuron	Princep DF
Endurance	Princep Liquid
Escort	Ronstar 50 WP
Garlon 4	Sahara
Krovat I DF	simazine
Oust	Surflan
Outrider	Telar
Pendulum 3.3 EC	2,4-D
Pendulum WDG	

Vea las instrucciones generales para mezclas de tanque en la sección "MEZCLA" de este libretto.

Mantenimiento del Bermudagrass y Bahiagrass

Aplicaciones cuando estén latentes (durmientes)

Este producto puede usarse para controlar o controlar parcialmente muchas malezas anuales de invierno y tall fescue para el alivio eficaz de Bermudagrass y bahiagrass latentes. Trate solamente cuando el césped esté latente y antes de su reverdecer primaveral. Este producto también se puede mezclar en tanque con el herbicida Outrider o Oust para el control residual. Las mezclas de tanque de este producto con Oust pueden retrasar el reverdecer.

9.0 TIPOS DE MALEZAS CONTROLADAS

Use siempre la proporción más alta de este producto por acre, dentro de las proporciones recomendadas, cuando las malezas son densas o cuando crecen en un área no tocada (no cultivada).

Puede haber una disminución de los resultados cuando se traten malezas cubiertas con mucho polvo. Para las malezas que han sido segadas, pasadas o cortadas, permita que vuelvan a crecer antes del tratamiento.

Vea las secciones siguientes para las proporciones recomendadas para el control de malezas anuales y perennes, matorrales leñosos y árboles. Para las malezas, matorrales leñosos y árboles difíciles de controlar, donde las plantas crecen en condiciones de estrés, o donde la infestación es densa, pueden usarse 4.5 a 8 cuartos de galón por acre de este producto para obtener mejores resultados.

9.1 Malezas anuales

Aplique a las malezas anuales en crecimiento activo y de oja ancha.

Deje transcurrir al menos 3 días luego de la aplicación antes de hacer algo sobre la vegetación tratada. Después del lapso mencionado, podrá cortar, remover o quemar la maleza. En "INFORMACIÓN GENERAL", "MEZCLA", e "EQUIPOS Y TÉCNICAS PARA LA APLICACIÓN" encontrará instrucciones específicas relativas a la aplicación.

Use 1.5 pintas por acre si las malezas tienen menos de 6 pulgadas de altura o largo de los tallos y 1 cuarto a 4 cuartos de galón por acre si las malezas tienen más de 6 pulgadas de altura o largo de los tallos o cuando las malezas crecen en condiciones de estrés.

Para aplicaciones de rociado para mojar, aplique una solución de 0.5% de este producto a las malezas que tengan menos de 6 pulgadas de altura o largo de los tallos. Haga la aplicación antes de la formación de semillas para la hierba, o la formación de yemas para las malezas de hoja ancha. Para las malezas anuales que tienen más de 6 pulgadas de altura o las malezas más pequeñas que crecen en condiciones de estrés, use una solución del 0.75 al 1.5-por ciento. Use la dosis más alta para las especies difíciles de controlar o las malezas de más de 24 pulgadas de altura.

ESPECIES DE MALEZAS

Anoda, spurred	Hemp sesbania
Balsamapple**	Henbit
Barley*	Horseweed/Marestail
Barnyardgrass*	(<i>Conyza canadensis</i>)
Bittercress*	Itchgrass*
Black nightshade*	Johnsongrass, seedling
Bluegrass, annual*	Junglerice
Bluegrass, bulbous*	Knotweed
Bassia, fivehook	Kochia
Brome, downy*	Lamb's-quarters*
Brome, Japanese*	Little barley*
Broomsedge	London rocket*
Browntop panicum*	Mayweed
Buttercup*	Medusahead*
Carolina foxtail*	Morningglory
Carolina geranium	(<i>Ipomoea spp.</i>)
Castor bean	Mustard, blue*
Cheatgrass*	Mustard, tansy*
Cheeseweed	Mustard, tumble*
(<i>Malva parviflora</i>)	Mustard, wild*
Chervil*	Oats
Chickweed*	Pigweed*
Cocklebur*	Plains/Tickseed coreopsis*
Copperleaf, hophornbeam	Prickly lettuce*
Corn*	Puncturevine
Corn speedwell*	Purslane, common
Crabgrass*	Ragweed, common*
Dwarf dandelion*	Ragweed, giant
Eastern manna grass*	Red rice
Eclipta*	Russian thistle
Fall panicum*	Rye*
Falsedandelion*	Ryegrass*
Falseflax, smallseed*	Sandbur, field*
Fiddleneck	Shattercane*
Field pennycress*	Shepherd's-purse*
Filaree	Sicklepod
Fleabane, annual*	Signalgrass, broadleaf*
Fleabane, hairy	Smartweed, ladythumb*
(<i>Conyza bonariensis</i>)*	Smartweed, Pennsylvania*
Fleabane, rough*	Sowthistle, annual
Florida pusley	Spanishneedles***
Foxtail*	Speedwell, purslane*
Goatgrass, jointed*	Sprangletop*
Goosegrass	Spurge, annual
Grain sorghum (milo)*	Spurge, prostrate*
Groundsel, common*	Spurge, spotted*

Para obtener mejores resultados con malezas anuales de invierno, haga el tratamiento cuando las plantas estén en una etapa temprana de su crecimiento (menos de 6 pulgadas de altura) después de que la mayoría haya germinado. Para obtener mejores resultados con tall fescue, haga el tratamiento cuando el fescue esté en o después de su etapa de 4 a 6 hojas.

Aplique de 6 a 48 onzas fluidas de este producto en una mezcla de tanque con .075 a 1.33 de onza de herbicida Outrider por acre. Lea y siga todas las instrucciones de la etiqueta del herbicida Outrider.

MEZCLAS PARA TANQUE: Aplique de 6 a 48 onzas fluidas de este producto por acre, solo o en mezcla de tanque con 0.25 a 1 onza de Oust por acre. Aplique las proporciones recomendadas en 10 a 40 galones de agua por acre. Úselo solamente en áreas donde el Bermudagrass o bahiagrass son deseables y en las que puede tolerarse un poco de daño o decoloración. Para evitar que el reverdecer se retarde y para minimizar el daño, no agregue más de 1 onza de Oust por acre sobre Bermudagrass y no más de 0.5 onzas de Oust por acre sobre bahiagrass, y evite el tratamiento cuando estas hierbas se encuentren en estado semi-latente.

Bermudagrass que esté creciendo activamente

Este producto puede ser usado para controlar total o parcialmente muchas malezas anuales y perennes para el mantenimiento eficaz de Bermudagrass que esté creciendo activamente. Aplique de 12 a 36 onzas fluidas de este producto en 10 a 40 galones de solución para rociar por acre. Para tratar malezas anuales que tengan menos de 6 pulgadas de altura (o el largo de los tallos), use las proporciones más bajas. Use la proporción más alta a medida que las malezas aumenten de tamaño o cuando estén cerca de la floración o de la formación de semillas. Estas proporciones también controlan parcialmente las siguientes especies perennes:

Bahiagrass	Johnsongrass
Bluestem, silver	Trumpet creeper
Fescue, tall	Vaseygrass

Este producto se puede mezclar en tanque con el herbicida Outrider para el control o el control parcial de Sorghum halepense (Johnsongrass) y otras malas hierbas indicadas en la etiqueta del herbicida Outrider. Use de 6 a 24 onzas fluidas de este producto con 0.75 a 1.33 onzas de herbicida Outrider. Utilice las proporciones más altas de ambos productos para el control de malas hierbas perennes o anuales que tengan una altura superior a 6 pulgadas.

MEZCLAS PARA TANQUE: Este producto puede ser mezclado con Oust. Si se mezcla en tanques, no use más de 12 a 24 onzas fluidas de este producto con 1 a 2 onzas de Oust por acre. Para tratar malezas anuales indicadas en este librito y en el librito de Oust, que tengan menos de 6 pulgadas de altura (o el largo de los tallos), use las proporciones más bajas de cada producto. Use la proporción más alta a medida que las malezas aumenten de tamaño o cuando estén cerca de la floración o de la formación de semillas. Estas proporciones también controlan parcialmente las siguientes especies perennes:

Bahiagrass	Fescue, tall
Bluestem, silver	Johnsongrass
Broomsedge	Poorjoe
Dallisgrass	Trumpet creeper
Dock, curly	Vaseygrass
Dogfennel	Vervain, blue

Úselo solamente en Bermudagrass que esté bien establecido. Como resultado del tratamiento, el Bermudagrass puede sufrir deterioro, pero volverá a crecer si se riega. No se recomienda repetir el tratamiento con la mezcla de tanque en la misma estación, ya que esto puede ocasionar daños graves al Bermudagrass.

Bahiagrass que esté creciendo activamente

Para suprimir el crecimiento vegetativo y la inhibición de la formación de semillas de bahiagrass durante aproximadamente 45 días, aplique 4 onzas fluidas de este producto en 10 a 40 galones de agua por acre. Aplique de 1 a 2 semanas después de reverdecer completo o después de cortar a una altura uniforme de 3 a 4 pulgadas. Esta aplicación debe ser hecha antes de la emergencia de las semillas.

Para la supresión durante un máximo de 120 días, aplique 3 onzas fluidas de este producto por acre, y a continuación una aplicación de 2 a 3 onzas fluidas por acre unos 45 días más tarde. No haga más de 2 aplicaciones al año.

Este producto se puede utilizar para el control o el control parcial de Sorghum halepense (Johnsongrass) y otras malas hierbas indicadas en la etiqueta de Outrider, en Paspalum notatum (bahiagrass) en crecimiento activo. Aplique de 1.5 a 3.5 onzas fluidas de este producto con 0.75 a 1.33 onzas de herbicida Outrider por acre. Utilice las proporciones más altas para el control de malas hierbas perennes o anuales que tengan una altura superior a 6 pulgadas. Utilice sólo en Paspalum notatum (bahiagrass) bien establecido.

MEZCLAS PARA TANQUE: Puede usarse una mezcla de tanque de este producto con Oust. Aplique 4 onzas fluidas de este producto con 0.25 onzas de Oust por acre, 1 a 2 semanas después de la primera siega de la primavera. Haga solamente 1 aplicación al año.

ESPECIES DE MALEZAS

Spurry, umbrella*	Virginia copperleaf
Starthistle, yellow	Virginia pepperweed*
Stinkgrass*	Wheat*
Sunflower*	Wild oats*
Teaweed/Prickly sida	Witchgrass*
Texas panicum*	Woolly cupgrass*
Velvetleaf	Yellow rocket

*Cuando use equipos de aplicación diseminada a nivel del terreno (aplicaciones aéreas o rociadores de aguilón con boquillas tipo abanico plano), estas especies serán controladas o controladas parcialmente con 12 onzas fluidas de este producto por acre. Las aplicaciones deben hacerse usando de 3 a 10 galones de volumen por acre. Use boquillas que garanticen una cobertura completa del follaje y haga el tratamiento cuando las malezas estén en su etapa temprana de crecimiento.

**Aplique únicamente con equipo de mano.

***Aplique 3 pintas de herbicida de AquaMaster por acre.

9.2 Malezas perennes

Los mejores resultados se obtienen cuando las malezas perennes son tratadas una vez que han alcanzado la etapa reproductiva de su crecimiento (inicio de las semillas para hierbas y formación de yemas para malezas de hoja ancha). Para las plantas sin flores, los mejores resultados se obtienen cuando las plantas alcanzan el estado de madurez. En muchos casos, se requiere el tratamiento antes de estas etapas del crecimiento. En estos casos, use la proporción más alta dentro de las proporciones recomendadas.

Asegúrese de que la cobertura sea a fondo cuando emplee tratamientos de rociado para mojar con equipo de mano. Cuando se utilice equipo manual para tratamientos puntuales localizados de bajo volumen, aplique una solución de 4- a 8- por ciento de este producto.

Espere 7 días o más después de la aplicación antes de labrar. Si la maleza ha sido podada o labrada, no aplique el tratamiento hasta que la maleza haya crecido a la etapa recomendada. Los tratamientos otoñales deben aplicarse antes de las heladas.

Para controlar malezas que surjan de semillas o partes bajo tierra, deberá repetirse el tratamiento.

Especies de malezas	Proporción (cuartos por acre)	% de solución de mano
Alfalfa*	0.7	1.5
Alligatorweed*	3.0	1.3
Anise (fennel)	1.5 - 3.0	1.0 - 1.5
Bahiagrass	2.3 - 3.75	1.5
Beachgrass, European (<i>Ammophila arenaria</i>)	—	3.5
Bentgrass*	1.0	1.5
Bermudagrass	4.0	1.5
Bermudagrass, water (knotgrass)	1.0	1.5
Bindweed, field	3.0 - 3.75	1.5
Bluegrass, Kentucky	1.5 - 2.3	0.75
Blueweed, Texas	3.0 - 3.75	1.5
Brackenfern	2.3 - 3.0	0.75 - 1.0
Bromegrass, smooth	1.5 - 2.3	0.75
Bursage, woolly-leaf	—	1.5
Canarygrass, reed	1.5 - 2.3	0.75
Cattail	2.3 - 3.75	0.75
Clover; red, white	2.3 - 3.75	1.5
Cogongrass	2.3 - 3.75	1.5
Cordgrass	2.3 - 3.75	1.0 - 2.0
Cutgrass, giant	3.0	1.0
Dallisgrass	2.3 - 3.75	1.5
Dandelion	2.3 - 3.75	1.5
Dock, curly	2.3 - 3.75	1.5
Dogbane, hemp	3.0	1.5
Fescue (except tall)	2.3 - 3.75	1.5
Fescue, tall	2.3	1.0
Guineagrass	2.3	0.75
Horsenettle	2.3 - 3.75	1.5
Horseradish	3.0	1.5
Iceplant	1.5	1.5
Ivy; German, cape	1.5 - 3.0	0.75 - 1.5
Jerusalem artichoke	2.3 - 3.75	1.5
Johnsongrass	1.5 - 2.3	0.75
Kikuyugrass	1.5 - 2.3	0.75
Knapweed	3.0	1.5
Lantana	—	0.75 - 1.0
Lespedeza	2.3 - 3.75	1.5
Loosestrife, purple	2.0	1.0 - 1.5
Lotus, American	2.0	0.75
Maidencane	3.0	0.75
Milkweed, common	2.3	1.5
Muhly, wirestem	1.5 - 2.3	0.75
Mullein, common	2.3 - 3.75	1.5

Especies de malezas	Proporción (cuartos por acre)	% de solución de mano
Napierrgrass	2.3 - 3.75	1.5
Nightshade, silverleaf	3.0 - 3.75	1.5
Nutsedge; purple, yellow	2.3	0.75
Orchardgrass	1.5 - 2.3	0.75
Pampasgrass	2.3 - 3.75	1.5
Paragrass	3.0	0.75
Pepperweed, perennial	3.0	1.5
Phragmites*	2.0 - 3.75	0.75 - 1.5
Poison hemlock	1.5 - 3.0	0.75 - 1.5
Quackgrass	1.5 - 2.3	0.75
Redvine*	1.5	1.5
Reed, giant (<i>Arundo donax</i>)	3.0 - 3.75	1.5
Ryegrass, perennial	1.5 - 2.3	0.75
Salvinia, (<i>spp.</i>)	—	2.0
Smartweed, swamp	2.3 - 3.75	1.5
Spatterdock	3.0	0.75
Spurge, leafy*	—	1.5
Starthistle, Yellow	—	1.5
Sweet potato, wild*	—	1.5
Thistle, artichoke	1.5 - 2.3	2.0
Thistle, Canada	1.5 - 2.3	1.5
Timothy	1.5 - 2.3	1.5
Torpedograss*	3.0 - 3.75	0.75 - 1.5
Trumpet creeper*	1.5 - 2.3	1.5
Tules, common	—	1.5
Vaseygrass	2.3 - 3.75	1.5
Velvetgrass	2.3 - 3.75	1.5
Waterhyacinth	2.5 - 3.0	0.75 - 1.0
Waterlettuce	—	0.75 - 1.0
Waterprimrose	—	0.75
Wheatgrass, western	1.5 - 2.3	0.75

*Control parcial

Alligatorweed (Alternanthera)—Aplique 6 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 1.3% con equipo de mano para lograr el control parcial de alligatorweed. Aplique cuando la mayoría de las plantas esté en floración. Para mantener el control, deberá repetirse la aplicación.

Beachgrass, European; Barrón o grama del norte (Ammophila arenaria)—Aplique una solución de este producto al 8 por ciento más un 0.5 a 1.5 por ciento de surfactante no iónico para rociado o aplicación mojada de bajo volumen. Se obtienen los mejores resultados al efectuar la aplicación cuando el barrón está saliendo de la bota para alcanzar las etapas de desarrollo completo. En el otoño, aplique el producto antes de que el número de hojas verdes se reduzca a menos del 50 por ciento. No aplique el tratamiento cuando la maleza esté afectada por sequía. Tal vez sea necesario repetir las aplicaciones.

Bermudagrass (Pasto Bermuda)—Aplique 7.5 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 1.5% con equipo de mano. Aplique cuando las plantas estén en pleno crecimiento y cuando aparezca la vaina de las semillas.

Bindweed, field / Silverleaf Nightshade (Hierba mora) / Texas Blueweed—Aplique 6 a 7.5 pintas de herbicida de AquaMaster por acre por aspersión diseminada al oeste del Río Mississippi y 4.5 a 6 pintas por acre al este de dicho río. Cuando utilice equipo de mano, use una solución al 1.5%. Aplique cuando las plantas estén en pleno crecimiento y estén floreciendo o ya hayan florecido. Para silverleaf nightshade, los mejores resultados se obtienen cuando la aplicación se realiza luego de formadas las bayas. No aplique cuando la maleza esté debilitada por sequía. El desarrollo de nuevas hojas indica que hay un crecimiento activo. Los mejores resultados se obtienen cuando se aplica a fines del verano o durante el otoño.

Brackenfern—Aplique 4.5 a 6 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 0.75-1% con equipo de mano. Aplique a las frondas crecidas que tengan al menos 18 pulgadas (45 cm) de longitud.

Cattail (Tifa)—Aplique 4.5 a 6 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 0.75% con equipo de mano. Aplique cuando las plantas estén en pleno crecimiento y cuando estén floreciendo o ya hayan florecido. Los mejores resultados se obtienen cuando se aplica en el verano o durante el otoño.

Cogongrass (Zacate Fucgo)—Aplique 4.5 a 7.5 pintas de herbicida de AquaMaster por acre por aspersión diseminada. Aplique cuando el cogongrass tengan al menos 18 pulgadas (45 cm) de altura y esté en pleno crecimiento a fines del verano o durante el otoño. Luego de la aplicación y antes de remover o cortar las plantas, deje transcurrir 7 días o más. Debido a las distintas etapas de crecimiento y a lo tupido de la vegetación, que impide realizar una cobertura homogénea, para mantener el control podría ser necesario efectuar repetidas aplicaciones.

Cordgrass (Espartina)—Aplique 4.5 a 7.5 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 1-2% con equipo de mano. Programe la aplicación de modo de que transcurran al menos 6 horas desde la aplicación hasta que las plantas tratadas sean cubiertas por la marea.

La presencia de escombros u otros restos sobre las plantas reducirá la efectividad del producto aplicado. Para mejorar la absorción del herbicida sobre las plantas, podría ser necesario lavar éstas antes de proceder a la aplicación.

Cutgrass, giant—Aplique 6 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 1% con equipo de mano para lograr el control parcial de cutgrass. Para mantener el control, deberá repetirse la aplicación, sobre todo en sitios donde la vegetación esté parcialmente sumergida en agua. Antes de repetir la aplicación, deje que las plantas vuelvan a crecer, hasta llegar a la etapa en que poseen 7 a 10 hojas.

Dogbane, hemp / Knapweed / Horseradish—Aplique 6 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 1.5% con equipo de mano. Aplique cuando las plantas estén en pleno crecimiento y cuando la mayoría de ellas haya llegado a la etapa de comienzo del florecimiento. Los mejores resultados se obtienen cuando se aplica a finales del verano o durante el otoño.

Fescue, tall—Aplique 4.5 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 1% con equipo de mano. Aplique cuando las plantas estén en pleno crecimiento y cuando la mayoría de ellas haya llegado a la etapa de floración. Cuando se aplica antes de floración, el control no resulta tan efectivo.

Guineagrass (Zacate guinea)—Aplique 4.5 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 0.75% con equipo de mano. Aplique cuando las plantas estén en pleno crecimiento y cuando la mayoría de ellas haya llegado a una etapa donde tenga al menos 7 hojas.

Johnsongrass (Zacate Johnson) / Bluegrass, Kentucky / Bromegrass, smooth / Canarygrass, reed / Orchardgrass / Ryegrass, perennial / Timothy / Wheatgrass, western—Aplique 3 a 4.5 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 0.75% con equipo de mano. Aplique cuando las plantas estén en pleno crecimiento y cuando la mayoría de ellas haya llegado a la etapa del comienzo de floración. Cuando se aplica antes del comienzo de floración, el control no resulta tan efectivo. En el otoño, aplique antes de que las plantas se tornen marrones.

Lantana—Aplique herbicida de AquaMaster como una solución al 0.75% a 1% con equipo de mano. Aplique a la lantana en crecimiento activo durante o luego del florecimiento. Si las plantas hubieran llegado a la etapa de crecimiento leñoso, utilice la concentración más alta.

Loosestrife, purple—Aplique 4 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 1-1.5% con equipo de mano. Aplique cuando las plantas estén en pleno crecimiento y cuando estén floreciendo o ya hayan florecido. Los mejores resultados se obtienen cuando se aplica en el verano o durante el otoño. El tratamiento en otoño debe efectuarse antes de que se produzcan heladas.

Lotus, American (Lirio)—Aplique 4 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 0.75% con equipo de mano. Aplique cuando las plantas estén en pleno crecimiento y cuando estén floreciendo o ya hayan florecido. Los mejores resultados se obtienen cuando se aplica en el verano o durante el otoño. El tratamiento en otoño debe efectuarse antes de que se produzcan heladas. Podría ser necesario repetir el tratamiento para controlar el crecimiento a partir de semillas o de partes enteras de la planta.

Maidencane / Paragrass (Pasto Pará)—Aplique 6 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 0.75% con equipo de mano. Podría ser necesario repetir la aplicación, sobre todo en sitios donde la vegetación esté parcialmente sumergida en agua. En estas condiciones, deje que las plantas vuelvan a crecer hasta que posean 7 a 10 hojas antes de repetir el tratamiento.

Milkweed, common—Aplique 4.5 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 1.5% con equipo de mano. Aplique cuando las plantas estén en pleno crecimiento y cuando la mayoría haya llegado a la etapa de pasaje de capullo a flor.

Nutsedge: purple, yellow (coquito, coyolito)—Aplique 4.5 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 0.75% con equipo de mano para controlar plantas de nutsedge existentes y los frutos inmaduros de éstas. Aplique cuando las plantas estén en flor o cuando se vean nuevos frutos en la punta de los rizomas. Los frutos que aún no hubieran germinado no serán controlados y podrían germinar luego del tratamiento. Para lograr un control a largo plazo, deberán repetirse los tratamientos.

Pampasgrass—Aplique herbicida de AquaMaster como una solución al 1.5% con equipo de mano cuando las plantas estén en crecimiento activo.

Phragmites—Para controlar parsialmente phragmites en Florida y en los condados de otros estados a orillas del Golfo de México, aplique 7.5 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 1.5% con equipo de mano. En otras áreas de los Estados Unidos, el control parcial se logra aplicando 4 a 6 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 0.75% con equipo de mano. Los mejores resultados se obtienen cuando se aplica a finales del verano o durante el otoño, cuando las plantas están creciendo activamente y en pleno florecimiento. Dada la densidad natural de esta vegetación, que podría dificultar una cobertura uniforme del follaje, así

como la existencia de plantas en distinto estado de crecimiento, podría ser necesario repetir los tratamientos para mantener el control. Los síntomas de control que se aprecian a simple vista podrían demorar en manifestarse.

Quackgrass / Kikuyugrass (Kikuyo) / Muhly, wirestem—Aplique 3 a 4.5 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 0.75% con equipo de mano cuando la mayoría de las plantas quackgrass y wirestem muhly tengan, como mínimo, 8 pulgadas (20 cm) de altura (3 a 4 hojas) y estén creciendo activamente. Luego de la aplicación y antes de remover las plantas, deje transcurrir 3 días o más.

Reed, giant (Carrizo) / Ice Plant—Aplique herbicida de AquaMaster como una solución al 1.5% con equipo de mano cuando las plantas estén en pleno crecimiento. Para giant reed, los mejores resultados se obtienen cuando se aplica a fines del verano o durante el otoño.

Spatterdock—Aplique 6 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 0.75% con equipo de mano. Aplique cuando la mayoría de las plantas estén floreciendo. Los mejores resultados se obtienen cuando se aplica en el verano o durante el otoño.

Sweet potato, wild (boniato/batata silvestre)—Aplique herbicida de AquaMaster como una solución al 1.5% con equipo de mano cuando las plantas estén en pleno crecimiento, durante o luego del florecimiento. Se necesitarán varias aplicaciones. Antes de repetir el tratamiento, deje que la planta llegue a la etapa de crecimiento recomendada.

Thistle (cardo): Canada, artichoke—Aplique 3 a 4.5 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 1.5% con equipo de mano para el cardo Canada. Para controlar cardo artichoke, aplique una solución al 2% de modo de mojar toda la superficie. Aplique cuando las plantas estén creciendo activamente y tengan capullos o hayan florecido.

Torpedograss—Aplique 6 a 7.5 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 0.75-1.5% con equipo de mano para lograr un control parcial. Use las concentraciones menores si aplica sobre tierra y las concentraciones mayores si aplica sobre plantas parcialmente sumergidas o flotantes. Para mantener el control, deberá repetir los tratamientos.

Tules, common—Aplique herbicida de AquaMaster como una solución al 1.5% con equipo de mano cuando las plantas estén creciendo activamente, durante o luego de la aparición de las vainas. Después de la aplicación, los síntomas del efecto demorarán en aparecer y tal vez no se aprecien hasta transcurridas 3 semanas o más.

Waterhyacinth (Jacinto de agua)—Aplique 5 a 6 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 0.75-1% con equipo de mano cuando las plantas estén creciendo activamente, durante o luego de las primeras etapas del florecimiento. Después de la aplicación, los síntomas del efecto demorarán 3 semanas o más en aparecer. La necrosis y total descomposición suele ocurrir dentro de los 60 a 90 días posteriores a la aplicación. Si desea que los efectos se aprecien más rápidamente, utilice las concentraciones más altas.

Waterlettuce (Lechuga de agua)—Para control, aplique herbicida de AquaMaster como una solución al 0.75-1% con equipo de mano cuando las plantas estén creciendo activamente. Use concentraciones mayores si el enmalezado fuera grave. Los mejores resultados se obtienen cuando la aplicación se realiza desde mediados de verano hasta el invierno. Si la aplicación se realizara en la primavera, tal vez deba repetirse el tratamiento.

Waterprimrose (Clauto)—Aplique herbicida de AquaMaster como una solución al 0.75% con equipo de mano cuando las plantas estén creciendo activamente, durante o luego de la etapa del florecimiento y antes de que ocurran los cambios de color típicos del otoño. El mejor control se logra cuando la cobertura es completa.

Otras malezas perennes mencionadas en esta etiqueta—Aplique 4.5 a 7.5 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 0.75-1.5% con equipo de mano, cuando las plantas estén creciendo activamente y la mayoría haya llegado a las primeras etapas de florecimiento.

9.3 Matorrales leñosos y árboles

Aplique este producto después de la formación completa de hojas, a menos que se indique de otra manera. Para las plantas más grandes y/o donde la densidad de la vegetación sea alta, use la proporción más alta. En las plantas enredaderas que han alcanzado el estado leñoso de crecimiento, use las proporciones más altas. Los mejores resultados se obtienen cuando se aplica a finales del verano o en el otoño, después de la formación de frutos.

En zonas áridas, se obtienen mejores resultados cuando se aplica en la primavera o a principios del verano cuando las especies que crecen como matorrales tienen alto contenido de humedad y florecen.

Cuando haga tratamientos de rociado para mojar con equipos de mano, asegúrese de que la cobertura sea total.

Cuando use equipos de mano para tratamientos localizados con rociado dirigido de poco volumen, aplique una solución del 4 al 8 por ciento de este producto.

Es posible que los síntomas no aparezcan antes de las heladas o del envejecimiento con tratamientos de otoño.

Permita que pasen 7 o más días después de la aplicación antes de labrar, segar o remover. Es posible que se necesite repetir el tratamiento para tratar plantas que emergen de partes enterradas o de semillas. Un poco de colorido otoñal es aceptable en plantas indeseables que pierden las hojas en el otoño, siempre y cuando no hayan sufrido mayor pérdida de hojas. Si la aplicación de otoño se realiza después de que hayan ocurrido heladas, es posible que se obtengan resultados deficientes.

Especies de malezas	Proporción (cuartos por acre)	% de solución de mano de rociado para mojar
Alder	2.3 - 3.0	0.75 - 1.2
Ash*	1.5 - 3.75	0.75 - 1.5
Aspen, quaking	1.5 - 2.3	0.75 - 1.2
Bearclover (Bearmat)*	1.5 - 3.75	0.75 - 1.5
Beech*	1.5 - 3.75	0.75 - 1.5
Birch	1.5	0.75
Blackberry	2.3 - 3.0	0.75 - 1.2
Blackgum	1.5 - 3.75	0.75 - 1.5
Bracken	1.5 - 3.75	0.75 - 1.5
Broom; French, Scotch	1.5 - 3.75	1.2 - 1.5
Buckwheat, California*	1.5 - 3.0	0.75 - 1.5
Cascara*	1.5 - 3.75	0.75 - 1.5
Castor bean	—	1.5
Catsclaw*	—	1.2 - 1.5
Ceanothus*	1.5 - 3.75	0.75 - 1.5
Chamise*	1.5 - 3.75	0.75
Cherry; bitter, black, pin	1.5 - 3.75	1.0 - 1.5
Cottonwood, eastern	1.5 - 3.75	0.75 - 1.5
Coyote brush	2.3 - 3.0	1.2 - 1.5
Cypress, swamp, bald	1.5 - 3.75	0.75 - 1.5
Deerweed	1.5 - 3.75	0.75 - 1.5
Dewberry	2.3 - 3.0	0.75 - 1.2
Dogwood*	3.0 - 3.75	1.0 - 2.0
Elderberry	1.5	0.75
Elm*	1.5 - 3.75	0.75 - 1.5
Eucalyptus	—	1.5
Gallberry	1.5 - 3.75	0.75 - 1.5
Gorse*	1.5 - 3.75	0.75 - 1.5
Hackberry, western	1.5 - 3.75	0.75 - 1.5
Hasardia*	1.5 - 3.0	0.75 - 1.5
Hawthorn	1.5 - 2.3	0.75 - 1.2
Hazel	1.5	0.75
Hickory*	3.0 - 3.75	1.0 - 2.0
Honeysuckle	2.3 - 3.0	0.75 - 1.2
Hornbeam, American*	1.5 - 3.75	0.75 - 1.5
Huckleberry	1.5 - 3.75	0.75 - 1.5
Knotweed, Japanese and Giant**	—	—
Kudzu	3.0	1.5
Locust, black*	1.5 - 3.0	0.75 - 1.5
Madrone resprouts*	—	1.5
Magnolia, sweetbay	1.5 - 3.75	0.75 - 1.5
Manzanita*	1.5 - 3.75	0.75 - 1.5
Maple, red	1.0 - 3.75	0.75 - 1.2
Maple, sugar	—	0.75 - 1.2
Maple, vine*	1.5 - 3.75	0.75 - 1.5
Monkey flower*	1.5 - 3.0	0.75 - 1.5
Oak; black, white*	1.5 - 3.0	0.75 - 1.5
Oak, northern pin	1.5 - 3.0	0.75 - 1.2
Oak, post	2.3 - 3.0	0.75 - 1.2
Oak, red	—	0.75 - 1.2
Oak, Scrub*	1.5 - 3.0	0.75 - 1.5
Oak, southern red	1.5 - 3.75	1.0 - 1.5
Orange, Osage	1.5 - 3.75	0.75 - 1.5
Peppertree, Brazilian (Florida holly)*	1.5 - 3.75	1.5
Persimmon*	1.5 - 3.75	0.75 - 1.5
Pine	1.5 - 3.75	0.75 - 1.5
Poison ivy	3.0 - 3.75	1.5
Poison oak	3.0 - 3.75	1.5
Poplar, yellow*	1.5 - 3.75	0.75 - 1.5
Prunus	1.5 - 3.75	1.0 - 1.5
Raspberry	2.3 - 3.0	0.75 - 1.2
Redbud, eastern	1.5 - 3.75	0.75 - 1.5
Redcedar, eastern	1.5 - 3.75	0.75 - 1.5
Rose, multiflora	1.5	0.75
Russian olive*	1.5 - 3.75	0.75 - 1.5
Sage, black	1.5 - 3.0	0.75
Sage, white*	1.5 - 3.0	0.75 - 1.5
Sage brush, California	1.5 - 3.0	0.75
Salmonberry	1.5	0.75
Saltbush	—	1.0
Saltcedar**	1.5 - 3.75	0.75 - 1.5
Sassafras*	1.5 - 3.75	0.75 - 1.5

Especies de malezas	Proporción (cuartos por acre)	% de solución de mano de rociado para mojar
Sea Myrtle	—	1.0
Sourwood*	1.5 - 3.75	0.75 - 1.5
Sumac; laurel, poison, smooth, sugarbush, winged*	1.5 - 3.0	0.75 - 1.5
Sweetgum	1.5 - 2.3	0.75 - 1.5
Swordfern*	1.5 - 3.75	0.75 - 1.5
Tallowtree, Chinese	—	0.75
Tan oak resprouts*	—	1.5
Thimbleberry	1.5	0.75
Tobacco, tree*	1.5 - 3.0	0.75 - 1.5
Toyon*	—	1.5
Trumpet creeper	1.5 - 2.3	0.75 - 1.2
Vine maple*	1.5 - 3.75	0.75 - 1.5
Virginia creeper	1.5 - 3.75	0.75 - 1.5
Waxmyrtle, southern*	1.5 - 3.75	1.5
Willow	2.3	0.75
Yerba Santa*	—	1.5

* Control parcial

** Consulte las instrucciones específicas más adelante

Alder (Aliso) / Blackberry (Zarza) / Dewberry (Zarza) / Honeysuckle (Madreselva) / Oak, post / Raspberry (Frambuesa)—Para control, aplique 4.5 a 6 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 0.75-1.2% con equipo de mano.

Aspen, quaking (Álamo) / Hawthorn (Espino) / Trumpet creeper (Trompeta)—Para control, aplique 3 a 4.5 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 0.75-1.2% con equipo de mano.

Birch (Abedul) / Elderberry (Saúco) / Hazel (Avellano) / Salmonberry / Thimbleberry—Para control, aplique 3 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 0.75% con equipo de mano.

Broom (Retama): French, Scotch—Para control, aplique una solución al 1.25-1.5% con equipo de mano.

Buckwheat, California (Alforfón) / Hasardia / Monkey flower / Tobacco, tree (Tobaco, árbol)—Para control parcial de estas especies, aplique una solución al 0.75-1.5% sobre las hojas mediante equipo de mano. Para lograr los mejores resultados es necesario cubrir completamente el follaje.

Castor bean (Semilla de ricino)—Para control, aplique una solución al 1.5 por ciento de este producto con equipo manual.

Catsclaw (Uña de gato)—Para control parcial, aplique una solución al 1.2-1.5% con equipo de mano, cuando al menos el 50% de las hojas nuevas esté totalmente desarrollado.

Cherry (Cerezo); bitter (Amargo), black (Negro), pin / Oak, southern red (Rojo del Sur) / Sweetgum (Liquidambar) / Prunus—Para control, aplique 3 a 7.5 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 1.0 -1.5% con equipo de mano.

Coyote brush—Para control, aplique una solución al 1.2-1.5% con equipo de mano, cuando al menos el 50% de las hojas nuevas esté totalmente desarrollado.

Dogwood / Hickory (Nogal)—Para control parcial, aplique herbicida de AquaMaster como una solución al 1-2% con equipo de mano o a razón de 6 a 7.5 pintas por acre por aspersión diseminada.

Eucalyptus, (Eucalipto) bluegum—Para controlar los nuevos brotes de eucaliptos, aplique herbicida de AquaMaster como una solución al 1.5% con equipo de mano cuando los brotes tengan 6 a 12 pies (1.8 a 3.6 m) de altura. Verifique que la cobertura sea completa. Aplique cuando las plantas estén creciendo activamente. Evite aplicar cuando las plantas estén debilitadas por sequía.

Knotweed; Japanese, Giant (Polygonum cuspidatum and P. sachalinense)—Polígono japonés o (Polygonum cuspidatum) y centinodia de Sakhaline (Polygonum sachalinense)

Inyección en el tallo. Aplique 0.18 onzas líquidas (5 mililitros) de este producto. Inyectado debajo del segundo nodo, que está encima de la tierra de cada tallo en el grupo. Utilice equipo apropiado que penetre en la región internodal.

Tallo cortado. Corte los tallos limpiamente justo debajo del segundo o tercer nodo sobre la superficie de la tierra. Aplique de inmediato 0.36 onzas líquidas (10 mL) de solución de este producto al 50 por ciento en el “pozo” o espacio internodal que queda. Asegure que se colecte y deseche todo el material superior de las plantas, para que no tenga contacto con tierra y se regeneren las plantas a partir de los bulbos germinantes. Se recomienda usar una barrera biológica, como cartón, madera terciada o plástico.

El total de los tratamientos combinados no debe exceder 2 galones por acre (18.7 L por hectárea). Con 5 mililitros por el tallo, 8 cuartos de galón pueden tratar acerca de 1500 tallos.

Kudzu (Kudzu)—Para control, aplique 6 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 1.5% con equipo de mano. Para mantener el control, las aplicaciones deberán repetirse.

Maple (Arce), red (rojo)—Para control, aplique una solución al 0.75-1.2% con equipo de mano cuando las hojas estén totalmente desarrolladas. Para control parcial, aplique 2 a 7.5 pintas de herbicida de AquaMaster por acre por aspersión diseminada.

Maple (Arce), sugar (azúcar) / Oak (Roble), northern pin (pino del norte), red (rojo)—Para control, aplique una solución al 0.75-1.2% con equipo de mano, cuando al menos el 50% de las hojas nuevas esté totalmente desarrollado.

Peppertree, Brazilian (Molle, Brasileiro) (holly, Florida) / Waxmyrtle, southern—Para control parcial, aplique una solución de herbicida de AquaMaster al 1.5% con equipo de mano.

Poison ivy (Hiedra venenosa) / Poison oak (Zumaque)—Para control, aplique 6 a 7.5 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 1.5% con equipo de mano. Para mantener el control, tal vez sea necesario repetir las aplicaciones. Los tratamientos en otoño deberán efectuarse antes de que las hojas pierdan su color verde.

Rose, multiflora (Rosa)—Para control, aplique 3 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 0.75% con equipo de mano. Los tratamientos deberán efectuarse antes de que las hojas se deterioren debido a insectos que se alimenten de ellas.

Sage, black / Sage brush, California / Chamise / Tallowtree, Chinese (Arbol de Melissa)—Para control de estas especies, aplique una solución al 0.75% sobre las hojas mediante equipo de mano. Para lograr los mejores resultados es necesario cubrir completamente el follaje.

Saltbush, Sea Myrtle—Para control, aplique una solución de herbicida de AquaMaster al 1% con equipo de mano.

Saltcedar (Pino salado)—Para lograr un control parcial, aplique una solución de este producto al 1 ó 2 por ciento con equipo manual, ó 6 a 7.5 pintas (6.9 a 8,6 L por hectárea) como rociado difundido. Para el control total, aplique una solución de este producto al 1 ó 2 por ciento mezclada con 0.25 por ciento de Arsenal, utilizando equipo manual. Para el control con aplicación difundida, aplique una mezcla en tanque de 3 pintas (1.5 L) de este producto con 1 pinta (0.5 L) de Arsenal a las planta de menos de 6 pies (180 cm) de altura. Para controlar pinos salados de más de 6 pies (180 cm) de altura mediante aplicaciones difundidas, aplique una mezcla en tanque de 6 pintas (2.8 L) de producto con 2 pintas (0.95 L) de Arsenal.

Willow (Sauce)—Para control, aplique 4.5 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 0.75% con equipo de mano.

Otros arbustos leñosos y árboles que figuran en esta etiqueta—Para control parcial, aplique 3 a 7.5 pintas de herbicida de AquaMaster por acre por aspersión diseminada o como una solución al 0.75 -1.5% con equipo de mano.

10.0 LIMITES EN LA GARANTIA Y EN LA RESPONSABILIDAD

Monsanto Compañía garantiza que este producto concuerda con la descripción química de la etiqueta y es razonablemente adecuado para los propósitos descritos en el librito titulado Instrucciones Completas para el Uso ("Instrucciones") cuando se usa de acuerdo con dichas Instrucciones y las condiciones que allí se detallan. NO SE HACE NINGUNA OTRA GARANTIA EXPRESA O IMPLICITA ACERCA DE LA IDONEIDAD PARA UN USO PARTICULAR O COMERCIALIZACIÓN. Esta garantía está sujeta también a las condiciones y limitaciones que aquí se indican.

El comprador y todos los usuarios deberán reportar con prontitud a esta Compañía acerca de cualquier reclamo que se base en un contrato, negligencia, estricta responsabilidad, y otros actos ilícitos.

En la medida que lo permita la ley, el comprador y todos los usuarios son responsables por todas las pérdidas o daños que resultasen por el uso o manipulación en condiciones que estén más allá del control de esta Compañía, incluyendo pero no limitándose a: incompatibilidad con productos que no sean los señalados en las Instrucciones, aplicación o contacto con vegetación que no se quiera destruir, condiciones climáticas inusuales, condiciones de clima que estén fuera de los límites que se consideran normales en el lugar de la aplicación y para el período de tiempo en el cual se aplica, así como condiciones de clima que estén fuera de los límites indicados en las Instrucciones, aplicaciones que no estén explícitamente aconsejadas en las Instrucciones, condiciones de humedad que estén fuera de los límites establecidos en las Instrucciones, o la presencia de productos en la tierra o sobre ella, en las plantas o en la vegetación que se está tratando, diferentes a los indicados en las Instrucciones.

Monsanto compañía no garantiza ninguno de los productos reformulados o reempacados de este producto, excepto de acuerdo a los requisitos de la administración de esta compañía y con el permiso escrito expreso de esta compañía.

LA ÚNICA Y EXCLUSIVA COMPENSACION AL USUARIO O COMPRADOR Y EL LIMITE DE RESPONSABILIDAD DE ESTA COMPAÑIA O DE CUALQUIER OTRO VENDEDOR POR CUALQUIER PERDIDA O POR TODAS LAS PERDIDAS, PERJUICIOS O DAÑOS QUE RESULTASEN DEL USO O MANEJO DE ESTE PRODUCTO (INCLUYENDO RECLAMOS QUE SE BASEN EN UN CONTRATO, NEGLIGENCIA, ESTRUCTA RESPONSABILIDAD Y OTROS ACTOS ILICITOS) SERA EL PRECIO PAGADO POR EL USUARIO O EL COMPRADOR POR LA CANTIDAD INVOLUCRADA DE ESTE PRODUCTO, O A ELECCION DE ESTA COMPAÑIA O DE OTRO VENDEDOR, EL REEMPLAZO DE DICHA CANTIDAD, O SI NO SE OBTUVO MEDIANTE COMPRA SE REEMPLAZARA DICHA CANTIDAD DEL PRODUCTO. EN NINGUN CASO ESTA COMPAÑIA U OTRO VENDEDOR SERAN RESPONSABLES POR DAÑOS INCIDENTALES, CONSECUENTES O ESPECIALES.

En el momento de abrir y usar el producto, se asume que el comprador y todos los usuarios han aceptado las condiciones de los LIMITES EN LA GARANTIA Y EN LA RESPONSABILIDAD que no pueden variar por medio de ningún acuerdo verbal o escrito. Si las condiciones son inaceptables, devuelva el producto inmediatamente sin abrir el recipiente.

AquaMaster, Certainty, Outrider, Monsanto y el Vine symbol, es una marca comercial de la empresa Monsanto Technology LLC.

Todas las otras marcas registradas son la propiedad de sus dueños respectivos.

Registro en la EPA N° 524-343

En caso de que se presente una emergencia relacionada con este producto, llame por cobrar a cualquier hora del día o de la noche, al teléfono (314)-694-4000.

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ST. LOUIS, MISSOURI, 63167 U.S.A.



Glyphosate

What is Glyphosate and how does it work?

Glyphosate is a broad spectrum (non-selective) systemic herbicide that is used for the control of floating leaved and emergent aquatic plants. It is sprayed onto the leaves of the targeted plants where it is absorbed and transported throughout the plant. Once inside the plant it disrupts an enzyme pathway, which inhibits the plants from producing the amino acids and proteins that it needs to grow. Glyphosate is relatively slow acting so it typically takes a few weeks for the treated plants to die.

What plants are controlled by Glyphosate?

There are more than 100 emergent, floating leaved, or marginal plants that can be controlled by Glyphosate. A list of commonly controlled plants includes

- Fragrant water lily
- Purple loosestrife
- Cattail
- Spatterdock
- Frogbit
- Reed canary grass
- Yellow Flag Iris
- Phragmites
- Watersheild

Is Glyphosate safe to use?

Glyphosate is one of the safest herbicides available, both for people and the environment. Extensive tests have been completed evaluating the acute and chronic toxicological effects for mammals, birds, amphibians, and fish. The LD50 (the amount of a chemical that kills half of a sample population) for rats is 5.6 g of Glyphosate per kilogram of body weight. This would be the equivalent of a 175 lb. person consuming nearly a pound. Glyphosate has been rated by the EPA to be practically non toxic to fish as well. In addition to the low toxicity of Glyphosate, it has also been shown not to pose any cancer risk, and chronic exposure is not shown to have detrimental effects. In addition to the minimal toxicity risks it poses to animals, Glyphosate adheres to soil and sediment particles where it is broken down rapidly by soil microbes so it is not believed to have long-term environmental side effects.

What use or timing restrictions are there for Glyphosate?

Glyphosate has no restrictions for swimming, fishing, or irrigation, and has no application timing restrictions. Used in an aquatic setting though, proper permits need to be obtained, and it can only be applied by a Washington state licensed applicator.

How Much Does Glyphosate Cost?

As with any aquatic herbicide costs are dependent on many factors such as the size of the area to be treated, boat access considerations, and travel time for the applicator. In general though a cost of about \$300 acre is a reasonable estimate for planning purposes.

Are there any downsides to using Glyphosate to remove water lilies?

Yes. Water lily roots hold a large amount of sediment. When the plants are killed and the roots begin to decay, the root structure and trapped sediment can float to the water surface (usually in the spring following treatment) and form dense “floating islands”. These floating islands are not only unsightly but can be more problematic for boat access than the living water lily plants. The floating islands can be removed by raking or harvesting equipment, but this is not without significant cost, or effort. Test-treating a few small areas in the season before implementing a large scale control effort is a good strategy to assess risks of “floating island” formation.

Some additional reading on Glyphosate:

National Pesticide Information Center Factsheets

<http://npic.orst.edu/factsheets/glyphogen.pdf>

<http://npic.orst.edu/factsheets/glyphotech.pdf>

Washington Department of Ecology Aquatic Herbicide Page

<http://www.ecy.wa.gov/programs/wq/plants/management/aqua028.html>

University of Florida Aquatic Plant Management website

<http://plants.ifas.ufl.edu/guide/sup3herb.html>

What is glyphosate?

Glyphosate is an herbicide. It is applied to the leaves of plants to kill both broadleaf plants and grasses. The sodium salt form of glyphosate is used to regulate plant growth and ripen fruit.

Glyphosate was first registered for use in the U.S. in 1993. Glyphosate is one of the most widely used herbicides in the United States. People apply it in agriculture and forestry, on lawns and gardens, and for weeds in industrial areas. Some products containing glyphosate control aquatic plants.



What are some products that contain glyphosate?

Glyphosate comes in many forms, including an acid and several salts. These can be either solids or an amber-colored liquid. There are over 750 products containing glyphosate for sale in the U.S.

Always follow label instructions and take steps to avoid exposure. If any exposures occur, be sure to follow the First Aid instructions on the product label carefully. For additional treatment advice, contact the Poison Control Center at 1-800-222-1222. If you wish to report a pesticide problem, please call 1-800-858-7378.

How does glyphosate work?

Glyphosate is a non-selective herbicide, meaning it will kill most plants. It prevents the plants from making certain proteins that are needed for plant growth. Glyphosate stops a specific enzyme pathway, the shikimic acid pathway. The shikimic acid pathway is found only in plants and some microorganisms.



How might I be exposed to glyphosate?

You can be exposed to glyphosate if you get it on your skin, in your eyes or breathe it in when you are using it. You might swallow some glyphosate if you eat or smoke after applying it without washing your hands first. You may also be exposed if you touch plants that are still wet with spray. Glyphosate isn't likely to vaporize after it is sprayed.

NPIC General Fact Sheets are designed to provide scientific information to the general public. This document is intended to promote informed decision-making. Please refer to the Technical Fact Sheet for more information.

GLYPHOSATE

GENERAL FACT SHEET

What are some symptoms from a brief exposure to glyphosate?

Pure glyphosate is low in toxicity, but products usually contain other ingredients that help the glyphosate get into the plants. The other ingredients in the product can make the product more toxic. Products containing glyphosate may cause eye or skin irritation. People who breathed in spray mist from products containing glyphosate felt irritation in their nose and throat. Swallowing products with glyphosate can cause increased saliva, burns in the mouth and throat, nausea, vomiting, and diarrhea.

Pets may be at risk if they touch or eat plants that are still wet with spray from products containing glyphosate. Animals exposed to products with glyphosate may drool, vomit, have diarrhea, lose their appetite, or seem sleepy.

What happens to glyphosate when it enters the body?

In humans, glyphosate does not easily pass through the skin. Glyphosate taken in through the skin or by mouth goes through the body in less than one day. Glyphosate leaves the body in urine and feces without being changed into another chemical.

Studies with rats showed that about one-third of a dose of glyphosate was absorbed by the rats' intestines. Half of the dose was found in the rats' stomachs and intestines 6 hours later, and all traces were gone within one week.



Is glyphosate likely to contribute to the development of cancer?

Animal studies have not shown evidence that glyphosate exposure is linked to cancer. Studies with people have also shown little evidence that exposure to glyphosate products is linked with cancer.

Has anyone studied non-cancer effects from long-term exposure to glyphosate?

Glyphosate exposure has not been linked to developmental or reproductive effects in rats except at very high doses that were repeated during pregnancy. These doses made the mother rats sick. The rat fetuses gained weight more slowly, and some fetuses had skeletal defects.

No information was found linking exposure to glyphosate with asthma or other diseases.

Are children more sensitive to glyphosate than adults?

There were no studies found showing that children are more sensitive to glyphosate than adults. While [children may be especially sensitive to pesticides compared to adults](#), there are currently no data showing that children have increased sensitivity specifically to glyphosate.

GLYPHOSATE

GENERAL FACT SHEET

What happens to glyphosate in the environment?

Glyphosate binds tightly to soil. It can persist in soil for up to 6 months depending on the climate and the type of soil it is in. Glyphosate is broken down by bacteria in the soil.

Glyphosate is not likely to get into groundwater because it binds tightly to soil. In one study, half the glyphosate in dead leaves broke down in 8 or 9 days. Another study found that some glyphosate was taken up by carrots and lettuce after the soil was treated with it.

Can glyphosate affect birds, fish, or other wildlife?

Pure glyphosate is low in toxicity to fish and wildlife, but some products containing glyphosate may be toxic because of the other ingredients in them. Glyphosate may affect fish and wildlife indirectly because killing the plants alters the animals' habitat.



Where can I get more information?

For more detailed information see the [Glyphosate Technical Fact Sheet](http://npic.orst.edu) or call the National Pesticide Information Center 7 days a week, between 6:30 AM and 4:30 PM Pacific Time (9:30 AM to 7:30 PM Eastern Time) at 1-800-858-7378 or visit us on the web at <http://npic.orst.edu>. NPIC provides objective, science-based answers to questions about pesticides.

Date Reviewed: September 2010

NPIC is a cooperative agreement between Oregon State University and the U.S. Environmental Protection Agency (U.S. EPA). Data in NPIC documents are from selected authoritative and peer-reviewed literature. The information in this publication does not in any way replace or supercede the restrictions, precautions, directions, or other information on the pesticide label or any other regulatory requirements, nor does it necessarily reflect the position of the U.S. EPA.

Appendix E

Letter from WDNR Natural Heritage Program



WASHINGTON STATE DEPARTMENT OF
Natural Resources
Peter Goldmark - Commissioner of Public Lands

Caring for
your natural resources
... now and forever

October 28, 2010

Neil Brauer
Herrera Environmental Consultants
1220 4th Ave E.
Olympia, WA 98506

SUBJECT: Lake Stevens IAVMP (T29N R06E S7, 8, 17, 18; T29N R05E S12, 13)

Hello Neil,

We've searched the Natural Heritage Information System for information on significant natural features in your project area. Currently, we have no records for rare plants or high quality native ecosystems at the specified project area.

The information provided by the Washington Natural Heritage Program is based solely on existing information in the database. In the absence of field inventories, we cannot state whether or not a given site contains high quality ecosystems or rare plant species; there may be significant natural features in your study areas of which we are not aware.

The Washington Natural Heritage Program is responsible for information on the states rare plants as well as high quality ecosystems. For information on animal species of concern, please contact Priority Habitats and Species, Washington Department of Fish and Wildlife, 600 Capitol Way N, Olympia WA 98501-1091, or by phone (360) 902-2543.

For more information on the Natural Heritage Program, please visit our website at http://www.dnr.wa.gov/ResearchScience/Topics/NaturalHeritage/Pages/amp_nh.aspx. Species lists and fact sheets, as well as rare plant survey guidelines are available for download from the site. For the self-service system, please follow the Reference Desk link to Location Search. To download our statewide dataset, please go to <http://fortress.wa.gov/dnr/app1/dataweb/dmmatrix.html>. Please feel free to email us at natural_heritage_program@dnr.wa.gov.

Sincerely,

Jasa Holt
Data Specialist





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LAKE STEVENS CITY COUNCIL
STAFF REPORT

Council Agenda Date: May 9, 2010

Subject: Lake Stevens Shoreline Master Program Update – Briefing (LS2009-11)

Contact Person/Department: Becky Ableman/Karen Watkins **Budget Impact:** Grant

RECOMMENDATION(S)/ACTION REQUESTED OF COUNCIL: No action at this time. Staff is continuing to brief the Council on the project. This will be a discussion of three items: Appendix B Critical Areas Regulations in Ecology's and Fish and Wildlife's comments, Ecology's checklist to date, and Shoreline Jurisdiction.

SUMMARY: The City received a two year, \$60,000, Shoreline Master Program Update grant from the Washington State Department of Ecology in 2009 to complete a comprehensive Shoreline Master Program update. The grant covers July 1, 2009 through June 30, 2011. The City hired Makers Architecture, Inc. and The Watershed Company to assist City Staff. A Shoreline Citizen Advisory Board was created to guide the consultants and staff through the process. As part of drafting of the required documents, four open houses were offered to solicit public comments.

DISCUSSION: The preliminary final Shoreline Master Program Update for review during the Local Adoption process was completed in April and is located on the City's webpage. Ecology has been reviewing the December 15 document and their comments are incorporated into the April version. This briefing will include the following:

- Recent Ecology's and Fish and Wildlife's Comments,
- The SMP Checklist to date, and
- Appendix B Critical Areas Regulations in Shoreline Jurisdiction.

Recent Ecology's and Fish & Wildlife's Comments (*Attachment 1*)

Ecology and Fish & Wildlife reviewed the December 15, 2010 version of the SMP and associated documents. They provided comments by email mostly about dock dimensions.

SMP Checklist To Date (*Attachment 2*)

Part of the SMP review process is a checklist created by Ecology that the City and Ecology fill in with their comments and how they addressed the other's comments. The checklist is passed back and forth with the documents. I've attached the most recent checklist dated December 15, 2010. This allows you to see how the SMP documents have changed throughout the process. Ecology provides a response on whether we are compliant with the SMP guidelines. If we are non-compliant, we have to address each of Ecology's comments and tell them how we addressed them. They then review our responses and provide additional comments or state it is compliant.

Appendix B Critical Areas Regulations in Shoreline Jurisdiction (*Attachment 3*)

Appendix B was created by taking the existing Critical Areas Regulations in Chapter 14.88 LSMC and making changes for compliance with the SMP guidelines. The attachment shows the revisions marks to allow you to see what was changed from the existing CAR to create Appendix B. The table of contents shows the sections that were removed in their entirety. The City is working with Ecology through their requested changes. Ecology has suggested the City to use the model regulations in their *Wetlands & CAO Updates: Guidance for Small Cities* (Western Washington Version) (*Attachment 4*).

The following is a summary of the major changes to Chapter 14.88 LSMC to create Appendix B:

1. In general, the Critical Areas Regulations in Chapter 14.88 of the Lake Stevens Municipal Code are used for critical areas in shoreline jurisdiction (Appendix B of the Shoreline Master Program. There are a few sections that cannot be used in shorelines and some changes requested by Ecology. These are described below.
2. The following sections of Chapter 14.88 LSMC are not allowed under the Shoreline Management Act and were not included in Appendix B of the Shoreline Master Program:
 - a. 14.88.230 Compliance
 - b. 14.88.235 Best Available Science
 - c. 14.88.250 Procedures
 - d. 14.88.310 Demonstration of Denial of All Reasonable Economic Use
 - e. 14.88.320 Allowance of Regulated Use in a Critical Area Where Denial of All Economic Use is Demonstrated
 - f. 14.88.330 Nonconforming Activities
 - g. 14.88.415 Species/Habitats of Local Importance
3. The following are general changes to Chapter 14.88 LSMC for the SMP critical areas appendix:
 - a. Referencing the critical areas regulations are for areas within shoreline jurisdiction
 - b. Referencing state shoreline codes
 - c. Decisions are by Shoreline Administrator rather than Planning and Community Development Director, although they are currently one and the same.
4. The following are specific changes to Chapter 14.88 LSMC per State law or Ecology requirements for the SMP critical areas appendix (citations are for Appendix B of the SMP):
 - a. Section 1.A(a) includes two additional steps in avoiding and minimizing impacts: (3) in rectifying impact with repair, rehabilitation or restoration and (6) Monitoring impact and projects and take corrective actions if necessary.
 - b. Section 2.B ensuring no net loss of critical area and functions and adding to regulated activities consistent with state regulations (discharges of stormwater and domestic, commercial or industrial wastewater; duration of inundation during flooding; other uses or development resulting in a significant ecological impact to wetlands, lakes or streams; activities reducing the functions of buffers.
 - c. Section 2.C referencing no net loss and that a Hydraulic Project Approval may be required before activity in the critical area. Also, emergency activities are for immediate risk of

- damage to a primary structure, not just private property per State law. Section 2.D defines critical areas for shorelines as fish and wildlife conservation areas, frequently flooded areas, geologically hazardous areas and associated wetlands.
- d. Section 2.E submittal requirements are per Chapter 7 of the SMP and no submittal requirements may be waived.
 - e. Section 2.G added avoiding the impact altogether as first option.
 - f. Section 2.H added the five years for monitoring is for emergent communities and ten years for scrub-shrub and forested communities.
 - g. Section 2.N added mitigation sites to streams and wetlands.
 - h. Section 2.P innovative development design may be requested under a shoreline variance process.
 - i. Section 3.D(e) buffering averaging is not allowed in shoreline areas.
 - j. Section 5.C added two new allowed activities: (c) no new development or lots that would cause risk from geological conditions or (d) no new development requiring structural shoreline stabilization unless no alternative location and still results in no net loss of ecological functions.
 - k. Section 5.F allows alterations requested through a shoreline variance process.
 - l. Section 6.A wetland classifications do not include estuarine wetlands (which there are none in Lake Stevens) and change reference for wetland delineations to be in accordance with the WAC.
 - m. Section 6.B was modified to reference the federal wetland delineation manual rather than the Washington State manual for consistency with the change in State regulations.
 - n. Section 6.D added note that the larger buffer is required to meet no net loss of habitat function and requires the shoreline variance process be used for wetland buffer width averaging, and that averaging ensures no net loss of habitat function.
 - o. Section 6.E requires mitigation as close to existing wetland as possible and a watershed plan be submitted if off-site mitigation is proposed. Also, changes in wetland replacement ratios require a shoreline variance.
5. The most significant change to Chapter 14.88 LSMC is the increase in wetland buffers in Section 6.D, which only regulates those wetlands within shoreline jurisdiction and will not affect other wetlands throughout the City. City Staff and Consultants negotiated with Ecology, but Ecology stood firm to meet the requirements of their Small Cities Study.

Table 6-1

Category	Sub-Category	HS 30-36	HS 21-29	HS <21
I	(High)Based on Total Score	(190)225	(95)165	(65)105
	(Low)Bogs	(125)225	(65)N/A	(45)N/A
	Forested	225	165	105
II	(High)	(190)225	(95)165	(65)105
	(Low)	(125)	(65)	(45)
III	(High)	N/A	(95)165	(50)105
	(Low)		(65)	(35)
IV	(High)	N/A	N/A	(35)40
	(Low)			(20)

APPLICABLE CITY POLICIES: The State requires all cities to update their Shoreline Master Programs (SMP) on a specific schedule. The City’s current SMP was adopted in 1974.

BUDGET IMPACT: The City received a two year, \$60,000 Shoreline Master Program Update grant from the Washington Department of Ecology for consultants. The grant does not include staff time.

ATTACHMENTS:

- Attachment 1 – Recent Ecology’s and Fish & Wildlife’s Comments
- Attachment 2 – SMP Checklist To Date
- Attachment 3 – Appendix B Critical Areas Regulations in Shoreline Jurisdiction
- Attachment 4 – Wetlands & CAO Updates: Guidance for Small Cities

From: [Burcar, Joe \(ECY\)](#)
To: [Karen E. Watkins](#); Jamie.Bails@dfw.wa.gov
Cc: [Anderson, Paul \(ECY NWRO SEA\)](#)
Subject: Pier-Dock comment - City of Lake Stevens draft SMP
Date: Wednesday, April 20, 2011 4:33:23 PM

Hi Karen,

I have finally made it through the revisions to the SMP and just need to touch base with Paul on the wetland amendments. I have responded/confirmed to all the City's responses under the previous "Non-Compliant" sections of the SMP-Checklist. I will get you a copy of this checklist after checking in with Paul. In the mean time, I wanted to forward to you and Jamie Bails (WDFW) my comments related to the Pier/Dock width exceptions in the current draft. I am anticipating that this will be the only unresolved (i.e. "non-compliant") issue in the updated SMP. As I mentioned to you, I have been in contact with WDFW (Jamie Bails) and have requested that they provide the City with comments related to the pier/dock provision. I have attempted to describe a SMA policy basis for removal of the Pier/Dock width exceptions, but will defer to WDFW for (technical) fisheries specific comment on the SMP provisions. I have also noted (below), a recommendation from the City's Inventory/Characterization to coordinate with WDFW on Pier/Dock standards to ensure consistency with WDFW restoration/protection priorities.

Here is our (Ecology's) comment related to Pier/Dock standards within the current draft SMP. This comment is the same language that you will see in the SMP-Checklist:

(Ecology 4/2011) "Exceptions" (4.C.3.c.21.b. [width] i.a.1) and 2) appear to allow the width of private overwater structure to be increased to 6-feet or 8-feet in width within the "nearshore" (first 30-feet seaward of the OHWM) for linear or entirely grated docks, or if an applicant agrees to plant two "significant trees" along their shoreline as mitigation for the increased dock width. It is not clear how the City would justify this exception as the need for the additional pier/dock width is not described. Piers/Docks are described within the City's SMP as necessary to provide "moorage" and access to water-dependent uses. The SMP-Guidelines (WAC 173-26-231.3.b) characterize Pier/Docks as a **Shoreline Modification**, which should be restricted to the minimum size necessary and *"designed and constructed to avoid or, if that is not possible, to minimize and mitigate the impacts to ecological functions"* (Ecology, 2011). Ecology has allowed other jurisdictions to incorporate limited (defined) administrative flexibility to Pier/Dock dimensional standards to accommodate disability (ADA) needs. However, based on a 2003 U.S Access Board publication titled "Accessible Boating Facilities", pier/dock with should be 5-feet to accommodated ADA access. Therefore, the City's undefined need for additional pier/dock width is not justified. Further, additional pier/dock width within "nearshore" areas is not consistent with **Protection of Ecological Functions** (WAC 173-26-201-2-c) or **Environmental Mitigation** (Mitigation Sequencing) requirements from the SMP Guidelines under WAC 173-26-201 (2) (e). Mitigation Sequencing requires that Master programs first avoid impacts, then for those impacts that cannot be avoided, jurisdictions are to minimize impacts, finally remaining impacts which could not be avoided, or minimized, can be mitigate as the third step in the sequence (Ecology, 2011). As noted within the City's Shoreline Inventory/Characterization Report (Watershed & Makers, 2010a), the City's Cumulative Impact Assessment (Watershed & Makers, 2010b) and the Snohomish Basin Salmon

Conservation Plan (SBSRF, 2005) existing habitat should be protected or restored through reduction of overwater cover and in-water structure. The Shoreline Inventory/Characterization Report (Watershed & Makers, 2010a; 47) recommends that SMP Pier/Dock standards provide clear **“replacement”** and **“repair”** definitions and standards consistent with the SMP-Guideline section WAC 173-26-231-3b(below) and *“...clear dimensional standards for new piers and replacement/modified piers”*, that are consistent with Washington Department of Fish & Wildlife (WDFW) practices on the lake. The City’s Cumulative Impact Assessment (Watershed & Makers, 2010b) cites adverse affects to shoreline ecological functions associated with Pier/Dock construction and concludes that the SMP will satisfy No Net Loss of Ecological Functions based on the assumption that ecological improvements (grating, reduction of overwater and in-water structure) from replacement docks, will in the long-term offset increased overwater coverage resulting from new docks. Finally, Ecology is not aware of any formal coordination between the City and WDFW related to pier/dock standards or mitigation priorities. Based on the information provided within the City’s supporting analysis (Inventory/Characterization, Cumulative Impact Assessment), it appears that the nearshore area (30-feet waterward of OHWM) is characterized as providing important habitat, for which impacts associated with additional overwater structure should be avoided as a top priority. Unless other minimization or mitigation provisions (such as vegetation enhancement) are clearly preferred by WDFW or justified through additional supporting analysis, pier/dock width should be minimized to only exceed 4-feet (and no greater than 6-feet) when justified to accommodate ADA access needs.

Relevant provisions from WAC 173-26-231(3)(b): “Pier and dock construction shall be restricted to the minimum size necessary to meet the needs of the proposed water-dependent use.”...“Piers and docks, including those accessory to single-family residences, shall be designed and constructed to avoid or, if that is not possible, to minimize and mitigate the impacts to ecological functions, critical areas resources such as eelgrass beds and fish habitats and processes such as currents and littoral drift. See WAC [173-26-221](#) (2)(c)(iii) and (iv). Master programs should require that structures be made of materials that have been approved by applicable state agencies.”

REFERENCES:

- Watershed & Makers 2010a, The Watershed Company and Makers. February 2010. DRAFT Shoreline Analysis Report for the City of Lake Stevens Shorelines: Lake Stevens, Catherine Creek, and Little Pilchuck Creek. Prepared for the City of Lake Stevens Planning and Community Development Department, Lake Stevens, WA.
- Watershed & Makers 2010b, The Watershed Company and Makers. December 2010. Cumulative Impacts Analysis for the City of Lake Stevens Shorelines: Lake Stevens, Catherine Creek, and Little Pilchuck Creek. Prepared for the City of Lake Stevens Planning and Community Development Department, Lake Stevens, WA.
- Snohomish Basin Salmon Recovery Forum (WRIA 7). 2005. Snohomish River Basin Salmon Conservation Plan Final. June 2005.
- Ecology, 2011. Department of Ecology Shoreline Master Program Handbook; SMP Updates Piers, Docks and other structures. Accessed at:
http://www.ecy.wa.gov/programs/sea/shorelines/smp/handbook/pdf/Piers_docks_guidance_1-10-11.pdf

SHORELINE MASTER PROGRAM SUBMITTAL CHECKLIST

This checklist is for use by local governments to satisfy the requirements of WAC 173-26-201(3)(a), relating to submittal of Shoreline Master Programs (SMPs) for review by the Department of Ecology (Ecology) under Chapter 173-26 WAC. The checklist does not create new or additional requirements beyond the provisions of that chapter.

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This checklist is intended to help in preparation and review of local shoreline master programs (SMPs). Local governments should include a checklist with all SMPs submitted for review by Ecology.

Information provided at the top of the checklist identifies what local jurisdiction and specific amendment (e.g. comprehensive update, environment re-designation or other topic) the checklist is submitted for, and who prepared it. Indicate in the location column where in the SMP (or other documents) the requirement is satisfied. If adopting other regulations by reference, identify what specific adopted version of a local ordinance is being used, and attach a copy of the relevant ordinance (*see example 1, below*).

Draft submittals: For draft submittals, local governments may use the Comments column to note any questions or concerns about proposed language. Ecology may then use the Comment field to respond (*see example 2, below*).

Final submittals: When submitting locally-approved SMPs for Ecology review, leave the comment field blank. Ecology will use the comment field to develop final comments on the SMP.

Ecology has attempted to make this checklist an accurate and concise summary of rule requirements, however the agency must rely solely on adopted state rules and law in approving or denying a master program. This document does not create new or additional requirements beyond the provisions of state laws and rules [WAC 173-26-201(3)(a)].

EXAMPLE 1: reference other documents if necessary

STATE RULE (WAC) REQUIREMENTS	LOCATION	COMMENTS
Inventory of existing data and materials. WAC 173-26-201(3)(c)(i) through (x).	Appendix A: Shoreline Inventory and Analysis, Section 2.	
Wetland buffer requirements are adequate to ensure wetland functions are protected and maintained in the long-term, taking into account ecological functions of the wetland, characteristics of the buffer, and potential impacts associated with adjacent land uses. WAC 173-26-221(2)(c)(i)(B)	City Ordinance CA 19.072, adopted July 17 2003, p. 32	

EXAMPLE 2: for draft submittals, use Comments column

STATE RULE (WAC) REQUIREMENTS	LOCATION	COMMENTS
High-intensity environment designation criteria: Areas within incorporated municipalities, "UGAs," and "rural areas of more intense development" (<i>see RCW 36.70A.070</i>) that currently support or are planned for high-intensity water-dependent uses. WAC 173-26-211(5)(d)(iii)	Urban Industrial, p. 15 Urban Mixed, p. 18 Also see Appendix B, Use Analysis, Chapter 3, p. 12.	Local government: SMP includes two urban designations that meet high-intensity criteria – Urban Industrial, and Urban Mixed. These alternative designations allow more specificity for public access, view and amenity requirements for the mixed use areas. Ecology: Proposed alternative designations are consistent with the purposes and policies of the high-intensity criteria, as per WAC 173-26-211(4)(c).

Acronyms and abbreviations comp plan: Comprehensive Plan CUP: Conditional Use Permit SMA: Shoreline Management Act, RCW 90.58 SMP: Shoreline Master Program SSWS: Shorelines of Statewide Significance WAC: Washington Administrative Code	For more information www.ecy.wa.gov/programs/sea/SMA/index.html Ecology SMA Policy Lead: Peter Skowlund: (360) 407-6522
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Prepared for: (Jurisdiction Name) Name of Amendment: Prepared by: Dara O'Byrne, MAKERS architecture (Name) Date: 10/23/2009		
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STATE RULE (WAC) REQUIREMENTS	LOCATION	COMMENTS
DOCUMENTATION OF SMP DEVELOPMENT PROCESS		
Public involvement, communication, and coordination		
Documentation of public involvement throughout SMP development process. WAC 173-26-201(3)(b)(i) and WAC 173-26-090 and 100. For SSWS, see WAC 173-26-251(3)(a)		The City has prepared a submitted a public participation plan to WDOE, but has not yet begun the public participation process.
Documentation of communication with state agencies and affected Indian tribes throughout SMP development. WAC 173-26-201(3)(b)(ii) and (iii), WAC 173-26-100(3). For saltwater shorelines, see WAC 173-26-221(2)(c)(iii)(B). For SSWS, see WAC 173-26-251(3)(a).		The City has sent a letter to all relevant agencies and organizations to solicit information and feedback.
Demonstration that critical areas regulations for shorelines are based on the SMA and the guidelines, and are at least equal to the current level of protection provided by the currently adopted critical areas ordinance. WAC 173-26-221(2)(b)(ii),(iii) and (c).	3.A.3	Adopts CAO by reference, except provisions conflicting with the SMP.
Documentation of process to assure that proposed regulatory or administrative actions do not unconstitutionally infringe upon private property rights . See <i>"State of Washington, Attorney General's Recommended Process for Evaluation of Proposed Regulatory or Administrative Actions to Avoid Unconstitutional Takings of Private Property."</i> WAC 173-26-186(5).		Uses are allowed in all environments.
Final submittal includes: evidence of local government approval (or a locally approved "statement of intent to adopt"); new and/or amendatory text, environment designation maps (with boundary descriptions and justification for changes based on existing development patterns, biophysical capabilities and limitations, and the goals and aspirations of the local citizenry); a summary of the proposal together with staff reports and supporting materials; evidence of SEPA compliance; copies of all comments received with names and addresses. WAC 173-26-110 Submittal must include clear identification and transmittal of all provisions that make up the SMP. <i>This checklist, if complete, meets this requirement.</i> WAC 173-26-210(3)(a) and (h).		This is not the final submittal. A Cumulative Impact Assessment is being prepared.

STATE RULE (WAC) REQUIREMENTS	LOCATION	Page 246 COMMENTS
Shoreline Inventory		
<p>Inventory of existing data and materials. WAC 173-26-201(3)(c)(i) through (x).</p> <p>For jurisdictions with critical saltwater habitats, see WAC 173-26-221(2)(c)(iii)(A)&(B).</p>		See Characterization Report.
Shoreline Analysis		
<p>Characterization of shoreline ecosystems and their associated ecological functions that:</p> <ul style="list-style-type: none"> identifies ecosystem-wide processes and ecological functions; assesses ecosystem-wide processes to determine their relationship to ecological functions; identifies specific measures necessary to protect and/or restore the ecological functions and ecosystem-wide processes. WAC 173-26-201(3)(d)(i)(A). <p>Demonstration of how characterization was used to prepare master program policies and regulations that achieve no net loss of ecological functions necessary to support shoreline resources and to plan for restoration of impaired functions. WAC 173-26-201(3)(d)(i)(E).</p> <p>For vegetation, see WAC 173-26-221(5). For jurisdictions with critical saltwater habitats, see WAC 173-26-221(2)(c)(iii)(B).</p> <p>Description of data gaps, assumptions made and risks to ecological functions associated with SMP provisions. WAC 173-26-201(2)(a)</p> <p>Characterization includes maps of inventory information at appropriate scale. WAC 173-26-201(3)(c)</p>	<p>DRAFT Shoreline Analysis Report for City of Lake Stevens Shorelines: Lake Stevens, Catherine Creek, and Little Pilchuck Creek.</p> <p>Section 4: Analysis of Ecological Functions and Ecosystem Wide Processes</p> <p>Section 7: Shoreline Management Recommendations</p> <p>Section 3.4: Data Gaps</p> <p>Appendix D: Map Folio</p>	<p>The consultant team has assembled a characterization and analysis report that accomplishes the objectives described to the left.</p>

<p>Attachment 2 STATE RULE (WAC) REQUIREMENTS</p>	<p>Page 247 LOCATION</p>	<p>COMMENTS</p>
<p>Use analysis estimating future demand for shoreline space and potential use conflicts based on characterization of current shoreline use patterns and projected trends. Evidence that SMP ensures adequate shoreline space for projected shoreline preferred uses. Public access needs and opportunities within the jurisdiction are identified. Projections of regional economic need guide the designation of "high-intensity" shoreline. WAC 173-26-201(3)(d)(ii) & (v); WAC 173-26-211(5)(d)(ii)(B)</p> <p>For SMPs that allow mining, demonstration that siting of mines is consistent with requirements of WAC 173-26-241(3)(h)(i).</p> <p>For SSWS:</p> <p>evidence that SMP preserves adequate shorelands and submerged lands to accommodate current and projected demand for economic resources of statewide importance (e.g., commercial shellfish beds and navigable harbors) based on statewide or regional analyses, requirements for essential public facilities, and comment from related industry associations, affected Indian tribes, and state agencies.</p> <p>Evidence that public access and recreation requirements are based on demand projections that take into account activities of state agencies and interests of the citizens to visit public shorelines with special scenic qualities or cultural or recreational opportunities. WAC 173-26-251(3)(c)(ii) & (iii)</p> <p>Optimum implementation directives incorporated into comp plan and development regulations. WAC 173-26-251(2) & (3)(e)</p> <p>For GMA jurisdictions, SMP recreational provisions are consistent with growth projections and level-of-service standards contained in comp plan. WAC 173-26-241(3)(i)</p>	<p>Shoreline Analysis Report for City of Lake Stevens Shorelines: Lake Stevens, Catherine Creek, and Little Pilchuck Creek.</p> <p>3.B</p> <p>Section 5 Land Use Analysis and Implications</p> <p>3.B</p> <p>Section 6 Public Access Analysis and Implications</p> <p>Policy 3.B.6.b.11 calls for acquisition of property for a new park on the recently annexed shoreline.</p>	<p>The consultant team has assembled a characterization and analysis report that accomplishes the objectives described to the left.</p> <p>Lake Stevens does not have any economic resources of statewide significance.</p> <p>Lake Stevens has adequate public access and recreation to serve the local community, but is generally not considered a regional or state draw for recreation.</p> <p>The SMP recreational provisions are consistent with the City's comp plan, identifying the recently annexed area of the City as needing additional public access and recreation facilities. Lake Stevens is not generally considered a regional or state attraction for recreation</p>
<p>Restoration plan that:</p> <ul style="list-style-type: none"> identifies degraded areas, impaired ecological functions, and potential restoration sites; Establishes restoration goals and priorities, including SMP goals and policies that provide for restoration of impaired ecological functions; Identifies existing restoration projects and programs; Identifies additional projects and programs needed to achieve local restoration goals, and implementation strategies including identifying prospective funding sources sets timelines and benchmarks for implementing restoration projects and programs; provides mechanisms or strategies to ensure that restoration projects and programs will be implemented according to plans and to appropriately review the effectiveness of the projects and programs in meeting the overall restoration goals. WAC 173-26-186(8)(c); 201(2)(c)&(f) <p>For critical freshwater habitats: incentives to restore water connections impeded by previous development. WAC 173-26-221(2)(c)(iv)(C)(III).</p> <p>For SSWS, identification of where natural resources of statewide importance are being diminished over time, and master programs provisions that contribute to the restoration of those resources. WAC 173-26-251(3)(b)</p>	<p><i>(Ecology 11-2-2010) Note: Comments for this section are in reference to a Draft Restoration Plan dated September 2010.</i></p>	<p><i>Compliant:</i></p> <p><i>The draft report appears to contain the necessary elements as required by the SMP-Guidelines.</i></p>

Attachment 2 STATE RULE (WAC) REQUIREMENTS	LOCATION Page 248	COMMENTS
<p>Evidence that each environment designation is consistent with guidelines criteria [WAC 173-26-211(5)], as well as existing use pattern, the biological and physical character of the shoreline and the goals and aspirations of the community. WAC 173-26-211(2)(a). WAC 173-26-110(3)</p> <p>Lands designated as "forest lands of long-term significance" under RCW 36.70A.170 are designated either natural or rural conservancy shoreline environment designations. WAC 173-26-241(3)(e).</p> <p>For SSWS, demonstration that environment designation policies, boundaries, and use provisions implement SMA preferred use policies of RCW 90.58.020(1) through (7). WAC 173-26-251(3)(c)</p>	See Chapter 2	The environment designations suggested in the WAC were used in a consistent manner.

Attachment 2 STATE RULE (WAC) REQUIREMENTS	LOCATION Page 249	COMMENTS
<p>Assessment of how proposed policies and regulations cause, avoid, minimize and mitigate cumulative impacts to achieve no net loss policy. Include policies and regulations that address platting or subdividing of property, laying of utilities, and mapping of streets that establish a pattern for future development. Evaluation addresses:</p> <p>(i) <i>current circumstances</i> affecting the shorelines and relevant natural processes;</p> <p>(ii) reasonably <i>foreseeable future development</i> and use of the shoreline (including impacts from unregulated activities, exempt development, and other incremental impacts); and</p> <p>(iii) <i>beneficial effects</i> of any established regulatory programs under other local, state, and federal laws. WAC 173-26-201(3)(d)(iii) and WAC 173-26-186(8)(d)</p> <p>For jurisdictions with critical saltwater habitats, identification of methods for monitoring conditions and adapting management practices to new information. WAC 173-26-221(2)(c)(iii)(B).</p> <p>For SSWS, evidence that standards ensuring protection of ecological resources of statewide importance consider cumulative impacts of permitted development. WAC 173-26-251(3)(d)(i)</p>	<p>The draft Cumulative Impact Analysis 26 August 2010 accompanies this checklist.</p>	<p>The Cumulative Impact Analysis discusses impacts to all environments and focuses on impacts do to potential new (mostly residential) site development, overwater structures (the potential for new residential docks) and shoreline armoring. Potential new development and structures are limited by SMP provisions and repair of existing shoreline modifications will improve ecological functions.</p> <p>The analysis finds that the proposed SMP is projected to achieve no net loss of ecological functions on Lake Stevens shorelines.</p> <p>(Generally) Compliant (Questions):</p> <p>The draft CIA appears to be generally compliant with the SMP-Guideline requirements. Related to Residential setbacks and determination of No Net Loss (NNL) of Ecological functions, the chart on page 24 summarizing average setbacks ranging from 64-103 feet does not seem consistent with the NNL determination based on a 60-foot shoreline (SMP) setback (i.e. less than the existing avg. setback)?</p> <p>Please further explain how potential reduction of the existing setback to the proposed 60-foot setback is consistent with mitigation sequencing (avoid, min, mitigate) and NNL of shoreline ecological functions</p> <p>RESPONSE: The minimum setback we are requiring is 60', but in many cases the requirement will be more because we are requiring the averaging of the two adjacent neighbors with a minimum of 60'. Dan will clarify this in the CIA. In addition, the current CAO requirement is 60'.</p>
SMP CONTENTS		
<p>Any goals adopted as part of the SMP are consistent with the SMA. (Note: Goal statements are not required.)</p>		<p>The policy statements serve as goal statements.</p>

STATE RULE (WAC) REQUIREMENTS	LOCATION	COMMENTS
<p>Policies (A) are consistent with guidelines and policies of the SMA; (B) address elements of RCW 90.58.100; and (C) include policies for environment designations, accompanied by a map or physical description of designation boundaries in sufficient detail to compare with comprehensive plan land use designations. (D) are consistent with constitutional and other legal limitations on regulation of private property. WAC 173-26-191(2)(a)(i)</p> <p>SMP implements preferred use policies of the SMA. WAC 173-26-201(2)(d)</p>	<p>Chapter 2 and Appendices.</p> <p>Preferred use policies are in 5.C.1.b.1</p>	<p>(Generally) Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
<p>Regulations: (A) are sufficient in scope and detail to ensure the implementation of SMA, SMP guidelines, and SMP policies; (B) include environment designation regulations; (C) include general regulations, use regulations that address issues of concern in regard to specific uses, and shoreline modification regulations; and, (D) are consistent with constitutional and other legal limitations on the regulation of private property. WAC 173-26-191(2)(a)(ii)</p>	<p>Chapters 2, 3, 4, and 5</p>	<p>(Generally) Compliant:</p> <p>See detailed response below.</p>
ENVIRONMENT DESIGNATIONS		
<p>Each environment designation includes: Purpose statements, classification criteria, management policies, and regulations (types of shoreline uses permitted, conditionally permitted, and prohibited; building or structure height and bulk limits, setbacks, maximum density or minimum frontage requirements, and site development standards). WAC 173-26-211(2)(4).</p>	<p>Chapter 2</p>	<p>Common legal descriptions will be added in tabular form.</p> <p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
<p>An up-to-date map accurately depicting environment designation boundaries on a map. If necessary, include common boundary descriptions. WAC 173-26-211(2)(b); WAC 173-26-110(3);</p>	<p>Appendices</p>	<p>TBD.</p>
<p>Statement that undesigned shorelines are automatically assigned a conservancy environment designation. WAC 173-26-211(2)(e).</p>	<p>2.A (last paragraph)</p>	<p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
Natural environment. WAC 173-26-211(5)(a)		
<p>Designation criteria: Shorelines that are ecologically intact and performing functions that could be damaged by human activity, of particular scientific or educational interest, or unable to support human development without posing a safety threat. WAC 173-26-211(5)(a)(iii)</p>	<p>2.C.1.b</p>	<p>"Natural" designation is used for wetland complexes. There are no other ecologically intact shorelines.</p> <p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>

Attachment 2 STATE RULE (WAC) REQUIREMENTS	LOCATION Page 251	COMMENTS
Prohibition on new: uses that would substantially degrade ecological functions or natural character of shoreline. WAC 173-26-211(5)(a)(ii)(A) Commercial uses; industrial uses; nonwater oriented recreation; roads, utility corridors, and parking areas. WAC 173-26-211(5)(a)(ii)(B) development or significant vegetation removal that would reduce the capability of vegetation to perform normal ecological functions. WAC 173-26-211(5)(a)(ii)(G) subdivision of property in a configuration that will require significant vegetation removal or shoreline modification that adversely impacts ecological functions. WAC 173-26-211(5)(a)(ii)(G)	2.C.1.c	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
For single family residential development : limits on density and intensity to protect ecological functions, and requirement for CUP. WAC 173-26-211(5)(a)(ii)(C)	5.B shoreline use table	Single-family residences are not allowed in a "natural environment." Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
For commercial forestry : requirement for CUP, requirement to follow conditions of the State Forest Practices Act. WAC 173-26-211(5)(a)(ii)(D)	5.B shoreline use table	Commercial forestry is prohibited in a "natural environment." Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
For agriculture : low intensity use allowed if subject to appropriate limits or conditions to assure that the use does not expand or practices don't conflict with purpose of the designation. WAC 173-26-211(5)(a)(ii)(E)	5.B shoreline use table	Only existing agricultural uses are allowed as a conditional use. Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Low intensity public uses such as scientific, historical, cultural, educational research uses, and water-oriented recreational access allowed if ecological impacts are avoided. WAC 173-26-211(5)(a)(ii)(F)	5.B shoreline use table, note 3	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Rural conservancy. WAC 173-26-211(5)(b)		
Designation criteria : areas outside municipalities or UGAs with: (A) low-intensity, resource-based uses, (B) low-intensity residential uses, (C) environmental limitations such as steep banks or floodplains, (D) high recreational or cultural value, or (E) low-intensity water-dependent uses. WAC 173-26-211(5)(b)(iii)	N/A	

Attachment 2 STATE RULE (WAC) REQUIREMENTS	LOCATION	Page 252 COMMENTS
<p>Restrictions on use and development that would degrade or permanently deplete resources. Water-dependent and water-enjoyment recreation facilities are preferred uses. Low intensity, water-oriented commercial and industrial uses limited to areas where those uses have located in the past or at sites that possess conditions and services to support the development. WAC 173-26-211(5)(b)(ii)(A) and (B)</p> <p>For SMPs that allow mining, see WAC 173-26-241(3)(h).</p>	N/A	
<p>Prohibition on new structural shoreline stabilization and flood control works except where there is documented need to protect an existing primary structure (provided mitigation is applied) or to protect ecological functions. WAC 173-26-211(5)(b)(ii)(C).</p>	N/A	
<p>Development standards for residential use that preserve existing character of the shoreline. Density, lot coverage, vegetation conservation and other provisions that ensure no net loss of shoreline ecological functions.</p> <p>Density or lot coverage limited to a maximum of ten percent total impervious surface area within the lot or parcel, or alternative standard that maintains the existing hydrologic character of the shoreline. (May include provisions allowing greater lot coverage for lots legally created prior to the adoption of a master program prepared under these guidelines, if lot coverage is minimized and vegetation is conserved.) WAC 173-26-211(5)(b)(ii)(D).</p>	N/A	
Aquatic. WAC 173-26-211(5)(c)		
<p>Designation criteria: Areas waterward of the ordinary high-water mark (OHWM). WAC 173-26-211(5)(c)(iii)</p>	2.C.5.b	<p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
<p>New over-water structures:</p> <p>allowed only for water-dependent uses, public access, or ecological restoration. WAC 173-26-211(5)(c)(ii)(A) limited to the minimum necessary to support the structure's intended use. WAC 173-26-211(5)(c)(ii)(B)</p>	2.C.5.c.1	<p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
<p>Multiple use of over-water facilities encouraged. WAC 173-26-211(5)(c)(ii)(C)</p>	2.C.5.c.3	<p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
<p>Location and design of all developments and uses required to:</p> <p>minimize interference with surface navigation, to consider impacts to public views, and to allow for the safe, unobstructed passage of fish and wildlife, particularly those species dependent on migration. WAC 173-26-211(5)(c)(ii)(D)</p> <p>prevent water quality degradation and alteration of natural hydrographic conditions. WAC 173-26-211(5)(c)(ii)(F)</p>	2.C.5.c.5	<p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
<p>Uses that adversely impact ecological functions of critical saltwater and freshwater habitats limited (except where necessary for other SMA objectives, and then only when their impacts are mitigated). WAC 173-26-211(5)(c)(ii)(E)</p>	2.C.5.c.5	<p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>

STATE RULE (WAC) REQUIREMENTS	LOCATION	Page 253 COMMENTS
High-intensity. WAC 173-26-211(5)(d)		
<p>Designation criteria: Areas within incorporated municipalities, "UGAs," and "rural areas of more intense development" (see RCW 36.70A.070) that currently support or are planned for high-intensity water-dependent uses. WAC 173-26-211(5)(d)(iii)</p>	2.C.2.b	<p>(Generally) Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p> <p>Note: does not specifically say WD commercial/industrial</p> <p>RESPONSE: Added a policy that points out that the Creeks are non-navigable and nonwater-oriented development will be allowed provided ecological restoration is provided. Much of the HI Environment is on creeks with a 160' setback so the potential for water-dependent uses is insignificant. Also, there is the statement that uses "include, or do not detract from the potential for water-oriented uses"</p>
<p>Priority given first to water-dependent uses, then to water-related and water-enjoyment uses. New non-water oriented uses prohibited except as part of mixed use developments, or where they do not conflict with or limit opportunities for water oriented uses or where there is no direct access to the shoreline. WAC 173-26-211(5)(d)(ii)(A)</p>	2.C.2.c.1	<p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
<p>Full use of existing urban areas required before expansion of intensive development allowed. WAC 173-26-211(5)(d)(ii)(B)</p>		<p>This was done by setting HI designation boundaries.</p> <p>TBD - Not clear if this SMP-Guideline requirement has been adequately satisfied?</p> <p>RESPONSE: All shorelines are nearly completely developed so this requirement is met implicitly.</p>
<p>New development does not cause net loss of shoreline ecological functions. Environmental cleanup and restoration of the shoreline to comply with relevant state and federal laws assured. WAC 173-26-211(5)(d)(ii)(C)</p>	2.C.2.c.1-2	<p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
<p>Visual and physical public access required where feasible. Sign control regulations, appropriate development siting, screening and architectural standards, and maintenance of natural vegetative buffers to achieve aesthetic objectives. WAC 173-26-211(5)(d)(ii)(D) and (E)</p>	2.C.2.c.3-4	<p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>

STATE RULE (WAC) REQUIREMENTS	LOCATION	Page 254 COMMENTS
Urban conservancy. WAC 173-26-211(5)(e)		
<p>Designation criteria: Areas within incorporated municipalities, UGAs, and rural areas of more intense development that are not suitable for water-dependent uses and that are either suitable for water-related or water-enjoyment uses, are flood plains, have potential for ecological restoration, retain ecological functions, or have potential for development that incorporates ecological restoration. WAC 173-26-211(5)(e)(iii)</p>	2.C.3.b	<p>(Generally) Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p> <p>Suggestion:</p> <p>The last sentence of the Designation Criteria (2.C.3.b) does not read clearly. Suggest rewording the sentence to clearly state the intent of the UC designation to be applied where no other commercial or residential land use exist.</p> <p>RESPONSE: Statement updated and clarified.</p>
<p>Allowed uses are primarily those that preserve natural character of area, promote preservation of open space, floodplain or sensitive lands, or appropriate restoration. WAC 173-26-211(5)(e)(ii)(A)</p> <p>Priority given to water-oriented uses over non-water oriented uses. For shoreline areas adjacent to commercially navigable waters, water-dependent uses given highest priority. WAC 173-26-211(5)(e)(ii)(D)</p> <p>For SMPs that allow mining, see WAC 173-26-241(3)(h).</p>	2.C.3.c.1-4	<p>See also the use chart at 5.B.</p> <p>TBD:</p> <p>The Master Program appears generally consistent with this SMP-Guideline requirement.</p> <p>Question related to regulation (c.2) don't Guidelines also reference ecological restoration?</p> <p>RESPONSE: Added language to c.2 to include "enhancing ecological functions"</p>
<p>Standards for shoreline stabilization measures, vegetation conservation, water quality, and shoreline modifications that ensure new development does not result in a net loss of shoreline ecological functions or degrade other shoreline values. WAC 173-26-211(5)(e)(ii)(B)</p>	2.C.3.c.5-6	<p>See also the use chart at 5.B and shoreline modification chart at 4.B.</p> <p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
<p>Public access and recreation required where feasible and ecological impacts are mitigated. WAC 173-26-211(5)(e)(ii)(C)</p>	2.C.3.c.7	<p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
Shoreline residential. WAC 173-26-211(5)(f)		
<p>Designation criteria: Areas within incorporated municipalities, Urban Growth Areas (UGAs), "rural areas of more intense development," and "master planned resorts" (see RCW 36.70A.360) that are predominantly residential development or planned and platted for residential development. WAC 173-26-211(5)(f)(iii)</p>	2.C.4.b	<p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>

Attachment 2 STATE RULE (WAC) REQUIREMENTS	LOCATION Page 255	COMMENTS
Standards for density or minimum frontage width, setbacks, buffers, shoreline stabilization, critical areas protection, and water quality protection assure no net loss of ecological function. WAC 173-26-211(5)(f)(ii)(A)	2.C.4.c.5	See also the charts at 4.B and 5.B. (Generally) Compliant: The Master Program appears generally consistent with this SMP-Guideline requirement. Research CIA and residential development standards b4 finalizing. RESPONSE: The CIA indicates>NNL is achieved with the draft>NNL. Also, see response above regarding residential setbacks.
Multifamily and multi-lot residential and recreational developments provide public access and joint use for community recreational facilities. WAC 173-26-211(5)(f)(ii) (B)	2.C.4.c.6	Not Compliant: The referenced standard provides "community access for residents of that development", which is not public access as required by the SMP-Guidelines. RESPONSE: Draft revised to require that new multifamily development provide public access.
Access, utilities, and public services required to be available and adequate to serve existing needs and/or planned future development. WAC 173-26-211(5)(f)(ii)(C)	2.C.4.c.3	Compliant: The referenced standard and c.4 within the same section appear consistent with this SMP-Guideline requirement.
Commercial development limited to water-oriented uses. WAC 173-26-211(5)(f)(ii)(D)		Commercial uses are not permitted in "shoreline residential." (Generally) Compliant: The Master Program appears consistent with this SMP-Guideline requirement.

STATE RULE (WAC) REQUIREMENTS	LOCATION	Page 256 COMMENTS
GENERAL POLICIES AND REGULATIONS		
Archaeological and Historical Resources. WAC 173-26-221(1)		
Developers and property owners required to stop work and notify the local government, state office of archaeology and historic preservation and affected Indian tribes if archaeological resources are uncovered during excavation. WAC 173-26-221(1)(c)(i)	3.B.2.c.1	<p>Not Compliant:</p> <p>The reference provision does not include notice to affected Indian tribes.</p> <p>Requirement:</p> <p>The referenced section of the SMP will need to be amended to adequately reference affected Indian tribes for notice and consultation in the event that archaeological resources are uncovered during any site excavation.</p> <p>RESPONSE: This section was updated per the suggestions above.</p>
Permits issued in areas documented to contain archaeological resources require site inspection or evaluation by a professional archaeologist in coordination with affected Indian tribes WAC 173-26-221(1)(c)(ii)	2.B.6 c.2	<p>Not Compliant:</p> <p>Similar to comment above, the provision does not reference a "professional" archaeologist and should be amended to ensure potentially affected Indian tribes are notified and in coordination with the City and the property owner if archaeological resources are discovered.</p> <p>RESPONSE: This section was updated per the suggestions above.</p>

Attachment 2 STATE RULE (WAC) REQUIREMENTS	LOCATION	Page 257 COMMENTS
Critical areas. WAC 173-26-221(2)		

Attachment 2 STATE RULE (WAC) REQUIREMENTS	LOCATION Page 258	COMMENTS
<p>Policies and regulations for critical areas (designated under GMA) located within shorelines of the state: (i) are consistent with SMP guidelines, and (ii) provide a level of protection to critical areas within the shoreline area that is at least equal to that provided by the local government's existing critical area regulations adopted pursuant to the GMA for comparable areas other than shorelines. WAC 173-26-221(2)(a) and (c)</p> <p>Planning objectives are for protection <i>and restoration</i> of degraded ecological functions and ecosystem-wide processes.</p> <p>Regulatory provisions <i>protect</i> existing ecological functions and ecosystem-wide processes. WAC 173-26-221(2)(b)(iv)</p> <p>Critical area provisions promote human uses and values, such as public access and aesthetic values, provided they do not significantly adversely impact ecological functions. WAC 173-26-221(2)(b)(v)</p>	<p>3.B.3</p>	<p>References the City's CAO, except for provisions not consistent with the SMA.</p> <p>Not Compliant:</p> <p>The referenced the City's existing Critical Areas Ordinance needs to provide the date that the Ordinance was adopted in addition to the Ordinance number.</p> <p>RESPONSE: This was updated throughout the document.</p> <p><u>(Ecology 11-2-2010): The CAO reference only excludes sections 14.88.310 (Reasonable Use), 14.16C.115 (Procedural) and "Exemption 11" (Plating). Please see the following Questions/Concerns related to this section:</u></p> <p><u>The specific reference to section 14.88.310 (Reasonable Use) does not appear to cover all the exceptions within the CAO. The following sections also do not appear consistent with the SMP-Guidelines:</u></p> <p><u>Sections 14.88.210(a) (1-3) and 14.88.250 granting the Planning Director authority to exempt activities (.210) or adopt admin. procedures (.250) within critical areas, which is not consistent with the SMP-Guidelines.</u></p> <p><u>Section 14.88.320 appears to provide a mechanism to exempt activities within critical areas based on illustration of an economic hardship, which is not consistent with the SMP-Guidelines.</u></p> <p>RESPONSE: Added to 3B3b – 210(a), 250 & 320.</p> <p><u>(Question) The specific reference to section "14.16.115" (SMP section 3.B.3 (2) c pages 20-21) is not found within the CAO (14.88). Is this a typo or is this a reference to a different Ordinance?</u></p> <p>RESPONSE: Moved to 3B1a2</p> <p><u>(Question) The specific reference to "Exemption 11" (SMP section 3.B.3 (2) d. page 20) is not adequately defined. It is not clear where this exemption exists in the referenced CAO?</u></p> <p>RESPONSE Removed.</p> <p><u>Other general CAO Questions:Are the Non-Conforming Activities in 14.88.330 consistent with the SMP's Non-Conforming standards? Ecology suggests not including this section in the SMP.</u></p> <p>RESPONSE: Added new 3B3c</p> <p><i>Is Part IX (Transfer of Dev. Rights) intended to be included in the SMP? Ecology suggests not including this section in the SMP.</i></p> <p>RESPONSE: Added new 3B3d.</p>

STATE RULE (WAC) REQUIREMENTS	LOCATION	COMMENTS
<p>If SMP includes optional expansion of jurisdiction: Clear description of the inclusion of any land necessary for buffers of critical areas that occur within shorelines of the state, accurately depicting new SMP jurisdiction consistent with RCW 90.58.030(2)(f)(ii) and WAC 173-26-221(2)(a).</p>	<p>N/A</p>	<p>Compliant:</p> <p><u>Standard 3.B.3.2.a. appears to state that the City does not plan to utilize the optional expansion.</u></p>
Wetlands. WAC 173-26-221(2)(c)(i)		
<p>Wetlands definition are consistent with WAC 173-22.</p>	<p>3.B.3(2)</p>	<p>Lake Stevens Municipal Code (LSMC) §14.88.100 [Definitions], ¶(ppp) wetland definition is mostly consistent with WAC 173-22 except for two discrepancies.</p> <p>Not Compliant:</p> <p>The following quoted text should be added to the wetland definition: ...wastewater treatment facilities, farm ponds, and landscape amenities, <u>“or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway”.</u></p> <p>RESPONSE: Added Wetlands definition with this new language to Chap 6. Shoreline code amendments will add this wording to the wetlands definition in 14.88.100.</p> <p>Reference to the Federal Manual for Identifying and Delineating Jurisdictional Wetlands should be stricken from the wetland definition.</p> <p>RESPONSE: Made change to wetlands definition in SMP. Shoreline code amendments will remove this wording and add reference to the Washington State Wetlands Identification and Delineation Manual.</p>

STATE RULE (WAC) REQUIREMENTS	LOCATION	COMMENTS
<p>Provisions requiring wetlands delineation method are consistent with WAC 173-22-035.</p>	<p>3.B.3(2)</p>	<p>LSMC §14.88.800 and §14.88.810 requiring wetland delineations are consistent with WAC 173-22-035.</p> <p>Not Compliant:</p> <p>However, LSMC §14.88.260 allows critical areas reports to be waived by the Planning Director "if it is deemed unnecessary to make a compliance determination". This provision may not be consistent with LSMC §14.88.800 and §14.88.810 or comply with WAC 173-22-035.</p> <p>RESPONSE: Added new appendix with critical areas regulations related to shorelines. City continues to work with WDOE on finalizing this appendix.</p>
<p>Regulations address all uses and activities listed in WAC 173-26-221(2)(c)(i)(A) to achieve no net loss of wetland area and functions including lost time when the wetland does not perform the function. [WAC 173-26-221(2)(c)(i)(A) + (C)]</p>		<p>Not Compliant:</p> <p>The allowed activities in LSMC §14.88.220 [Allowed Activities] §14.88.820 [Allowed Activities] are not consistent with the uses and activities listed in WAC 173-26-221(2)(c)(i)(A) and will likely not achieve no net loss of wetland area or function.</p> <p>RESPONSE: Added new appendix with critical areas regulations related to shorelines. City continues to work with WDOE on finalizing this appendix.</p>
<p>Wetlands rating or categorization system is based on rarity, irreplaceability, or sensitivity to disturbance of a wetland and the functions the wetland provides. Use Ecology Rating system or regionally specific, scientifically based method. WAC 173-26-221(2)(c)(i)(B)]</p>	<p>3.B.3(2)</p>	<p>Not Compliant:</p> <p>LSMC §14.88.800 classifies wetlands based on Ecology's Western Washington rating system. Some minor edits are recommended (e.g., eliminate discussion of estuarine wetlands)</p> <p>RESPONSE: Added new appendix with critical areas regulations related to shorelines. City continues to work with WDOE on finalizing this appendix.</p>

STATE RULE (WAC) REQUIREMENTS	LOCATION	COMMENTS
<p>Buffer requirements are adequate to ensure wetland functions are protected and maintained in the long-term, taking into account ecological functions of the wetland, characteristics of the buffer, and potential impacts associated with adjacent land uses. WAC 173-26-221(2)(c)(i)(B)</p>	3.B.3(2)	<p>Not Compliant:</p> <p><i>LSMC §14.88.830 (and 14.88.300) buffer requirements are not adequate to ensure wetland functions are protected.</i></p> <p>RESPONSE: Added new appendix with critical areas regulations related to shorelines. City continues to work with WDOE on finalizing this appendix.</p>
<p>Wetland mitigation requirements are consistent with WAC 173-26-201(2)(e) and which are based on the wetland rating. WAC 173-26-221(2)(c)(i)(E) and (F)</p>	3.B.3(2)	<p>Not Compliant:</p> <p><i>LSMC §14.88.840 wetland mitigation requirements are based on the wetland rating but are not entirely consistent with WAC 173-26-201(2)(e) or the replacement ratios in the Mitigation Guidance (Ecology Publ. #06-06-011a).</i></p> <p><i>The mitigation sequence listed in 173-26-201(2)(e) should be referenced in the SMP.</i></p> <p>RESPONSE: Added new appendix with critical areas regulations related to shorelines. City continues to work with WDOE on finalizing this appendix.</p>
<p>Compensatory mitigation allowed only after mitigation sequencing is applied and higher priority means of mitigation are determined to be infeasible.</p> <p>Compensatory mitigation requirements include (I) replacement ratios; (II) Performance standards for evaluating success; (III) long-term monitoring and reporting procedures; and (IV) long-term protection and management of compensatory mitigation sites. WAC 173-26-221(2)(c)(i)(F)</p> <p>Compensatory mitigation requirements are consistent with preference for “in-kind and nearby” replacement, and include requirement for watershed plan if off-site mitigation is proposed. WAC 173-173-26-201(2)(e)(B)</p>	3.B.3(2)	<p><i>Mitigation sequencing as listed in WAC 173-26-201(2)(e), except for monitoring [(WAC 173-26-201(2)(e)(F)] is included in the CAO at LSMC §14.88.010.</i></p> <p>Not Compliant:</p> <p><i>Compensatory mitigation requirements include replacement ratios that differ somewhat from the Mitigation Guidance.</i></p> <p><i>Compensatory mitigation requirements (LSMC §14.88.840) are not entirely consistent with a preference for “in-kind and nearby” replacement. LSMC §14.88.840 does not include a requirement for watershed plan if off-site mitigation is proposed.</i></p> <p>RESPONSE: Added new appendix with critical areas regulations related to shorelines. City continues to work with WDOE on finalizing this appendix.</p>

STATE RULE (WAC) REQUIREMENTS	LOCATION	Page 262 COMMENTS
Geologically Hazardous Areas. WAC 173-26-221(2)(c)(ii)		
<p>Prohibition on new development (or creation of new lots) that would:</p> <ul style="list-style-type: none"> cause foreseeable risk from geological conditions during the life of the development prohibited. WAC 173-26-221(2)(c)(ii)(B) require structural shoreline stabilization over the life of the development. (Exceptions allowed where stabilization needed to protect allowed uses where no alternative locations are available and no net loss of ecological functions will result.) WAC 173-26-221(2)(c)(ii)(C) 		<p>See the City's CAO.</p> <p><u>Non-Compliant:</u></p> <p><u>It is not clear: where in the CAO (14.88) adequate provisions exist consistent with these SMP-Guideline requirements?</u></p> <p><u>Further – section 14.88.650 providing administrative authority to alter existing standards, does not appear consistent with SMP-Guideline requirements. As stated within the Critical Areas section above, within shoreline areas, variation from SMP-standards should be evaluated through a formal Shoreline Variance process, for which an administrative approval process cannot be allowed to circumvent the variance review process.</u></p> <p>RESPONSE: Added new appendix with critical areas regulations related to shorelines. City continues to work with WDOE on finalizing this appendix.</p>
<p>New stabilization structures for existing primary residential structures allowed only where no alternatives (including relocation or reconstruction of existing structures), are feasible, and less expensive than the proposed stabilization measure, and then only if no net loss of ecological functions will result. WAC 173-26-221(2)(c)(ii)(D)</p>	4.C.2.c.4-11	<p><u>Non-Compliant:</u></p> <p><u>Similar comment provided below within “Shoreline Stabilization” (section 4.C.2) related to the general reference within this section to “development”. The SMP-Guidelines provide specific standards for Shoreline Stabilization, for which “hard” stabilization should be prohibited, unless a “demonstrated need” can be shown that the hard structure is needed to protect a “primary structure”. Therefore, hard structures cannot be considered to protect other parts of a “development” such as a yard, play court, gazebo, etc.</u></p> <p>RESPONSE: Changed language to ‘primary structure’.</p>

STATE RULE (WAC) REQUIREMENTS	LOCATION	Page 263 COMMENTS
Critical Saltwater Habitats. WAC 173-26-221(2)(c)(iii)		
<p>Prohibition on new docks, bulkheads, bridges, fill, floats, jetties, utility crossings and other human-made structures that intrude into or over critical saltwater habitats, except where:</p> <ul style="list-style-type: none"> public need is clearly demonstrated; avoidance of impacts is not feasible or would result in unreasonable cost; the project include appropriate mitigation; and the project is consistent with resource protection and species recovery. <p>Private, non-commercial docks for individual residential or community use allowed if it is infeasible to avoid impacts by alternative alignment or location and the project results in no net loss of ecological functions. WAC 173-26-221(2)(c)(iii)(C)</p>	N/A	
<p>Where inventory of critical saltwater habitat has not been done, all over water and near-shore developments in marine and estuarine waters require habitat assessment of site and adjacent beach sections. WAC 173-26-221(2)(c)(iii)(C)</p>	N/A	
Critical Freshwater Habitats. WAC 173-26-221(2)(c)(iv)		
<p>Requirements that ensure new development within stream channel, channel migration zone, wetlands, floodplain, hyporheic zone, does not cause a net loss of ecological functions. WAC 173-26-221(2)(c)(iv)(C)(I) and WAC 173-26-221(2)(c)(iv)(B)(II)</p>		<p>Also shoreline modification and use charts at 4.B and 5.B.</p> <p>TBD <u>Non-Compliant:</u></p> <p><u>See comments above within the Critical Areas section including Wetland and Geologically Hazardous Areas.</u></p> <p>RESPONSE: Added new appendix with critical areas regulations related to shorelines. City continues to work with WDOE on finalizing this appendix.</p>
<p>Authorization of appropriate restoration projects is facilitated. WAC 173-26-221(2)(c)(iv)(C)(III)</p>	3.B.5.c.3	<p>Not sure how to accomplish this.</p> <p><u>Compliant:</u></p> <p><u>The referenced standard appears appropriate. Also could reference other SMP sections in Chapter 3 & 4 including: Critical Areas, Environmental Impact, Vegetation Conservation, Water Quality/Quantity, General Policies/Regulations, Shoreline Restoration & Ecological Enhancement and the City's overall SMP-Restoration Plan..</u></p> <p>RESPONSE: Updated language</p>

Attachment 2 STATE RULE (WAC) REQUIREMENTS	LOCATION Page 264	COMMENTS
Regulations protect hydrologic connections between water bodies, water courses, and associated wetlands. WAC 173-26-221(2)(c)(iv)(C)(IV)	3.B.5.c.5	<u>Compliant:</u> <u>The referenced standard appears appropriate. Similar comment as above, i.e. could reference addition SMP sections</u> RESPONSE: Updated language
Flood Hazard Reduction. WAC 173-26-221(3)		
New development within the channel migration zone or floodway limited to uses and activities listed in WAC 173-26-221(3)(b) and (3)(c)(i)	3.B.5.c.2	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
New structural flood hazard reduction measures allowed only: where demonstrated to be necessary, and when non-structural methods are infeasible and mitigation is accomplished. landward of associated wetlands and buffer areas except where no alternative exists as documented in a geotechnical analysis. WAC 173-26-221(3)(c)(ii) & (iii)	3.B.5.c.2	See also 4.C.7 Compliant: The Master Program appears consistent with this SMP-Guideline requirement..
New publicly funded dikes or levees required to dedicate and improve public access (see exceptions). WAC 173-26-221(3)(c)(iv)	4.C.7.c.5	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Removal of gravel for flood control allowed only if biological and geomorphological study demonstrates a long-term benefit to flood hazard reduction, no net loss of ecological functions, and extraction is part of a comprehensive flood management solution. WAC 173-26-221(3)(c)(v)	3.B.5.c.11	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Public Access. WAC 173-26-221(4)		
Policies and regulations protect and enhance both physical and visual access . WAC 173-26-221(4)(d)(i)	3.B.7.b.1-12 and 3.B.7.c.1-11	Views are maintained at public properties. Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Public entities are required to incorporate public access measures as part of each development project, unless access is incompatible with safety, security, or environmental protection. WAC 173-26-221(4)(d)(ii)	3.B.7.c.1.a	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.

STATE RULE (WAC) REQUIREMENTS	LOCATION	COMMENTS
<p>Non-water-dependent uses (including water-enjoyment, water-related uses) and subdivisions of land into more than four parcels include standards for dedication and improvement of public access. WAC 173-26-221(4)(d)(iii)</p>	<p>3.B.7.c.1-2</p>	<p>(Generally) Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p> <p>Note: Section 2.C.4.c.6 within the Shoreline Residential designation section in chapter 2 is not consistent with either the SMP-Guidelines or this (Public Access) section of the SMP. Creation of 4 or more shoreline lots requires dedicated "public" access, not "community" access as currently written in the reference standard. This standard will need to be amended to be consistent with the SMP-Guidelines</p> <p>RESPONSE: Language updated.</p>
<p>Maximum height limits, setbacks, and view corridors minimize impacts to existing views from public property or substantial numbers of residences. WAC 173-26-221(4)(d)(iv); RCW 90.58.320</p>		<p>Height is limited to 35 feet above grade.</p> <p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
<p>Vegetation Conservation (Clearing and Grading). WAC 173-26-221(5)</p>		
<p>Vegetation standards implement the principles in WAC 173-26-221(5)(b). Methods to do this may include setback or buffer requirements, clearing and grading standards, regulatory incentives, environment designation standards, or other master program provisions. WAC 173-26-221(5)(c)</p>	<p>3.B.11</p>	<p>See also 5.C.8.c.2(c) and 5.C.8.c.3.</p> <p>Not Compliant:</p> <p>The Master Program appears generally consistent with these SMP-Guideline requirements, with the exception of 3.B.11.c.9. This standard appears to provide an exemption to the buffer standards to accommodate small, constrained lots. Providing such a 'reasonable use' exemption is not consistent with the SMP-Guidelines and should be amended to require a Shoreline Variance to consider development of these existing lots</p> <p>RESPONSE: Language updated.</p>
<p>Selective pruning of trees for safety and view protection is allowed and removal of noxious weeds is authorized. WAC 173-26-221(5)(c)</p>	<p>See definitions: "significant vegetation removal"</p>	<p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>

STATE RULE (WAC) REQUIREMENTS	LOCATION	Page 266 COMMENTS
Water Quality. WAC 173-26-221(6)		
Provisions protect against adverse impacts to water quality and storm water quantity and ensure mutual consistency between SMP and other regulations addressing water quality. WAC 173-26-221(6)	3.B.12.b-c	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
SHORELINE MODIFICATIONS		
SMP: (a) allows structural shoreline modifications only where demonstrated to be necessary to support or protect an allowed primary structure or a legally existing shoreline use that is in danger of loss or substantial damage or are necessary for mitigation or enhancement; (b) limits shoreline modifications in number and extent; (c) allows only shoreline modifications that are appropriate to the specific type of shoreline and environmental conditions for which they are proposed; (d) gives preference to those types of shoreline modifications that have a lesser impact on ecological functions. Policies promote "soft" over "hard" shoreline modification measures (f) incorporates all feasible measures to protect ecological shoreline functions and ecosystem-wide processes as modifications occur; (g) requires mitigation sequencing. WAC 173-26-231(2); WAC 173-26-231(3)(a)(ii) and (iii);	4.C.1.C.1-7 ALSO 4.C.2.A-C (SPECIFICALLY 4.C.2.C.4-9) ALSO 3.B.4	SEE SPECIFIC COMMENTS BELOW:
Shoreline Stabilization. WAC 173-26-231(3)(a)		
<p>Definition: structural and nonstructural methods to address erosion impacts to property and dwellings, businesses, or structures caused by natural processes, such as current, flood, tides, wind, or wave action. WAC 173-26-231(3)(a)(i)</p> <p>Definition of new stabilization measures include enlargement of existing structures. WAC 173-26-231(3)(a)(iii)(C), last bullet; WAC 173-26-231(3)(a)(iii)(B)(I), 5th bullet)</p>	4.C.2.c.4-6	<p><u>Not Compliant:</u></p> <p><u>(Ecology 11-2-2010) Section 4.C.2.a (Applicability) is not consistent with this Guideline section. Specifically, WAC 173-26-231(3)(a)(i) does not include a reference to "manmade process", which should be removed from this section of the SMP.</u></p> <p>RESPONSE: This reference was removed.</p>

<p>Attachment 2 STATE RULE (WAC) REQUIREMENTS</p>	<p>LOCATION Page 267</p>	<p>COMMENTS</p>
<p>Standards setting forth circumstances under which shoreline alteration is permitted, and for the design and type of protective measures and devices. WAC 173-26-231(3)(a)(ii)</p>	<p>y sub4.C.2.c, all regulations</p>	<p>Not Compliant:</p> <p>Policy 4.C.2.b.2 including the general reference to "existing development" is not consistent with the SMP Guidelines. Structural stabilization should only be considered to prevent damage to existing 'primary structures' or 'primary uses', which may not include all "existing development" as currently drafted in the SMP.</p> <p>Requirement:</p> <p>Policy 4.C.2.b.2 and Regulation 4.C.2.c.4, should be amended by substituting the reference to "...existing development..." with "primary structure" or similar language consistent with the SMP Guidelines</p> <p><u>(Ecology 11-2-2010): This comment should really be applied to the whole Shoreline Stabilization section including all references to "development" as opposed to a more specific "primary structure" reference as required by the SMP-Guidelines. "Development" is defined within the SMP, wich is not consistent with the "primary structure" reference in the Guidelines.</u></p> <p><u>Therefore, references to "development" in this section should be replaced with "primary structure".</u></p> <p>RESPONSE: Language updated.</p>
<p>New development (including newly created parcels) required to be designed and located to prevent the need for future shoreline stabilization, based upon geotechnical analysis.</p> <p>New development on steep slopes and bluffs required to be set back to prevent need for future shoreline stabilization during life of the project, based upon geotechnical analysis.</p> <p>New development that would require shoreline stabilization which causes significant impacts to adjacent or down-current properties and shoreline areas is prohibited. WAC 173-26-231(3)(a)(iii)(A)</p>	<p>4.C.2.c.1-3</p>	<p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>

STATE RULE (WAC) REQUIREMENTS	LOCATION	COMMENTS
<p>New structural stabilization measures are not allowed except when necessity is demonstrated. Specific requirements for <i>how to demonstrate need</i> are established for:</p> <p>(I) existing primary structures; (II) new non-water-dependent development including Single Family Residences; (III) water-dependent development; and (IV) ecological restoration/toxic clean-up remediation projects. WAC 173-26-231(3)(a)(iii)(B)</p>	4.C.2.c.6	<p>Not Compliant:</p> <p>The referenced regulation (4.C.2.c.6) should be amended by substituting the reference to "...existing development..." with "primary structure" or similar language consistent with the SMP Guidelines</p> <p>RESPONSE: Language updated.</p>
<p>Replacement of existing stabilization structures is based on demonstrated need. Waterward encroachment of replacement structure only allowed for residences occupied prior to January 1, 1992, or for soft shoreline stabilization measures that provide restoration of ecological functions. WAC 173-26-231(3)(a)(iii)(C)</p>	4.C.2.c.12-13	<p>Not Compliant:</p> <p>See comments above related to the existing SMP's incorrect reference to "existing development" as a justification for protection. Further the SMP-Guidelines define "replacement" as "new" stabilization for which a demonstration of need for protection of a primary structure is required</p> <p>RESPONSE: Language updated.</p>
<p>Geotechnical reports prepared to demonstrate need include estimates of rate of erosion and urgency (damage within 3 years) and evaluate alternative solutions. WAC 173-26-231(3)(a)(iii)(D)</p>	4.C.2.c.6	<p>Not Compliant:</p> <p>The referenced provision does not appear to provide any Geotechnical Report criteria.</p> <p>Further, in order to consider new or expanded hard armored structures, the SMP must include a standard requiring that a Geotechnical professional demonstrate that erosion rates projected over the next 3-year would result in damage to an existing primary structure</p> <p>RESPONSE: Language updated.</p>

STATE RULE (WAC) REQUIREMENTS	LOCATION	Page 269 COMMENTS
Shoreline stabilization structures are limited to the minimum size necessary. WAC 173-26-231(3)(a)(iii)(E)	4.C.2.c.8	Not Compliant: Regulation 4.C.2.c.13 is not consistent with this SMP-Guideline requirement. Placement of a new bulkhead adjacent to (seaward or upland) to an existing bulkhead is not replacement, but rather would be considered expansion of the existing bulkhead. Replacement of an existing bulkhead should include removal of the existing bulkhead and replacement with a new shoreline measure consistent with the SMP, which may not be a hard-armored bulkhead RESPONSE: We've added language to clarify that this is only for clear exceptions.
Public access required as part of publicly financed shoreline erosion control measures. WAC 173-26-231(3)(a)(iii)(E)	3.B.7.c.1	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Impacts to sediment transport required to be avoided or minimized. WAC 173-26-231(3)(a)(iii)(E)	4.C.2.c.8	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Piers and Docks. WAC 173-26-231(3)(b)		
New piers and docks: allowed only for water-dependent uses or public access restricted to the minimum size necessary to serve a proposed water-dependent use. permitted only when specific need is demonstrated (except for docks accessory to single-family residences). Note: Docks associated with single family residences are defined as water dependent uses provided they are designed and intended as a facility for access to watercraft. WAC 173-26-231(3)(b)	4.C.3.c.1, .18	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
When permitted, new residential development of more than two dwellings required to provide joint use or community docks, rather than individual docks. WAC 173-26-231(3)(b)	4.C.3.c.18(c) and .19	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.

STATE RULE (WAC) REQUIREMENTS	LOCATION	COMMENTS
<p>Design and construction of all piers and docks required to avoid, minimize and mitigate for impacts to ecological processes and functions and be constructed of approved materials. WAC 173-26-231(3)(b)</p>	<p>4.C.3.c.1, .7-13, .20</p>	<p>Compliant:</p> <p>The Master Program appear generally consistent with this SMP-Guideline requirement.</p> <p>Suggestion: Replacement pier/dock standards beginning with standard 4.C.3.c.22 could be enhanced by also limiting pier width to 4-6 feet within 30-feet of OHWM similar to the SMP's new pier/dock standards.</p>
Fill. WAC 173-26-231(3)(c)		
<p>Definition of "fill" consistent with WAC 173-26-020(14)</p>	<p>4.C.4.a</p>	<p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
<p>Location, design, and construction of all fills protect ecological processes and functions, including channel migration. WAC 173-26-231(3)(c)</p>	<p>4.C.4.c.1-4</p>	<p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
<p>Fill waterward of the OHWM allowed only by shoreline conditional use permit, for:</p> <ul style="list-style-type: none"> water-dependent use; public access; cleanup and disposal of contaminated sediments as part of an interagency environmental clean-up plan; disposal of dredged material in accordance with DNR Dredged Material Management Program; expansion or alteration of transportation facilities of statewide significance currently located on the shoreline (if alternatives to fill are shown not feasible); mitigation action, environmental restoration, beach nourishment or enhancement project. WAC 173-26-231(3)(c) 	<p>4.C.4.c.7</p>	<p>Fill is permitted for ecological restoration only.</p> <p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
Breakwaters, Jetties, and Weirs. WAC 173-26-231(3)(d)		
<p>Structures waterward of the ordinary high-water mark allowed only for water-dependent uses, public access, shoreline stabilization, or other specific public purpose. WAC 173-26-231(3)(d)</p>	<p>New structures are not permitted.</p>	<p>There is an existing weir to control lake level.</p> <p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
<p>Shoreline conditional use permit required for all structures except protection/restoration projects. WAC 173-26-231(3)(d)</p>	<p>Not permitted.</p>	<p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>

Attachment 2 STATE RULE (WAC) REQUIREMENTS	LOCATION	COMMENTS
Protection of critical areas and appropriate mitigation required. WAC 173-26-231(3)(d)	Not permitted.	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Dunes Management. WAC 173-26-231(3)(e)		
Development setbacks from dunes prevent impacts to the natural, functional, ecological, and aesthetic qualities of the dunes. WAC 173-26-231(3)(e)	N/A	
Dune modifications allowed only when consistent with state and federal flood protection standards and result in no net loss of ecological processes and functions. WAC 173-26-231(3)(e)	N/A	
Dune modification to protect views of the water shall be allowed only on properties subdivided and developed prior to the adoption of the master program and where the view is completely obstructed for residences or water-enjoyment uses and where it can be demonstrated that the dunes did not obstruct views at the time of original occupancy. WAC 173-26-231(3)(e)	N/A	
Dredging and Dredge Material Disposal. WAC 173-26-231(3)(f)		
Dredging and dredge material disposal avoids or minimizes significant ecological impacts. Impacts which cannot be avoided are mitigated. WAC 173-26-231(3)(f)	4.C.5.d.1-4	Compliant: The Master Program appears consistent with this SMP-Guideline requirement. Note: Regulation 4.C.5.d.2 references "marine habitat", which is assumed to be a mistake as the SMA jurisdiction of Lake Stevens does not involve any marine waters.
New development siting and design avoids the need for new and maintenance dredging. WAC 173-26-231(3)(f)	4.C.5.d.11	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Dredging to establish, expand, relocate or reconfigure navigation channels allowed only where needed to accommodate existing navigational uses and then only when significant ecological impacts are minimized and when mitigation is provided. WAC 173-26-231(3)(f)	4.C.5.c.1 and 4.C.5.d.10	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Maintenance dredging of established navigation channels and basins restricted to maintaining previously dredged and/or existing authorized location, depth, and width. WAC 173-26-231(3)(f)	4.C.5.d.12	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Dredging for fill materials prohibited except for projects associated with MTCA or CERCLA habitat restoration, or any other significant restoration effort approved by a shoreline CUP. Placement of fill must be <i>waterward</i> of OHWM. WAC 173-26-231(3)(f)	4.C.5.d.10	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.

STATE RULE (WAC) REQUIREMENTS	LOCATION	COMMENTS
<p>Uses of dredge material that benefits shoreline resources are addressed. If applicable, addressed through implementation of regional interagency dredge material management plans or watershed plan. WAC 173-26-231(3)(f)</p>	4.C.5.d.13-14	<p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
<p>Disposal within river channel migration zones discouraged, and in limited instances when allowed, require CUP. (Note: not intended to address discharge of dredge material into the flowing current of the river or in deep water within the channel where it does not substantially effect the geo-hydrologic character of the channel migration zone). WAC 173-26-231(3)(f)</p>	4.C.5.d.17	<p>Such disposal is highly unlikely.</p> <p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
Shoreline Habitat and Natural Systems Enhancement Projects. WAC 173-26-231(3)(g)		
<p>Provisions that foster habitat and natural system enhancement projects, provided the primary purpose is restoration of the natural character and functions of the shoreline, and only when consistent with implementation of the restoration plan developed pursuant to WAC 173-26-201(2)(f)</p>	4.C.6.c.1-4	<p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
SPECIFIC SHORELINE USES		
Agriculture. WAC 173-26-241(3)(a)		
<p>Use of agriculture related terms is consistent with the specific meanings provided in WAC 173-26-020. WAC 173-26-241(3)(a)(ii) and (iv)</p>	5.C.2.a	<p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
<p>Provisions address new agricultural activities, conversion of agricultural lands to other uses, and other development not meeting the definition of agricultural activities.</p> <p>Provisions assure that development in support of agricultural uses is: (A) consistent with the environment designation; and (B) located and designed to assure no net loss of ecological functions and not have a significant adverse impact on other shoreline resources and values. WAC 173-26-241(3)(a)(ii) & (v)</p>	5.C.2.c	<p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
<p>Shoreline substantial development permit is required for all agricultural development not specifically exempted by the provisions of RCW 90.58.030(3)(e)(iv)</p>	5.C.2.a	<p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
<p>Conversion of agricultural land to non-agricultural uses is consistent with the environment designation, and regulations applicable to the proposed use do not result in a net loss of ecological functions. WAC 173-26-241(3)(a)(vi)</p>	N/A	
Aquaculture. WAC 173-26-241(3)(b)		
<p>Location and design requirements for aquaculture facilities avoid: loss of ecological functions, impacts to eelgrass and macroalgae, significant conflict with navigation and water-dependent uses, the spreading of disease, introduction of non-native species, or impacts to shoreline aesthetic qualities. Impacts to functions are mitigated. WAC 173-26-241(3)(b)</p>	N/A	

Attachment 2 STATE RULE (WAC) REQUIREMENTS	LOCATION Page 273	COMMENTS
Boating Facilities. WAC 173-26-241(3)(c)		
Definition: Boating facility standards do not apply to docks serving four or fewer SFRs. WAC 173-26-241(3)(c)	5.C.3.a	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Boating facilities restricted to suitable locations . WAC 173-26-241(3)(c)(i)	5.C.3.c.3-4	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Provisions ensuring health, safety, and welfare requirements are met. WAC 173-26-241(3)(c)(ii)	5.C.3.c.1	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Provisions to avoid or mitigate aesthetic impacts . See WAC 173-26-241(3)(c)(iii)	5.C.3.c.8, .10	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Public access required in new boating facilities. WAC 173-26-241(3)(c)(iv)		Public access to the small marinas on Lake Stevens would not provide a significant public benefit, and new marina opportunities are resstricted. Discuss RESPONSE: The public access regulations have been updated for clarity.
Impacts of live-aboard vessels are limited. WAC 173-26-241(3)(c)(v)		Live-aboards are not an issue on Lake Stevens. Not Compliant: Please describe why Live-aboards are not an issue. Are live-aboards prohibited? RESPONSE: Added language to prohibit live aboards
Provisions assuring no net loss of ecological functions as a result of development of boating facilities while providing public recreational opportunities. WAC 173-26-241(3)(c)(vi)	5.C.3.c.3-5	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Navigation rights are protected. WAC 173-26-241(3)(c)(vii)	5.C.3.c.2	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.

Attachment 2 STATE RULE (WAC) REQUIREMENTS	LOCATION Page 274	COMMENTS
Extended moorage on waters of the state without a lease or permission is restricted, and mitigation of impacts to navigation and access is required. WAC 173-26-241(3)(c)(viii)	5.C.3.c.1	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Commercial Development. WAC 173-26-241(3)(d)		
Preference given first to water-dependent uses, then to water-oriented commercial uses. WAC 173-26-241(3)(d)	5.C.4.c.2	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Water-enjoyment and water-related commercial uses required to provide public access and ecological restoration where feasible and avoid impacts to existing navigation, recreation, and public access. WAC 173-26-241(3)(d)	5.C.4.c.4	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
New non-water-oriented commercial uses prohibited unless they are part of a mixed-use project, navigation is severely limited, and the use provides a significant public benefit with respect to SMA objectives. WAC 173-26-241(3)(d)	5.C.4.c.2	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Non-water-dependent commercial uses over water prohibited except in existing structures, and where necessary to support water-dependent uses. WAC 173-26-241(3)(d)	5.B use chart	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Forest Practices. WAC 173-26-241(3)(e)		
Forest practices not covered by the Forest Practices Act, especially Class IV-General forest practices involving conversions to non-forest use result in no net loss of ecological functions and avoid impacts to navigation, recreation and public access. WAC 173-26-241(3)(e)	N/A	
SMP limits removal of trees on shorelines of statewide significance (RCW 90.58.150). Exceptions to this standard require shorelines conditional use permit. WAC 173-26-241(3)(e)	N/A	

STATE RULE (WAC) REQUIREMENTS	LOCATION	Page 275 COMMENTS
Industry. WAC 173-26-241(3)(f)		
<p>Preference given first to water-dependent uses, then to water-oriented industrial uses. WAC 173-26-241(3)(f)</p>	5.B use chart	<p>There are no sites where industry has access to navigable waters suitable for that purpose.</p> <p>Not Compliant:</p> <p>Please describe how this SMP-Guideline standard is achieved? If, Industrial uses are allowed by the SMP, then preference to water-dependent uses should be integrated into this section</p> <p>RESPONSE: On Little Pilchuck and Catherine Creeks, we do not want to encourage water dependent industry because the creeks are sensitive, non-navigable waterways with 160' setbacks. In this case, we feel it is better to protect the shoreline. We added a policy to address this.</p>
<p>Location, design, and construction of industrial uses and redevelopment required to assure no net loss of ecological functions. WAC 173-26-241(3)(f)</p>	5.C.4.b.1	<p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
<p>Industrial uses and redevelopment encouraged to locate where environmental cleanup and restoration can be accomplished. WAC 173-26-241(3)(f)</p>	N/A	<p>Industrial uses must be set back 160' from the shoreline. See 5.B development standards matrix</p> <p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>

STATE RULE (WAC) REQUIREMENTS	LOCATION	COMMENTS
<p>Public access required unless such a requirement would interfere with operations or create hazards to life or property. WAC 173-26-241(3)(f)</p>	N/A	<p>Not Compliant:</p> <p>Please describe how this SMP-Guideline standard is achieved? If, Industrial uses are allowed by the SMP, then either the SMP should require some form of public access or provide criteria that isolates justified safety concerns and includes an alternative mechanism to contribute Shoreline Oriented public benefits to the SMP</p> <p>RESPONSE: In this case, public access is not desirable to Little Pilchuck or Catherine Creek. There are no trails in these locations and we feel it is better to protect the shorelines. We did add language to require ecological restoration as the significant public benefit .</p>
<p>New non-water-oriented industrial uses prohibited unless they are part of a mixed-use project, navigation is severely limited, and the use provides a significant public benefit with respect to SMA objectives. WAC 173-26-241(3)(f)</p>	5.C.4.b.1	<p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
In-Stream Structures. WAC 173-26-241(3)(g)		
<p>Definition: structure is waterward of the ordinary high water mark and either causes or has the potential to cause water impoundment or the diversion, obstruction, or modification of water flow. WAC 173-26-241(3)(g)</p>	5.C.6.a	<p>Requires a CUP.</p> <p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
<p>In-stream structures protect and preserve ecosystem-wide processes, ecological functions, and cultural resources, including, fish and fish passage, wildlife and water resources, shoreline critical areas, hydrogeological processes, and natural scenic vistas. WAC 173-26-241(3)(g)</p>	5.C.6.c.1	<p>Compliant:</p> <p>The Master Program appears consistent with this SMP-Guideline requirement.</p>
Mining. WAC 173-26-241(3)(h)		
<p>Policies and regulations for new mining projects:</p> <ul style="list-style-type: none"> require design and operation to avoid and mitigate for adverse impacts during the course of mining and reclamation achieve no net loss of ecological functions based on required final reclamation give preference to proposals that create, restore or enhance habitat for priority species are coordinated with state Surface Mining Reclamation Act requirements. assure subsequent use of reclaimed sites is consistent with environment designation and SMP standards. <p>See WAC 173-26-241(3)(h)(ii)(A) – (C)</p>	N/A	Not permitted.

Attachment 2 STATE RULE (WAC) REQUIREMENTS	LOCATION Page 277	COMMENTS
Mining waterward of OHWM is prohibited unless: (I) Removal of specified quantities of materials in specified locations will not adversely impact natural gravel transport; (II) The mining will not significantly impact priority species and the ecological functions upon which they depend; and (III) these determinations are integrated with relevant SEPA requirements. WAC 173-26-241(3)(h)(ii)(D)	N/A	
Renewal, extension, or reauthorization of in-stream and gravel bar mining activities require review for compliance with these new guidelines requirements. WAC 173-26-241(3)(h)(ii)(D)(IV)	N/A	
Mining within the Channel Migration Zone requires a shoreline conditional use permit. WAC 173-26-241(3)(h)(ii)(E)	N/A	
Recreational Development. WAC 173-26-241(3)(i)		
Definition includes both commercial and public recreation developments. WAC 173-26-241(3)(i)	5.C.7.a	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Priority given to recreational development for access to and use of the water. WAC 173-26-241(3)(i)	5.C.7.c.1	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Location, design and operation of facilities are consistent with purpose of environment designations in which they are allowed. WAC 173-26-241(3)(i)	See 5.B. use and development standards charts	TBD.
Recreational development achieves no net loss of ecological processes and functions. WAC 173-26-241(3)(i)	N/A	Will be evaluated in the Cumulative Impact Assessment. TBD.
Residential Development. WAC 173-26-241(3)(j)		
Definition includes single-family residences, multifamily development, and the creation of new residential lots through land division. WAC 173-26-241(3)(j)	5.C.8.a	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Single-family residences identified as a priority use only when developed in a manner consistent with control of pollution and prevention of damage to the natural environment. WAC 173-26-241(3)(j)	5.C.8.a	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
No net loss of ecological functions assured with specific standards for setback of structures sufficient to avoid future stabilization, buffers, density, shoreline stabilization, and on-site sewage disposal. WAC 173-26-241(3)(j)		Will be evaluated in the Cumulative Impact Assessment. TBD-See Questions related to CIA.

STATE RULE (WAC) REQUIREMENTS	LOCATION	COMMENTS
New over-water residences and floating homes prohibited. Appropriate accommodation for existing floating or over-water homes. WAC 173-26-241(3)(j)	5.B. use charts	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
New multiunit residential development (including subdivision of land for more than four parcels) required to provide community and/or public access in conformance to local public access plans. WAC 173-26-241(3)(j)	3.B.7.c.1-2	TBD-based on review of CIA.
New (subdivided) lots required to be designed, configured and developed to: (i) Prevent the loss of ecological functions at full build-out; (ii) Prevent the need for new shoreline stabilization or flood hazard reduction measures; and (iii) Be consistent with applicable SMP environment designations and standards. WAC 173-26-241(3)(j)	5.C.8.c.6	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Transportation Facilities. WAC 173-26-241(3)(k)		
Proposed transportation and parking facilities required to plan, locate, and design where routes will have the least possible adverse effect on unique or fragile shoreline features, will not result in a net loss of shoreline ecological functions or adversely impact existing or planned water dependent uses. WAC 173-26-241(3)(k)	5.C.9.c.1-6	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Circulation system plans include systems for pedestrian, bicycle, and public transportation where appropriate. WAC 173-26-241(3)(k)	5.C.9.c.8	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Parking allowed only as necessary to support an authorized shoreline use and which minimize environmental and visual impacts of parking facilities. WAC 173-26-241(3)(k)	3.C.6.c.1-8	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Utilities. WAC 173-26-241(3)(l)		
Design, location and maintenance of utilities required to assure no net loss of ecological functions. WAC 173-26-241(3)(l)		Will be evaluated in the Cumulative Impact Assessment. TBD-based on review of CIA.
Utilities required to be located in existing rights-of-ways whenever possible. WAC 173-26-241(3)(l)	5.C.10.c.1-4, .6	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.
Utility production and processing facilities and transmission facilities required to be located outside of SMA jurisdiction , unless no other feasible option exists. WAC 173-26-241(3)(l)	5.C.10.c.2	Compliant: The Master Program appears consistent with this SMP-Guideline requirement.

STATE RULE (WAC) REQUIREMENTS	LOCATION	Page 279 COMMENTS
SMP ADMINISTRATIVE PROVISIONS		
The statement: "All proposed uses and development occurring within shoreline jurisdiction must conform to chapter 90.58 RCW, the Shoreline Management Act and this master program" whether or not a permit is required. WAC 173-26-191(2)(a)(iii)(A)	<u>(Ecology 11-2-2010) Note: Comments for this section are in reference to a Chapter 7 draft dated 8/31/2010.</u>	<u>Compliant:</u> <u>(Ecology 11-2-2010) A statement consistent with this Guideline requirement is listed in Part A of Chapter 7 (page 1).</u>
Administrative provisions ensure permit procedures and enforcement are conducted in a manner consistent with relevant constitutional limitations on regulation of private property. WAC 173-26-186(5) and WAC 191(2)(a)(iii)(A)		<u>Question:</u> <u>(Ecology 11-2-2010) A statement consistent with this requirement was not found within Chapter 7.</u> RESPONSE: Added 7Ac to include statement
Identification of specific uses and development that require a shoreline conditional use permit (CUP) . Standards for reviewing CUPs and variances conform to WAC 173-27. WAC 191(2)(a)(iii)(B) and WAC 173-26-241(2)(b)		<u>Compliant:</u> <u>(Ecology 11-2-2010) Section 4.C.2.a (Applicability) is not consistent with this Guideline section.</u> RESPONSE: Replaced language in quotes in third paragraph under soft structures to be exactly the language from WAC 173-26-241(2)(b)(ii)(B).

<div>Attachment 2</div> <div>STATE RULE (WAC) REQUIREMENTS</div>	<div>LOCATION</div> <div>Page 280</div>	COMMENTS
<p>Administrative, enforcement, and permit review procedures conform to the SMA and state rules (see RCW 90.58.140, 143, 210 and 220 and WAC 173-27). WAC 191(2)(a)(iii)(C), WAC 173-26-201(3)(d)(vi)</p>		<p><u>Not Compliant:</u></p> <p><u>(Ecology 11-2-2010) Chapter 7 Section K (Enforcement) references "Title 17 LSMC as amended". If the City chooses to reference this ordinance, it will then be considered part of the SMP, which will require a SMP amendment including review and approval from Ecology for any future changes. Also, the reference cannot state "as amended", similar to the reference to the Critical Areas Ordinance, if the City decides to reference "Title 17 LSMC" then the reference will need to include the adopting ordinance number and date, for which (as explained above) this ordinance would then be considered part of the SMP.</u></p> <p><u>Alternatively, the City could limit the reference to the specific "Enforcement" section of "Title 17", therefore limiting just those specific sections as part of the SMP, or the City could not reference Title 17 and just bring the relevant Enforcement text into Chapter 7 (Section K) of the SMP.</u></p> <p>RESPONSE: Chapter 7 Section K(3)(c) was modified to reference WAC 173-27-240 through .310</p>

STATE RULE (WAC) REQUIREMENTS	LOCATION	COMMENTS
<p>Mechanism for tracking, and periodically evaluating the cumulative effects of all project review actions in shoreline areas. WAC 173-26-191(2)(a)(iii)(D)</p>		<p><u>Not Compliant/Suggestion:</u></p> <p><i><u>(Ecology 11-2-2010) Chapter 7 Section H provides a very general statement that the City will keep files on shoreline permits. This standard is intended to provide a good opportunity for the City to take advantage of their existing update efforts by suggesting No Net Loss indicators that are relevant to the City and should be tracked through implementation (permitting) over the seven years prior to the next review. This is an opportunity for the City to facilitate the future seven year review by ensuring that their permit materials are collecting relevant information that can be used to more easily evaluate No Net Loss expectations. A bit of effort in this task could allow the City to integrate adaptive management into their SMP.</u></i></p> <p>RESPONSE: Added language from the restoration plan (7.2.1) for collecting and tracking information.</p>
<p>SMP definitions are consistent with all definitions in WAC 173-26-020, and other relevant WACs.</p>	<p>Chapter 6</p>	<p>Compliant:</p> <p><i>(Ecology 11-2-2010) The definitions listed in Chapter 6 appear generally consistent with WAC 173-26-020.</i></p> <p>RESPONSE: Updated and added definitions to include relevant Critical Areas definitions.</p>
MISCELLANEOUS UPDATES		
	<p>Chapter 1</p>	<p>Added a Public Process section and a 'User's Guide' that points readers to all applicable code sections.</p>

APPENDIX B

CRITICAL AREAS REGULATIONS WITHIN SHORELINE JURISDICTION

Sections:

Part ~~II~~. Purpose and Intent

~~14.88.0101.A~~ Purpose and Intent

Part ~~III~~2. General Provisions

~~14.88.2002.A~~ Applicability

~~14.88.2102.B~~ Regulated Activities

~~14.88.2202.C~~ Allowed Activities

~~14.88.230—Compliance~~

~~14.88.235—Best Available Science~~

~~14.88.2402.D~~ Classification as a Critical Area

~~14.88.250—Procedures~~

~~14.88.2602.E~~ Submittal Requirements

~~14.88.2702.F~~ Site/Resource-Specific Reports

~~14.88.2752.G~~ Mitigation/Enhancement Plan Requirements

~~14.88.2772.H~~ Mitigation Monitoring

~~14.88.2782.I~~ Bonding (Security Mechanism)

~~14.88.2832.J~~ Pesticide Management

~~14.88.2852.K~~ Building Setbacks

~~14.88.2872.L~~ Fencing and Signage

~~14.88.2902.M~~ Dedication of Open Space/Native Growth Protection Area

~~14.88.2952.N~~ Permanent Protection for Streams, Wetlands and Buffers

~~14.88.2972.O~~ Density Transfers on Sites Less than Five Acres

~~14.88.2982.P~~ Innovative Development Design

~~14.88.3002.Q~~ Dedication of Land and/or Easements in Lieu of Park Mitigation

~~14.88.310—Demonstration of Denial of All Reasonable Economic Uses~~

~~14.88.320—Allowance of Regulated Use in a Critical Area Where Denial of All Economic Use is Demonstrated~~

~~14.88.330—Nonconforming Activities~~

~~14.88.3402.R~~ Assessment Relief

Part ~~IV~~3. Fish and Wildlife Conservation Areas

~~14.88.4003.A~~ Classification

~~14.88.4103.B~~ Determination of Boundary

~~14.88.415—Species/Habitats of Local Importance~~

- [14.88.4203.C](#) Allowed Activities
- [14.88.4303.D](#) Requirements
- [14.88.4403.E](#) Mitigation

Part ~~V~~4. Frequently Flooded Areas

- [14.88.5004.A](#) Classification
- [14.88.5104.B](#) Determination of Boundary
- [14.88.5204.C](#) Allowed Activities
- [14.88.5304.D](#) Requirements
- [14.88.5404.E](#) Mitigation

Part ~~VI~~5. Geologically Hazardous Areas

- [14.88.6005.A](#) Classification
- [14.88.6105.B](#) Determination of Boundary
- [14.88.6205.C](#) Allowed Activities
- [14.88.6305.D](#) Geological Assessment Requirements
- [14.88.6405.E](#) Setback Buffer Requirements
- [14.88.6505.F](#) Allowed Alterations
- [14.88.6605.G](#) Prohibited Alterations
- [14.88.6705.H](#) Mitigation

Part ~~VII~~6. Wetlands

- [14.88.8006.A](#) Classification
- [14.88.8106.B](#) Determination of Boundary
- [14.88.8206.C](#) Allowed Activities
- [14.88.8306.D](#) Requirements
- [14.88.8406.E](#) Mitigation

Part 1. Purpose and Intent

1.A. Purpose and Intent.

The purpose of this ~~chapter~~appendix is to designate, classify, and protect the critical areas within shoreline jurisdiction of the Lake Stevens community by establishing regulations and standards for development and use of properties which contain or adjoin shoreline jurisdictional critical areas for protection of the public health, safety, and welfare. The purpose and intent of this ~~chapter~~appendix is also to ensure that there is no net loss of the acreage or functions and values of shoreline jurisdictional critical areas regulated by this ~~chapter~~appendix. The regulations in this appendix are fully enforceable and considered part of the SMP

(a) A project proponent shall make all reasonable efforts to avoid and minimize impacts to shoreline jurisdictional critical areas and buffers in the following sequential order of preference (WAC 173-26-201(2)(e)):

- (1) Avoiding impacts altogether by not taking a certain action or parts of an action; or
- (2) When avoidance is not possible, minimizing impacts by limiting the degree or magnitude of the action and its implementation, using appropriate technology, or by taking affirmative steps, such as project redesign, relocations, or timing, to avoid or reduce impacts and mitigating for the affected functions and values of the shoreline jurisdictional critical area; and

(3) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.

(34) Reducing or eliminating impacts over time by preservation and maintenance operations during the life of the action.

(45) Compensating for unavoidable impacts by replacing, enhancing or providing substitute resources or environments.

(6) Monitoring the impact and the compensation projects and taking appropriate corrective measures (see WAC 173-26-201(2)(e)(i)(F) for more details).

(b) Protect the public from personal injury, loss of life, or property damage due to flooding, erosion, landslides, seismic events, or soil subsidence.

(c) Protect against publicly financed expenditures due to the misuse of shoreline jurisdictional critical areas which cause:

- (1) Unnecessary maintenance and replacement of public facilities;
- (2) Publicly funded mitigation of avoidable impacts;
- (3) Cost for public emergency rescue and relief operations where the causes are avoidable;
- (4) Degradation of the natural environment.

(d) Protect aquatic resources.

(e) Protect unique, fragile, and valuable elements of the environment, including wildlife and its habitat.

(f) Alert appraisers, assessors, owners, potential buyers, or lessees to the development limitations of environmentally sensitive areas.

(g) Provide City officials with sufficient information to adequately protect shoreline jurisdictional critical areas when approving, conditioning, or denying public or private development proposals.

(h) Give guidance to the development of Comprehensive Plan policies in regard to the natural systems and environment of the Lake Stevens Watershed.

- (i) Provide property owners and developers with succinct information regarding the City's requirements for property development.

Part 2. General Provisions

2.A Applicability.

The provisions of this ~~chapter~~ appendix apply to all lands, land uses and development activity in areas of shoreline jurisdiction within the City. No action shall be taken by any person which results in any alteration of any shoreline jurisdictional critical areas except as consistent with the purposes, objectives, and goals of this ~~chapter~~ SMP.

2.B Regulated Activities.

Land use and development activities in shoreline jurisdictional critical areas shall ensure no net loss of critical area and functions. Regulated activities include, but are not limited to, the following activities consistent with WAC 173-26-221(2)(c)(i)(A):

- (4a) The removal, excavation, grading, or dredging of soil, sand, gravel, minerals, organic matter, or material of any kind.
- (2b) The dumping, discharging, or filling with any material, including discharges of storm water and domestic, commercial, or industrial wastewater.
- (3c) The draining, flooding, or disturbing of the water level, duration of inundation, or water table.
- (4d) The driving of pilings.
- (5e) The placing of obstructions.
- (6f) The construction, reconstruction, demolition, or expansion of any structure.
- (7g) The destruction or alteration of vegetation in a critical area through clearing, harvesting, shading, intentional burning, or planting of vegetation that would alter the character of a critical area; provided, that these activities are not part of a forest practice governed under Chapter 76.09 RCW and its rules.
- (8h) Activities that result in a significant change of water temperature, a significant change of physical or chemical characteristics of water sources, including quantity, or the introduction of pollutants.
- (i) Other uses or development that results in a significant ecological impact to the physical, chemical, or biological characteristics of wetlands, lakes or streams.
- (j) Activities reducing the functions of buffers.

2.C Allowed Activities.

Unless specifically prohibited elsewhere in this ~~chapter~~appendix or SMP, the following uses are allowed in any shoreline jurisdictional critical area; provided, that site/resource-specific reports prepared to describe the environmental limitations of and proposed mitigation for the site, and show how no net loss of area and functions, including lost time when the critical area does not perform the function. The report shall be submitted, reviewed, and approved by the City prior to permit issuance or land use approval. In addition, a Hydraulic Project Approval may be required from the Department of Fish and Wildlife before any activity takes place in the critical area:

(a) Education, scientific research, and construction and use of nature trails; provided, that they are proposed only within the outer 25 percent of the wetland buffers, except that trails may be located within the remainder of the critical area buffer when it is demonstrated through the site/resource-specific report that:

- (1) No other alternative for the trail location exists which would provide the same educational and/or scientific research opportunities; and
- (2) The critical area functions and values will not be diminished as a result of the trail; and
- (3) The materials used to construct the trail will not harm the critical area; and
- (4) Land disturbance is minimized to the greatest extent possible; and
- (5) Where possible, the number of trails allowed in critical area buffers shall be limited.

(b) Navigation aids and boundary markers.

(c) Site investigative work necessary for land use application submittals such as surveys, soil logs, percolation tests and other related activities. In every case, impacts shall be minimized and disturbed areas shall be immediately restored.

(d) Normal maintenance, repair, or operation of existing structures, facilities, or improved areas.

(e) Installation or construction of City road right-of-way; or installation, replacement, operation, repair, alteration, or relocation of all water, natural gas, cable communication, telephone, or other utility lines, pipes, mains, equipment or appurtenances, not including substations or other buildings, only when required by the City and approved by the Planning and Community Development Director and when avoidance of critical areas and impact minimization has been addressed during the siting of roads and other utilities and a detailed report/mitigation plan ~~is~~ submitted, reviewed, and approved by the City prior to permit issuance or land use approval and all other agency approvals have been issued.

(f) Minor expansion of uses or structures existing at the time of adoption of this code, and which are in compliance with all ~~other chapters of this title~~development regulations; provided,

that the applicant obtains all required local, State, and Federal permits, which may include, but not limited, to a Department of Fish and Wildlife Hydraulic Permit and a Clean Water Act 404 Permit and the expansion does not create a loss of wetland area and functions nor pose a significant threat to water quality. A site/resource-specific report and mitigation plan shall be prepared to describe the wetland area, function, and water quality and submitted to the City for review and approval prior to permit issuance. For the purposes of this subsection, “minor expansion” refers to an addition to or alteration of a use or structure and shall be limited to a maximum of 1,000 square feet of impervious area.

(g) Stormwater Management Facilities. Where buffers and setbacks are larger than 50 feet and slopes are less than 15 percent, stormwater management facilities, limited to stormwater dispersion outfalls and bioswales, may be allowed within the outer 25 percent of the buffer, when location of such facilities will not degrade the function or values of the wetland.

(h) Emergency Activities. Those activities that are necessary to prevent an immediate threat to public health, safety, or welfare or pose an immediate risk of damage to a primary structure/private property, and that require remedial or preventative action in a time frame too short to allow for compliance with the requirements of this chapter.

2.D Classification as a Critical Area.

Critical areas include fish and wildlife conservation areas, frequently flooded areas, geologically hazardous areas, and associated wetlands. Criteria for classification as a critical area will be listed under the applicable sections of this chapter appendix.

2.E Submittal Requirements.

To enable the City to determine compliance with this chapter appendix, at the time of application submittal, the applicant shall file a SEPA Environmental Checklist (if use is subject to SEPA), a critical area checklist, site/resource-specific reports as specified in Section 2.F, all supplemental application requirements for a shoreline permit described in Chapter 7 of this SMP, and any other pertinent information requested by the Department of Planning and Community Development. Any of these submittal requirements may be waived by the Planning and Community Development Director if it is deemed unnecessary to make a compliance determination.

2.F Site/Resource-Specific Reports.

Unless waived per Section 2.E, all applications for land use or development permits proposed on properties containing or adjacent to shoreline jurisdictional critical areas or their defined setbacks or buffers shall include site/resource-specific reports prepared to describe the environmental limitations of the site. These reports shall conform in format and content to guidelines prepared by the Department of Planning and Community Development, which is hereby authorized to do so. The report shall be prepared by a qualified professional who is a biologist or a geotechnical engineer as applicable with experience preparing reports for the relevant type of critical area.

The report and conclusions present in the shoreline jurisdictional critical area report shall be based on best available science.

2.G Mitigation/Enhancement Plan Requirements.

In the event that mitigation and/or enhancement is required, the Department of Planning and Community Development shall require the applicant to provide a mitigation plan for approval and a performance and maintenance bond in a form and amount acceptable to the City in accordance with Section 2.I. The plan shall provide information on land acquisition, construction, maintenance and monitoring of the replaced shoreline jurisdictional critical area that creates a no-net-loss area in function of the original area in terms of acreage, function, geographic location and setting. The plan shall also include critical areas and buffer impacts and critical areas and proposed buffer areas. All mitigation plans shall include the following items, which shall be submitted by the applicant or a qualified biologist, civil or geotechnical engineer:

- (a) Data collected and synthesized for the critical area and/or the newly restored site;
- (b) Specific goals and objectives describing site function, target species, selection criteria and measures to avoid and minimize impacts which shall include:
 - (1) Avoiding the impact altogether.
 - (2) Reducing or eliminating the impact over time by preservation and maintenance operations.
 - (23) Compensating for the impact by replacing, enhancing, or providing substitute resources or environments.
 - (34) Enhancing significantly degraded wetlands in combination with restoration or creation. Such enhancement should be part of a mitigation package that includes replacing the impacted area by meeting appropriate ratio requirements.
 - (45) Unless it is demonstrated that a higher level of ecological functioning would result from an alternate approach, compensatory mitigation for ecological functions shall be either in-kind and on site, or in-kind and within the same stream reach, subbasin, or drift cell. Mitigation actions shall be conducted within the same subdrainage basin and on the same site as the alteration except as specifically provided for in Sections 3.E and 6.E;
- (c) Performance standards which shall include criteria for assessing goals and objectives;
- (d) Contingency plans which clearly define the course of action or corrective measures needed if performance standards are not met;
- (e) A legal description and a survey prepared by a licensed surveyor of the proposed development site and location of the critical area(s) on the site;

(f) A scaled plot plan that indicates the proposed construction in relation to zoning setback requirements and sequence of construction phases including cross-sectional details, topographic survey data (including percent slope, existing and finished grade elevations noted at two-foot intervals or less), mitigation area, and water table elevation with sufficient detail to explain, illustrate and provide for:

- (1) Soil and substrate conditions, topographic elevations, scope of grading and excavation proposal, erosion and sediment treatment and source controls needed for critical area construction and maintenance;
- (2) Planting plans specifying plant species, types, quantities, location, size, spacing, or density. The planting season or timing, watering schedule, and nutrient requirements for planting, and where appropriate, measures to protect plants from destruction; and
- (3) Contingency or mid-course corrections plan and a minimum five-year monitoring and replacement plan establishing responsibility for removal of exotic and nuisance vegetation and permanent establishment of the critical area and all component parts. The monitoring plan is subject to the provisions of Sections [2.H](#) and [2.I](#);

(g) A clearly defined approach to assess progress of the project, including the measurement of the success of a mitigation project by the presence of native species and an increase in the coverage of native plants over the course of the monitoring period;

(h) The plan must indicate ownership, size, type, and complete ecological assessment including flora, fauna, hydrology, functions, etc., of the critical area being restored or created; and

(i) The plan must also provide information on the natural suitability of the proposed site for establishing the replaced critical area, including water source and drainage patterns, topographic position, wildlife habitat opportunities, and value of existing area to be converted.

2.H Mitigation Monitoring.

(a) All compensatory mitigation projects shall be monitored for the period necessary to establish that performance standards have been met, but in no event for a period less than five years for emergent communities and ten years for scrub-shrub and forested communities following the acceptance of the installation/construction by the ~~Planning and Community Development Director~~Shoreline Administrator.

(b) Monitoring reports on the current status of the mitigation project shall be submitted to the Planning Department. The reports shall be prepared by a qualified consultant and shall include monitoring information on wildlife, vegetation, water quality, water flow, stormwater storage and conveyance, and existing or potential degradation. Reports shall be submitted in accordance with the following schedule:

- (1) At the time of construction;
- (2) Thirty days after planting;
- (3) Early in the growing season of the first year;
- (4) End of the growing season of the first year;
- (5) Twice the second year (at the beginning and end of the growing season); and
- (6) Annually thereafter, to cover a total monitoring period of at least five growing seasons.

(c) The ~~Planning and Community Development Director~~Shoreline Administrator shall have the authority to extend the monitoring and surety period and require additional monitoring reports and maintenance activities beyond the initial five-year monitoring period for any project that ~~involves creation or restoration of forested wetland or buffer communities~~, does not meet the performance standards identified in the mitigation plan, does not provide adequate replacement for the functions and values of the impacted critical area, or otherwise warrants additional monitoring.

2.I Bonding (Security Mechanism).

(a) If the development proposal is subject to compensatory mitigation, the applicant shall enter into an agreement with the City to complete the mitigation plan approved by the City and shall post a mitigation surety to ensure mitigation is fully functional.

(b) The surety shall be in the amount of 150 percent of the estimated cost of the uncompleted actions or the estimated cost of restoring the functions and values of the critical area that are at risk, whichever is greater. The surety shall be based on a detailed, itemized cost estimate of the mitigation activity including clearing and grading, plant materials, plant installation, irrigation, weed management, and all other costs.

(c) The surety shall be in the form of an assignment of funds, bond, security device, or other means acceptable to the City Finance Director in consultation with the City Attorney.

(d) The performance surety authorized by this section shall remain in effect until the City determines, in writing, that the standards bonded for have been met. Once the mitigation installation has been accepted by the ~~Planning Director~~Shoreline Administrator or Public Works Director, the bond may be reduced to 20 percent of the original mitigation cost estimate and shall become a maintenance surety. Said maintenance surety shall generally be held by the City for a period of five years to ensure that the required mitigation has been fully implemented and demonstrated to function, and may be held for longer periods under Section [2.H\(c\)](#).

(e) Depletion, failure, or collection of surety funds shall not discharge the obligation of an applicant to complete required mitigation, maintenance, monitoring, or restoration.

(f) Public development proposals shall be relieved from having to comply with the bonding requirements of this section if public funds have previously been committed for mitigation, maintenance, monitoring, or restoration.

(g) Any failure to satisfy critical area requirements established by law or condition including, but not limited to, the failure to provide a monitoring report within 30 days after it is due or comply with other provisions of an approved mitigation plan shall constitute a default. Upon notice of any default, the City may demand immediate payment of any financial guarantees or require other action authorized by the City code or any other law.

(h) Any funds paid or recovered pursuant to this section shall be used to complete the required mitigation or other authorized action.

(i) The ~~Director~~ Shoreline Administrator may authorize a one-time temporary delay, up to 120 days, in completing mitigation activities when environmental conditions could produce a high probability of failure or significant construction difficulties. The delay shall not create or perpetuate hazardous conditions or environmental damage or degradation. The request for the temporary delay shall include a written justification documenting the environmental constraints that preclude implementation of the mitigation plan and shall include a financial guarantee. The justification shall be verified by the City before approval of any delay.

(j) The provisions of ~~Section LSMC 14.16A.180~~ (Security Mechanisms) shall also apply if necessary to ensure adequate protection of the public interest.

2.J Pesticide Management.

Pesticide use is not allowed in critical areas, including critical area buffers, unless it is determined by the ~~Planning and Community Development Director~~ Shoreline Administrator that there is no alternative to controlling invasive species. If pest control is being proposed as mitigation measures to control invasive species, a pesticide management plan must be submitted to the Planning and Community Development Department. The pesticide management plan must be part of the critical areas report required in Section 2.F for any development proposal, and shall include why there is no other alternative to pesticide use, mitigation of pesticide use, planned application schedules, types of pesticides proposed for use, and a means to prevent or reduce pesticide movement to groundwater and surface water. The report shall be prepared by a qualified specialist.

2.K Building Setbacks.

Unless otherwise provided, buildings and other structures shall be set back a distance of 10 feet from the edges of all critical area buffers or from the edges of all critical areas, if no buffers are required. The following may be allowed in the building setback area:

(a) Uncovered decks;

- (b) Building overhangs, if such overhangs do not extend more than 18 inches into the setback area; and
- (c) Impervious ground surfaces, such as driveways and patios; provided, that such improvements may be subject to water quality regulations as adopted.

2.L Fencing and Signage.

Wetland fencing and signage adjacent to a regulated wetland or stream corridor shall be required.

- (a) Fencing shall be smooth wire or an alternative approved by the ~~Planning and Community Development Director~~Shoreline Administrator.
 - (1) Fencing must be a permanent structure installed in a manner that allows continuous wildlife habitat corridors along critical fish and wildlife areas with a minimum gap of one and one-half feet at the bottom of the fence, and maximum height of three and one-half feet at the top;
 - (2) The fence shall be designed and constructed to clearly demarcate the buffer from the developed portion of the site and to limit access of landscaping equipment, vehicles, or other human disturbances; and
 - (3) No pressure treated posts and rails will be used for signage or fencing.
- (b) Signs designating the presence of a critical area shall be posted along the buffer boundary. The signs shall be posted at a minimum rate of one every 100 lineal feet. Standard details for signage shall be kept on file at the Planning and Community Development Department.

2.M Dedication of Open Space/Native Growth Protection Area.

- (a) In order to protect critical areas, open space easements or tracts, referred to as a native growth protection area, where proposed as mitigation, shall be dedicated to the City.
- (b) Anyone may offer to dedicate a critical area easement or tract and its buffer to the City even if not proposed as mitigation. The ~~Planning and Community Development Director~~Shoreline Administrator shall make a determination regarding the City's acceptance of such a dedication, based on consistency with the goals and policies of the adopted Comprehensive Plan.
- (c) Such easements or tracts shall cover the critical area as delineated by its defined boundaries and buffers.

2.N Permanent Protection for Streams, Wetlands and Buffers.

All streams, ~~and~~ wetlands and mitigation sites under this ~~chapter~~ SMP and their required buffers shall be permanently protected by designating them as native growth protection areas (NGPAs) in accordance with Section 2.M. NGPAs are to be left permanently undisturbed in a substantially

or environmentally enhanced natural state. No clearing, grading, filling, building construction or placement, or road construction is allowed except the following:

- (a) On a case by case basis when supported by a critical areas assessment study, crossings for underground utility lines which utilize the shortest alignment possible and for which no alignment that would avoid such a crossing is feasible;
- (b) Removal of hazardous trees by the property owner, when based on a recommendation by a qualified arborist and an assessment of hazardous tree risk study and when approved by the City.

Existing legally (on-going) established structures, and non-native or ornamental landscaping, including, but not necessarily limited to, gardens, yards, pastures, and orchards, are not required to be designated as NGPAs.

2.O Density Transfers on Sites Less than Five Acres.

On-site density transfers on sites less than five acres may be permitted when [shoreline jurisdictional](#) critical areas are located on the property subject to the following provisions:

- (a) Only the area contained in critical area buffers of the following wetlands is eligible to be used in the density transfer calculation:
 - (1) Category II and III wetlands with a habitat score of less than 20; and
 - (2) Category IV wetlands.
- (b) The development must be proposed to connect to sewer service and sewer service must be available.
- (c) The base density shall be consistent with the densities set forth in Chapter [14.36](#) of the Lake Stevens Municipal Code for the zoning districts. The site density shall be calculated using the area of the subject property divided by the minimum lot size of the applicable zone.
- (d) The overall density of the proposed site may be transferred from the undevelopable portion to the developable part of the site.
- (e) The development shall meet applicable policies, setbacks and other standards of the City except:
 - (1) Lot widths of Chapter [14.48](#) Table V of the Lake Stevens Municipal Code may be modified to not less than 40 feet in the SR and UR zones and not less than 30 feet in the HUR zone;
 - (2) Lot sizes may be modified to not less than 4,000 square feet in the SR and UR zones and not less than 3,000 square feet in the HUR zone;
 - (3) Setbacks of the zone as specified in Chapter [14.48](#) Table V of the Lake Stevens Municipal Code may not be modified when using the density transfer provision;

- (4) The proposed development must be compatible with the character of the area and adjacent uses; and
- (5) The area to which density is transferred must not be constrained by other critical areas.

2.P Innovative Development Design.

A project permit applicant may request approval of an innovative design, which addresses wetland, fish and wildlife habitat conservation area or buffer treatment in a manner that deviates from the standards set forth in Sections [3.A](#) through [3.E](#), Fish and Wildlife Conservation Areas, and Sections [6.A](#) through [6.E](#), Wetlands under a shoreline variance process.

(a) An innovative development design will be considered in conjunction with the primary land use project approval or building permit approval. ~~The Planning and Community Development Director shall develop and adopt administrative procedures as authorized in Section 14.88.250 for review and approval of innovative development design that are consistent with subsection (b) of this section.~~ An applicant may include the innovative development design proposal in the project pre-application review packet for review. The ~~Planning and Community Development Director~~Shoreline Administrator shall give preliminary findings on the pre-application and shall only issue a final decision for the design with the project or building permit approval, whichever occurs first.

(b) The applicant shall demonstrate in a site/resource-specific report required pursuant to Section [2.F](#) how the innovative development design complies with the following requirements:

- (1) The innovative development design will achieve protection equivalent to or better than the treatment of the functions and values of the critical areas that would be obtained by applying the standard prescriptive measures contained in this ~~chapter~~appendix and SMP;
- (2) Applicants for innovative development design are encouraged to consider measures prescribed in guidance documents, such as watershed conservation plans or other similar conservation plans, and low impact stormwater management strategies which address wetlands, fish and wildlife habitat conservation areas or buffer protection consistent with this ~~chapter~~appendix and SMP;
- (3) The innovative development design will not be materially detrimental to the public health, safety or welfare or injurious to other properties or improvements located outside of the subject property; and
- (4) Applicants for innovative development design are encouraged to consider measures prescribed in the Puget Sound Action Team 2005 Technical Guidance Manual for Low Impact Development.

2.Q Dedication of Land and/or Easements in Lieu of Park Mitigation.

The dedication of critical areas and their buffers as open space may not be used for satisfying park mitigation requirements. Park land must be dedicated or fees in lieu of dedication must be paid as set forth in this title. However, if an applicant provides recreation amenities (e.g., trails, bench for wildlife viewing, etc.) in buffers as allowed under this ~~chapter~~appendix, the cost of those amenities may be subtracted from the total park mitigation calculated for a given project with prior approval of the ~~Planning and Community Development Director~~Shoreline Administrator.

2.R Assessment Relief.

The Snohomish County Assessor's office considers critical area regulations in determining the fair market value of land. Any owner of an undeveloped critical area who has dedicated an easement or entered into a perpetual conservation restriction with the City of Lake Stevens or a nonprofit organization to permanently control some or all regulated activities in that portion of land assessed consistent with these restrictions shall be considered for exemption from special assessments to defray the cost of municipal improvements such as sanitary sewers, storm sewers, and water mains.

Part ~~IV~~3. Fish and Wildlife Conservation Areas

3.A Classification.

Fish and wildlife conservation areas include:

- (a) Lands containing priority habitats and species, including plant and/or animal species listed on Federal or State threatened or endangered species lists.
- (b) Naturally occurring ponds under 20 acres and their submerged aquatic beds that provide fish or wildlife habitat. These do not include ponds deliberately designed and created from dry sites such as canals, detention facilities, waste-water treatment facilities, farm ponds, temporary construction ponds (of less than three years duration), and landscape amenities. However, naturally occurring ponds may include those artificial ponds intentionally created from dry areas in order to mitigate conversion of ponds, if permitted by a regulatory authority.
- (c) Waters of the State, as defined in WAC Title 222, Forest Practices Rules and Regulations. Waters of the State shall be classified using the system in WAC 222-16-030. In classifying waters of the State as fish and wildlife habitats the following shall be used:
 - (1) Species are present which are endangered, threatened or sensitive;
 - (2) Existing surrounding land uses are incompatible with salmonid and other game fish habitat;
 - (3) Presence and size of riparian ecosystem;
 - (4) Existing water rights.

(d) Lakes, ponds, and streams planted with game fish (defined at RCW [77.09.020](#)), including those planted under the auspices of Federal, State, local, or tribal programs, or which support priority fish species as identified by the Department of Fish and Wildlife.

(e) State natural area preserves and natural resource conservation areas.

~~(f) Habitats or species of local importance. Such habitats or species may be locally listed per the process elucidated in Section [14.88.415](#).~~

~~(g)~~ Streams shall be classified according to the stream type system as provided in WAC [222-16-030](#), Stream Classification System, as amended.

(1) Type S Stream. Those streams, within their ordinary high water mark, as inventoried as shorelines of the State under Chapter [90.58](#) RCW and the rules promulgated pursuant thereto.

(2) Type F Stream. Those stream segments within the ordinary high water mark that are not Type S streams, and which are demonstrated or provisionally presumed to be used by fish. Stream segments which have a width of two feet or greater at the ordinary high water mark and have a gradient of 16 percent or less for basins less than or equal to 50 acres in size, or have a gradient of 20 percent or less for basins greater than 50 acres in size, are provisionally presumed to be used by fish. A provisional presumption of fish use may be refuted at the discretion of the ~~Planning and Community Development Director~~[Shoreline Administrator](#) where any of the following conditions are met:

(i) It is demonstrated to the satisfaction of the City that the stream segment in question is upstream of a complete, permanent, natural fish passage barrier, above which no stream section exhibits perennial flow;

(ii) It is demonstrated to the satisfaction of the City that the stream segment in question has confirmed, long-term, naturally occurring water quality parameters incapable of supporting fish;

(iii) Sufficient information about a geomorphic region is available to support a departure from the characteristics described above for the presumption of fish use, as determined in consultation with the Washington Department of Fish and Wildlife, the Department of Ecology, affected tribes, or others;

(iv) The Washington Department of Fish and Wildlife has issued a hydraulic project approval, pursuant to RCW [77.55.100](#), which includes a determination that the stream segment in question is not used by fish;

(v) No fish are discovered in the stream segment in question during a stream survey conducted according to the protocol provided in the Washington Forest Practices

Board Manual, Section 13, Guidelines for Determining Fish Use for the Purpose of Typing waters under WAC [222-16-031](#); provided, that no unnatural fish passage barriers have been present downstream of said stream segment over a period of at least two years.

(3) Type Np Stream. Those stream segments within the ordinary high water mark that are perennial and are not Type S or Type F streams. However, for the purpose of classification, Type Np streams include intermittent dry portions of the channel below the uppermost point of perennial flow. If the uppermost point of perennial flow cannot be identified with simple, nontechnical observations (see Washington Forest Practices Board Manual, Section 23), then said point shall be determined by a qualified professional selected or approved by the City.

(4) Type Ns Stream. Those stream segments within the ordinary high water mark that are not Type S, Type F, or Type Np streams. These include seasonal streams in which surface flow is not present for at least some portion of a year of normal rainfall that are not located downstream from any Type Np stream segment.

3.B Determination of Boundary.

(a) The boundaries of fish and wildlife conservation areas shall be determined by the ~~Planning and Community Development Director~~[Shoreline Administrator](#), who may rely on a Departmental approved biological resources survey prepared by a qualified wildlife biologist per the Department's Biological Resources Survey Guidelines. Such a report would be supplied by the applicant of a permit.

(b) The boundary of the creek, stream, river, lake, or other surface water shall be determined by the ~~Planning and Community Development Director~~[Shoreline Administrator](#), relying on a delineation by a licensed surveyor or other comparable expert. Such boundary shall be contiguous with the 100-year floodplain designations as adopted by the City, or where such a designation has not been adopted by the City, the 100-year floodplain designation of the Federal Emergency Management Agency (FEMA) and the National Flood Insurance Program where it has been delineated (shown on Flood Insurance Rate Maps (FIRM)). Where this information does not exist, the boundary determination shall be made by a licensed surveyor and based upon the same criteria used by FEMA. This determination shall be confirmed by the City Engineer.

3.C Allowed Activities.

Except where regulated by other sections of this or any other title or law, the following uses shall be allowed within fish and wildlife conservation areas when the requirements of Section [3.D](#) have been met and mitigation adequate to alleviate any other impacts has been proposed:

(a) Those activities listed in ~~Section 14.88.220~~[this SMP](#).

(b) Activities consistent with the species located there and all applicable State and Federal regulations regarding the species, as determined by the ~~Planning and Community Development Director~~Shoreline Administrator, who may consult with other resource agencies as to their recommendations.

(c) Bridges and other crossings over streams for public and private rights-of-way.

3.D Requirements.

(a) Except as provided in this subsection, a 50-foot buffer shall be required for all regulated activities adjacent to fish and wildlife conservation areas. All buffers shall be measured from the fish and wildlife conservation area boundary as surveyed in the field. The width of the buffer may be increased depending on the habitat value and the proposed land use.

(b) Buffer widths may be increased based on recommendations by the Department of Fish and Wildlife based on their Management Recommendations for Priority Habitats and Species.

(c) To retain the natural functions of streams and stream corridors, the following streamside buffers shall be maintained:

- (1) For ravines with banks greater than 10 feet in depth, maintain the existing or native vegetation within the ravine and a strip 25 feet from the top of the bank;
- (2) Where there is no ravine or the bank is less than 10 feet in depth, maintain existing or native vegetation on both sides of the stream as measured from the ordinary high water mark (OHWM), in accordance with Table 3-1, which sets forth the required buffer widths based on classification of stream types:

Table 3-1: Stream Buffer Width

Stream Type	Buffer
S	150 feet
F	100 feet
Np	50 feet
Ns	50 feet

(d) Widths shall be measured outward in each direction, on the horizontal plane, from the ordinary high water mark, or from the top of the bank if the ordinary high water mark cannot be identified, or from the outer edge of the channel migration zone when present.

(e) The ~~Planning and Community Development Director~~Shoreline Administrator may modify the buffer widths in the above table in accordance with the following:

(1) Buffer widths may be increased as necessary to fully protect riparian functions. For example, the buffer may be extended to the outer edge of the floodplain or windward into an area of high tree blow-down potential as determined by an arborist.

(2) Buffer widths may be reduced in exchange for restoration and enhancement of degraded areas in accordance with an approved plan, ~~or for buffer averaging in accordance with Section 14.88.275 and subsection (e)(4) of this section.~~

(3) If the stream enters an underground culvert or pipe, and is unlikely to ever be restored aboveground, the ~~Planning and Community Development Director~~ Shoreline Administrator may waive the buffer along the undergrounded stream; provided, that where the stream enters and emerges from the pipe the opposite outer edges of the buffer shall be joined by a radius equal to the buffer width, with said radius projecting over the piped stream.

(4) ~~Stream buffer widths may be modified by averaging. In no instance shall the buffer width be reduced by more than 25 percent of the standard buffer. Stream buffer width averaging shall only be allowed when the applicant demonstrates the following:~~

~~(i)—A site specific evaluation and documentation of buffer adequacy is based on consideration of the best available science as described in Section 14.88.235; and~~

~~(ii)—A buffer enhancement plan is proposed that would significantly improve the functions and values of the stream buffer(s); and~~

~~(iii)—The averaging will not impair or reduce the habitat, water quality purification and enhancement, stormwater detention, groundwater recharge, shoreline protection and erosion and other functions and values of the stream and buffer.~~

~~(5)—~~Buffer widths may be modified if the subject property is separated from the stream channel by pre-existing, intervening, and lawfully created structures, public roads, or other substantial pre-existing intervening improvements. The intervening structures, public roads, or other substantial improvements must separate the subject upland property from the stream channel by height or width, preventing or impairing the delivery of buffer functions to the stream channel. In such cases, the reduced buffer width shall reflect the buffer functions that can be delivered to the stream channel.

~~(f)—Development in the shorelines of State-wide significance is regulated under the City's State-approved Shoreline Master Program (SMP). Because such shorelines are considered fish and wildlife conservation areas, they are also regulated under this chapter. Accordingly, the setbacks of subsection (a) of this section shall apply when there are no setbacks specified in the SMP, and the more restrictive setbacks shall apply when there are setbacks specified in both the SMP and this chapter.~~

(g) To protect the natural functions and aesthetic qualities of a stream and stream buffer, a detailed temporary erosion control plan which identifies the specific mitigating measures to be implemented during construction to protect the water from erosion, siltation, landslides and hazardous construction materials shall be required. The City shall review the plan with the appropriate State, Federal and tribal agencies and any adjacent jurisdiction.

3.E Mitigation.

In order to avoid significant environmental impacts, the applicant for a land use or development permit may consider performing the following actions, listed in order of preference. What is considered adequate mitigation will depend on the nature and magnitude of the potential impact as determined in accordance with Section [2.G](#).

(a) Dedicate an exclusive open space easement for the protection of wildlife and/or habitat, creeks, streams, rivers, lakes, or other surface water over the creeks, streams, rivers, lakes, or other surface water and a buffer consistent with the standards listed in Section [3.D](#). Where such mitigation leads to, or would in the opinion of the ~~Planning and Community Development Director~~[Shoreline Administrator](#) lead to a court finding of a taking, the below listed mitigation may be considered.

(b) Where on-site protection is not possible, dedicate an exclusive easement for the protection of an equivalent (in type and value) waterway over the waterway and a 50-foot buffer on an off-site waterway at a 2:1 ratio. The location of any off-site waterway shall be located as near to the site as possible, in accordance with the following preferred order:

- (1) Contiguous to the impacted waterway;
- (2) Within the same drainage basin;
- (3) Elsewhere within the City;
- (4) Within the Lake Stevens UGA;
- (5) Within the region.

Part 4. Frequently Flooded Areas

4.A Classification.

Classification for flood zones shall be consistent with the 100-year floodway and floodplain designations as adopted by the City, or where such a designation has not been adopted by the City, by the 100-year flood zone designation of the Federal Emergency Management Agency and the National Flood Insurance Program. Any such designations adopted by the City shall consider the following criteria if and when designating and classifying these areas:

(a) Flooding impact to human health, safety, and welfare and to public facilities and services;
and

- (b) Documentation including Federal, State and local laws, regulations and programs, local maps and federally subsidized flood insurance programs; and
- (c) The future floodplain defined as a channel of the stream and that portion of the adjoining floodplain which is necessary to contain and discharge the base flood flow at build-out without any measurable increase in flood heights.

4.B Determination of Boundary.

The boundary of a flood zone shall be contiguous with the 100-year floodway and floodplain designations as adopted by the City, or where such a designation has not been adopted by the City, the 100-year floodplain designation of the Federal Emergency Management Agency (FEMA) and the National Flood Insurance Program where it has been delineated (shown on Flood Insurance Rate Maps (FIRM)). Where this information does not exist, the boundary determination shall be made by a licensed engineer and based upon the same criteria used by FEMA. This determination shall be confirmed by the City Engineer.

4.C Allowed Activities.

Except where regulated by other sections of this or any other title or law, the following uses shall be allowed within floodways or floodplains when the requirements of Section [4.D](#) have been met and mitigation adequate to alleviate any other impacts has been proposed:

- (a) Floodways.
 - (1) Those activities allowed per [Section 14.88.220 this SMP](#).
 - (2) Outdoor nonmotorized recreational activities (including fishing, birdwatching, hiking, boating, horseback riding, swimming, canoeing, bicycling) and aquatic recreation facilities (docks, piers, boat mooring buoys, marinas and associated uses, swimming areas, parks).
- (b) Floodplains.
 - (1) All those activities allowed in floodways.
 - (2) Recreational fields.

4.D Requirements.

All land uses and development proposals shall comply with the [SMP and ordinances development regulations](#) adopted by the City of Lake Stevens for general and specific flood hazard protection ~~(see Chapter 14.64, Floodways, Floodplains, Drainage, and Erosion)~~.

Development shall not reduce the effective base flood storage volume. Reduction of the flood water storage volume effectiveness due to grading, construction, or other regulated activities shall be compensated for by creating on- or off-site detention and/or retention ponds. Effective storage capacity must be maintained. Base flood data and flood hazard notes shall be on the face of any recorded plat or site plan including, but not limited to, base flood elevations, flood protection elevation, boundary of floodplain and zero-rise floodway.

4.E Mitigation.

If potential flooding impacts cannot be avoided by design or by providing on- or off-site detention and/or retention ponds, other forms of mitigation may be considered in order to avoid significant environmental impacts. Applicants must provide mitigation plans exploring and analyzing any proposed mitigation measures.

Part 5. Geologically Hazardous Areas**5.A Classification.**

(a) Geologically hazardous areas include areas susceptible to erosion, sliding, earthquakes, liquefaction, or other geological events. Geologically hazardous areas shall be classified based upon the history or existence of landslides, unstable soils, steep slopes, high erosion potential or seismic hazards. In determining the significance of a geologically hazardous area the following criteria shall be used:

- (1) Potential economic, health, and safety impact related to construction in the area;
- (2) Soil type, slope, vegetative cover, and climate of the area;
- (3) Available documentation of history of soil movement, the presence of mass wastage, debris flow, rapid stream incision, stream bank erosion or undercutting by wave action, or the presence of an alluvial fan which may be subject to inundation, debris flows, or deposition of stream-transported sediments.

(b) The different types of geologically hazardous areas are defined as follows:

(1) Erosion hazard areas are as defined by the USDA Soil Conservation Service, United States Geologic Survey, or by the Department of Ecology Coastal Zone Atlas. The following classes are high erosion hazard areas.

(i) Class 3, class U (unstable) includes severe erosion hazards and rapid surface runoff areas;

(ii) Class 4, class UOS (unstable old slides) includes areas having severe limitations due to slope; and

(iii) Class 5, class URS (unstable recent slides).

(2) Landslide hazard areas shall include areas subject to severe risk of landslide based on a combination of geologic, topographic and hydrologic factors. Some of these areas may be identified in the Department of Ecology Coastal Zone Atlas, or through site-specific criteria. Landslide hazard areas include the following:

(i) Areas characterized by slopes greater than 15 percent; and impermeable soils (typically silt and clay) frequently interbedded with permeable granular soils (predominantly sand and gravel) or impermeable soils overlain with permeable soils; and springs or groundwater seepage;

- (ii) Any area which has exhibited movement during the Holocene epoch (from 10,000 years ago to present) or which is underlain by mass wastage debris of that epoch;
 - (iii) Any area potentially unstable due to rapid stream incision, stream bank erosion or undercutting by wave action;
 - (iv) Any area located on an alluvial fan presently subject to or potentially subject to inundation by debris flows or deposition of stream-transported sediments;
 - (v) Any area with a slope of 40 percent or greater and with a vertical relief of 10 or more feet except areas composed of consolidated rock;
 - (vi) Any area with slope defined by the United States Department of Agriculture Soil Conservation Service as having a severe limitation for building site development; and
 - (vii) Any shoreline designated or mapped as class U, UOS, or URS by the Department of Ecology Coastal Zone Atlas.
- (3) Slopes.
- (i) Moderate slopes shall include any slope greater than or equal to 15 percent and less than 40 percent.
 - (ii) Steep slopes shall include any slope greater than or equal to 40 percent.
- (4) Seismic hazard areas shall include areas subject to severe risk of earthquake damage as a result of seismic induced settlement, shaking, slope failure or soil liquefaction. These conditions occur in areas underlain by cohesionless soils of low density usually in association with a shallow groundwater table.

5.B Determination of Boundary.

Determination of a boundary of a geologically hazardous area shall be made by the ~~Planning and Community Development Director~~ Shoreline Administrator, relying on a geotechnical or similar technical report and other information where available and pertinent. Such reports or information shall be provided by an applicant for an activity or permit at the request of the City.

5.C Allowed Activities.

Except where regulated by other sections of this or any other title or law, the following uses shall be allowed within geologically hazardous areas when the requirements of Section 5.D have been met and mitigation adequate to alleviate any other impacts has been proposed:

- (a) Those activities allowed per ~~Section 14.88.220~~ this SMP.

(b) Any other use allowed per the ~~zone~~environment designation; provided, that it meets the requirements of Section 5.D and will not have a detrimental impact on the health, safety, and welfare of the public, or will not negatively impact neighboring properties.

(c) No new development or creation of new lots is allowed that would cause foreseeable risk from geological conditions to people or improvements during the life of the development (WAC 173-26-221(2)(c)(ii)(B)).

(d) No new development is allowed that would require structural shoreline stabilization over the life of the development. Exceptions may be made for the limited instances where stabilization is necessary to protect allowed uses where no alternative locations are available and no net loss of ecological functions will result. (WAC 173-26-221(2)(c)(ii)(C)).

5.D Geological Assessment Requirements.

Development proposals on or within 200 feet of any areas which are designated as geologically hazardous, or which the City has reason to believe are geologically hazardous based on site-specific field investigation, shall be required to submit a geological assessment.

(a) The geological assessment shall be submitted with the minimum required content as set forth in subsection (d) of this section and in the format established by the ~~Planning and Community Development Director~~Shoreline Administrator, and shall be consistent with the following:

(1) A geotechnical letter is required when the geologist finds that no active geological hazard area exists on or within 200 feet of the site.

(2) A geotechnical report is required when the geologist finds that an active geological hazard area exists on or within 200 feet of the proposed project area.

(b) The Department shall review the geological assessment and either accept or reject the assessment and require revisions or additional information. When the geological assessment has been accepted, the Department shall issue a decision on the land use permit application.

(c) A geological assessment for a specific site may be valid for a period of up to five years when the proposed land use activity and site conditions affecting the site are unchanged. However, if any surface and subsurface conditions associated with the site change during the five-year period or if there is new information about a geological hazard, the applicant may be required to submit an amendment to the geological assessment.

(d) A geological assessment shall include the following minimum information and analysis:

(1) A field investigation that may include the use of historical air photo analysis, review of public records and documentation, and interviews with adjacent property owners or others knowledgeable about the area, etc.

- (2) An evaluation of any areas on the site or within 200 feet of the site that are geologically hazardous as set forth in Section [5.A](#).
 - (3) An analysis of the potential impacts of the proposed development activity on any potential geological hazard that could result from the proposed development either on site or off site. For landslide hazard areas, the analysis shall consider the run-out hazard of landslide debris to the proposed development that starts upslope whether the slope is part of the subject property or starts off site.
 - (4) Identification of any mitigation measures required to eliminate potentially significant geological hazards both on the proposed development site and any potentially impacted off-site properties. When hazard mitigation is required, the mitigation plan shall specifically address how the proposed activity maintains or reduces the pre-existing level of risk to the site and adjacent properties on a long term basis. The mitigation plan shall include recommendations regarding any long term maintenance activities that may be required to mitigate potential hazards.
 - (5) The geological assessment shall document the field investigations, published data and references, data and conclusions from past geological assessments, or geotechnical investigations of the site, site-specific measurements, tests, investigations, or studies, as well as the methods of data analysis and calculations that support the results, conclusions, and recommendations.
 - (6) The geological assessment shall contain a summary of any other information the geologist identifies as relevant to the assessment and mitigation of geological hazards.
- (e) Geological assessments shall be prepared under the responsible charge of a geologist, and shall be signed, sealed, and dated by the geologist.

5.E Setback Buffer Requirements.

- (a) The setback buffer width shall be based upon information contained in a geological assessment, and shall be measured on a horizontal plane from a vertical line established at the edge of the geologically hazardous area limits (both from the top and toe of slope). In the event that a specific setback buffer is not included in the recommendation of the geological assessment, the setback buffer shall be based upon the standards contained in Chapter 18 of the International Building Code (IBC), or as the IBC is updated and amended.
 - (1) If the geological assessment recommends setback buffers that are less than the standard buffers that would result from application of Chapter 18 of the IBC, the specific rationale and basis for the reduced buffers shall be clearly articulated in the geological assessment.

(2) The City may require increased setback buffer widths under any of the following circumstances:

- (i) The land is susceptible to severe erosion and erosion control measures will not effectively prevent adverse impacts.
 - (ii) The area has a severe risk of slope failure or downslope stormwater drainage impacts.
 - (iii) The increased buffer is necessary to protect public health, safety and welfare based upon findings and recommendations of geological assessment.
- (b) Unless otherwise permitted as part of an approved alteration, the setback buffers required by this subsection shall be maintained in native vegetation to provide additional soil stability and erosion control. If the buffer area has been cleared, it shall be replanted with native vegetation in conjunction with any proposed development activity.
- (c) The City may impose seasonal restrictions on clearing and grading within 200 feet of any geologically hazardous areas.

5.F Allowed Alterations.

Unless associated with another critical area, the ~~Planning and Community Development Director may allow~~ alterations of an area may be allowed if identified as a geologically hazardous area or the setback buffers specified in the IBC if an approved geotechnical report demonstrates the following and the request is made through a shoreline variance process that:

- (a) The proposed development will not create a hazard to the subject property, surrounding properties or rights-of-way, or erosion or sedimentation to off-site properties or bodies of water;
- (b) The proposal addresses the existing geological constraints of the site, including an assessment of soils and hydrology;
- (c) The proposed method of construction will reduce erosion potential, landslide and seismic hazard potential, and will improve or not adversely affect the stability of slopes;
- (d) The proposal uses construction techniques which minimize disruption of existing topography and natural vegetation;
- (e) The proposal is consistent with the purposes and provisions of this ~~chapter appendix~~ and mitigates any permitted impacts to critical areas in the vicinity of the proposal;
- (f) The proposal mitigates all impacts identified in the geotechnical letter or geotechnical report;
- (g) All utilities and access roads or driveways to and within the site are located so as to require the minimum amount of modification to slopes, vegetation or geologically hazardous areas; and

(h) The improvements are certified as safe as designed and under anticipated conditions by a geologist.

5.G Prohibited Alterations.

Modification of geologically hazardous areas shall be prohibited under the following circumstances:

(a) Where geologically hazardous slopes are located in a stream, wetland, and/or a fish and wildlife habitat conservation area or their required buffers, alterations of the slopes are not permitted, except as allowed in Section [2.C](#). The required buffer for such slopes shall be determined through the site-specific geological assessment, but in no case shall be less than 25 feet from the top of slopes of 25 percent and greater.

(b) Any proposed alteration that would result in the creation of, or which would increase or exacerbate existing geological hazards, or which would result in substantial unmitigated geological hazards either on or off site shall be prohibited.

5.H Mitigation.

(a) In addition to the other requirements of this ~~chapter~~[SMP](#), as part of any approval of development on or adjacent to geologically hazardous areas or within the setback buffers required by this section:

(1) The City shall require:

(i) Geologically hazardous areas not approved for alteration and their buffers shall be placed in a native growth protection area as set forth in Section [2.M](#).

(ii) Any geologically hazardous area or required setback buffer that is allowed to be altered subject to the provisions of this ~~chapter~~[appendix](#) shall be subject to a covenant of notification and indemnification/hold harmless agreement in a form acceptable to the City Attorney. Such document shall identify any limitation placed on the approved alterations.

(2) The City may require:

(i) The presence of a geologist on the site to supervise during clearing, grading, filling, and construction activities which may affect geologically hazardous areas, and provide the City with certification that the construction is in compliance with the geologist's recommendations and has met approval of the geologist, and other relevant information concerning the geologically hazardous conditions of the site.

(ii) Vegetation and other soil stabilizing structures or materials be retained or provided.

(iii) Long term maintenance of slopes and on-site drainage systems.

(b) If potential geologic impacts cannot be avoided by adhering to the above requirements and the other requirements of this ~~chapter~~[appendix](#), other forms of mitigation may be considered.

Applicants must provide mitigation plans exploring and analyzing any proposed mitigation measures. What is considered adequate mitigation will depend on the nature and magnitude of the potential impact. For example, some potential risk due to construction in geologically hazardous areas may be reduced through structural engineering design.

Part 6. Wetlands

6.A Classification.

Wetlands shall be classified as Category I, II, III, or IV using the Washington State Department of Ecology's Wetland Rating System for Western Washington, Publication No. 04-06-025, or as amended hereafter. Wetland delineations shall be determined ~~by using the Washington State Wetlands Identification and Delineation Manual, March 1997, or as amended hereafter.~~ in accordance with WAC 173-22-035.

(a) Sources used to identify designated wetlands include, but are not limited to:

- (1) United States Department of the Interior, Fish and Wildlife Service, National Wetlands Inventory.
- (2) Areas identified as hydric soils, soils with significant soil inclusions and wet spots with the United States Department of Agriculture/Soil Conservation Service Soil Survey for Snohomish County.
- (3) Washington State Department of Natural Resources, Geographic Information System, Hydrography and Soils Survey Layers.
- (4) City of Lake Stevens Critical Areas Inventory Maps.

(b) Category I Criteria.

- (1) Wetlands that represent a unique or rare wetland type; or
- (2) Are more sensitive to disturbance than most wetlands; or
- (3) Are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime; or
- (4) Provide a high level of functions.
- (5) Category I wetlands include:
 - ~~(i) Estuarine wetlands which are larger than one acre in size.~~
 - (ii) Natural heritage wetlands as identified by the Natural Heritage Program of the Natural Resources.
 - (iii) Bogs.
 - (iii*) Mature and old-growth forested wetlands over one acre in area.
 - (iv) Wetlands that score 70 or more points out of 100 using the Western Washington Rating System.

(c) Category II Criteria.

(1) Category II wetlands are difficult though not impossible to replace and provide high levels of some functions.

(2) Category II wetlands ~~include criteria.~~

~~(i) — Estuarine wetlands under one acre in area.~~

~~(ii) —~~ Wetlands that score between 51 and 69 points out of 100 on the Western Washington Rating System.

(d) Category III Criteria. Wetlands with a moderate level of functions and with rating system scores between 30 and 50 points out of 100.

(e) Category IV Criteria. Wetlands with a low level of functions and with rating system scores less than 30 points out of 100.

6.B Determination of Boundary.

(a) The ~~Planning and Community Development Director~~Shoreline Administrator, relying on a field investigation supplied by an applicant and applying the wetland definition provided in this ~~chapter~~SMP, shall determine the location of the wetland boundary. Qualified professional and technical scientists shall perform wetland delineations as part of a wetland identification report in accordance with WAC 173-22-035 ~~using the Washington State Wetlands Identification and Delineation Manual, March 1997, or as amended hereafter.~~ Criteria to be included in a required wetland identification report may be found in Section 2.G, Mitigation/Enhancement Plan Requirements. The applicant is required to show the location of the wetland boundary on a scaled drawing as a part of the permit application.

(b) When the applicant has provided a delineation of the wetland boundary, the ~~Planning and Community Development Director~~Shoreline Administrator shall verify the accuracy of, and may render adjustments to, the boundary delineation. In the event the adjusted boundary delineation is contested by the applicant, the ~~Planning and Community Development Director~~Shoreline Administrator shall, at the applicant's expense, obtain expert services to render a final delineation.

(c) The ~~Planning and Community Development Director~~Shoreline Administrator, when requested by the applicant, may waive the delineation of boundary requirement for the applicant and, in lieu of delineation by the applicant, perform the delineation. The ~~Planning and Community Development Director~~Shoreline Administrator shall consult with qualified professional scientists and technical experts or other experts as needed to perform the delineation. The applicant will be charged for the costs incurred. Where the ~~Planning and Community Development Director~~Shoreline Administrator performs a wetland delineation at the request of the applicant, such delineation shall be considered a final determination.

6.C Allowed Activities.

Except where regulated by other sections of this [appendix, SMP](#) or any other title or law, and provided they are conducted using best management practices, the following uses and activities shall be allowed and regulated within wetlands and their buffers when the requirements of Sections [6.D](#) and [6.E](#) have been met and mitigation adequate to alleviate any other impacts has been proposed:

- (a) Those uses listed in Section [2.C](#).
- (b) In Category IV wetlands only, access to developable portions of legal lots [using the shoreline variance process](#), where:
 - (1) There is no other reasonable method of accessing the property;
 - (2) Altering the terrain would not cause drainage impacts to neighboring properties; and
 - (3) Not more than 2,500 square feet of wetland is impacted.

6.D Requirements.

(a) Buffers. Wetland buffers shall be required for all regulated activities adjacent to regulated wetlands as provided in Table 6-1, unless modified per subsection (b) or (c) of this section. Any wetland created, restored, or enhanced as compensation for approved wetland alterations shall also include the standard buffer required for the category of the created, restored, or enhanced wetland. All buffers shall be measured from the wetland boundary as surveyed in the field. The width of the wetland buffer zone shall be determined according to wetland category and the proposed land use.

These buffers have been established to reflect the impact of low and high intensity uses on wetland functions and values.

Table 6-1

Category	Land Use	HS 29-36	HS 29-36	HS 20-28	HS 20-28	HS <20
I	High	190	190	95	95	65
	Low	125	125	65	65	45
II	High	190	190	95	95	65
	Low	125	125	65	65	45
III	High	N/A	N/A	95	95	50
	Low			65	65	35
IV	High	N/A	N/A	N/A	N/A	35
	Low					20

Table 6-1 Wetland Buffer Requirements

Category	<u>Sub-Category</u> <u>Land Use</u>	<u>HS</u> <u>3029-36</u>	<u>HS 210-</u> <u>298</u>	<u>HS <210</u>
I	<u>Based on Total</u>	<u>490225</u>	<u>9165</u>	<u>6105</u>
	<u>Score Bogs</u>	<u>425225</u>	<u>65190</u>	<u>45190</u>
	<u>Forested</u>	<u>225</u>	<u>165</u>	<u>105</u>
II	<u>High</u>	<u>190</u>	<u>95</u>	<u>65</u>
	<u>Low</u>	<u>425225</u>	<u>65165</u>	<u>45105</u>
III	<u>High</u>	<u>N/A60</u>	<u>95</u>	<u>50</u>
	<u>Low</u>		<u>65165</u>	<u>35105</u>
IV	<u>High</u>	<u>N/A40</u>	<u>N/A40</u>	<u>35</u>
	<u>Low</u>			<u>2040</u>
Disruption of corridors or connections	<ul style="list-style-type: none"> <u>Maintain connections to offsite areas that are undisturbed</u> <u>Restore corridors or connections to offsite habitats by replanting</u> 			

(b) Increased Wetland Buffer Widths. The ~~Planning and Community Development Director~~Shoreline Administrator shall require increased standard buffer zone widths on a case-by-case basis when a larger buffer is necessary to protect wetland functions and values based on local conditions. This determination shall be supported by appropriate documentation showing that it is reasonably related to protection of the functions and values of the regulated wetland. Such determination shall be attached as a permit condition and shall demonstrate that:

- (1) A larger buffer is necessary to maintain viable populations of existing species; or
- (2) The wetland is used by species proposed or listed by the Federal Government or the State as endangered, threatened, sensitive, critical or outstanding potential habitat for those species or has unusual nesting or resting sites such as heron rookeries or raptor nesting trees. An applicant must consult with the State Department of Fish and Wildlife to confirm any special recommendations for candidate or monitor species as listed for approval by the ~~Planning and Community Development Director~~Shoreline Administrator; or
- (3) The adjacent land is susceptible to severe erosion and erosion control measures will not effectively prevent adverse wetland impacts, or the adjacent land has minimal vegetative cover or slopes greater than 15 percent; or
- (4) The larger buffer is required to meet no net loss of habitat function.

(c) Wetland Buffer Width Averaging. Wetland buffer widths may be modified by averaging with the shoreline variance process. In no instance shall the buffer width be reduced by more than 25 percent of the standard buffer. Wetland buffer width averaging shall be allowed only where the applicant demonstrates all of the following:

- (1) The averaging will not impair or reduce the habitat, water quality purification and enhancement, stormwater detention, groundwater recharge, shoreline protection, erosion protection, and other functions and values of the wetland and buffer; ~~and~~
- (2) The total area contained within the wetland buffer after averaging is no less than that contained within the standard buffer prior to averaging; and
- (3) The averaging ensures no net loss of habitat function.

(d) Buffer Conditions. Except as otherwise specified, wetland buffers shall be retained in their natural condition. Where buffer disturbance ~~may or~~ has occurred outside of the development footprint during construction, revegetation with native wetland vegetation ~~may shall~~ be required.

(e) Permitted Uses in a Wetland Buffer. Regulated activities shall not be allowed in a buffer zone except for the following:

- (1) Activities having minimal adverse impacts on buffers and no adverse impacts on regulated wetlands. These may include low intensity, passive recreational activities such as pervious trails, nonpermanent wildlife watching blinds, short-term scientific or educational activities, and sports fishing or hunting;
- (2) For Category III and IV wetlands, stormwater management facilities restricted to the outer 25 percent of the buffer around the wetland; or
- (3) For Category III and IV wetlands, development having no feasible alternative location.

(f) Buffer Reductions. Buffer reductions may be allowed for Category III or IV wetlands, provided the applicant demonstrates the proposal meets the criteria in subsections (f)(1) through (4) of this section and either subsection (f)(5) or (6) of this section. Buffer width reduction proposals that meet the criteria as determined by the Planning and Community Development Director shall be reduced by no more than 25 percent of the required buffer and shall not be less than 25 feet in width.

- (1) The buffer area meets buffer area planting in Section 2.G and has less than 15 percent slopes; and
- (2) A site-specific evaluation and documentation of buffer adequacy is based on consideration of the best available science as described in Section 14.88.235; and

- (3) Buffer width averaging as outlined in subsection (c) of this section is not being used; and
- (4) A buffer enhancement plan is proposed that would significantly improve the function and value of the wetland; and either
- (5) The subject property is separated from the wetland by pre-existing, intervening, and lawfully created structures, public roads, or other substantial improvements. The pre-existing improvements must be found to separate the subject upland property from the wetland by height or width that prevents or impairs the delivery of buffer functions to the wetland. In such cases, the reduced buffer width shall reflect the buffer functions that can be delivered to the wetland; or
- (6) The wetland scores less than 20 points for wildlife habitat in accordance with the rating system applied in Section [6.A](#), and mitigation is provided based on Section [6.E](#)(b) and Table 6-2, when determined appropriate based on the evaluation criteria in Section [6.e](#)(f).

Table 6-2: Disturbance Mitigation

Examples of Disturbance	Activities that May Cause Disturbance	Example Measures to Minimize Impacts
Lights	Parking lots, warehouses, manufacturing, high density residential	Direct lights away from wetland
Noise	Manufacturing, high density residential	Place activity away from wetland
Pets and humans	Residential areas	Landscaping to delineate buffer edge and to discourage disturbance of wildlife by humans and pets
Dust	Tilled fields	Best management practices for dust control
Toxic runoff*	Parking lots, roads, manufacturing, residential areas, landscaping	-Route all new untreated runoff away from wetland while ensuring that wetland is not dewatered -Establish covenants governing use of pesticides within 150 feet of wetland -Apply integrated pest management
Stormwater	Parking lots, roads, manufacturing,	-Retrofit stormwater detention and

runoff	residential areas, commercial areas, landscaping	treatment for roads and existing adjacent development -Prevent channelized flow from lawns that directly enters buffer
*These examples are not necessarily adequate for minimizing toxic runoff if threatened or endangered species are present at the site.		

(g) Buffers may be modified when approved for the purpose of implementing innovative development design in accordance with Section [2.P](#).

6.E Mitigation.

The mitigation sequence set forth in ~~this section~~ [WAC 173-26-201\(2\)\(e\)](#) should be applied after impact avoidance and minimization measures have been taken. Compensatory mitigation for alterations to wetlands shall be used only for impacts that cannot be avoided or minimized and shall achieve equivalent or greater biologic functions. The design for the compensatory mitigation project needs to be appropriate for its location (i.e., position in the landscape). Therefore, compensatory mitigation should not result in the creation, restoration, or enhancement of an atypical wetland. An atypical wetland refers to a compensation wetland (e.g., created or enhanced) that does not match the type of existing wetland that would be found in the geomorphic setting of the site (i.e., the water source(s) and hydroperiod proposed for the mitigation site are not typical for the geomorphic setting).

(a) Location and Timing of Mitigation.

(1) Restoration, creation, or enhancement actions should be undertaken on or adjacent to the site. If this is shown in the critical areas report not to be feasible, ~~or, where~~ restoration, creation, or enhancement of a former wetland is proposed, may occur within the same watershed, but preferably as close to the existing wetland as possible. In-kind replacement of the impacted wetland is preferred for creation, restoration, or enhancement actions. The City may accept or recommend restoration, creation, or enhancement which is off site ~~and/or out of kind~~, if the applicant can demonstrate that on-site or in-kind restoration, creation, or enhancement is unfeasible due to constraints such as parcel size or wetland type, or that a wetland of a different type or location is justified based on regional needs or functions. A watershed plan must be submitted if off-site mitigation is proposed;

(2) Whether occurring on site or off site, the mitigation project shall occur near an adequate water supply with a hydrologic connection to the wetland to ensure a successful wetlands development or restoration;

(3) Any approved mitigation proposal shall be completed before initiation of other permitted activities, unless a phased or concurrent schedule has also been approved by the Planning and Community Development Department Shoreline Administrator;

- (4) Wetland acreage replacement ratios shall be as specified in Table 6-3;
- (5) Credits from a wetland mitigation bank may be approved for use as compensation for unavoidable impacts to wetlands.
- (i) This provision may be used when:
 - a. The bank is certified under Chapter [173-700](#) WAC;
 - b. The ~~Planning and Community Development Director~~[Shoreline Administrator](#) determines that the wetland mitigation bank provides appropriate compensation for the authorized impacts; and
 - c. The proposed use of credits is consistent with the terms and conditions of the bank's certification.
 - (ii) Replacement ratios for projects using bank credits shall be consistent with replacement ratios specified in the bank's certification.
 - (iii) Credits from a certified wetland mitigation bank may be used to compensate for impacts located within the service area specified in the bank's certification. In some cases, the service area of the bank may include portions of more than one adjacent drainage basin for specific wetland functions.

(6) Fees are paid to an approved in-lieu fee program to compensate for the impacts.

(b) Mitigation Performance Standards.

(1) All reasonable measures shall be taken to avoid and reduce impacts. When such avoidance and reduction is not reasonable, adverse impacts to wetland functions and values shall be mitigated. Mitigation actions shall be implemented in the preferred sequence identified in Section [1.A](#)(a). Proposals which include less preferred or compensatory mitigation shall demonstrate that:

- (i) All reasonable measures will be taken to reduce impacts and losses to the original wetland;
- (ii) No overall net loss will occur in wetland functions, values and acreage; and
- (iii) The restored, created or enhanced wetland will be as persistent and sustainable as the wetland it replaces.

(c) Wetland Replacement Ratios.

(1) Where wetland alterations are permitted by this ~~chapter~~[appendix and SMP](#), the applicant shall restore or create equivalent areas of wetlands in order to compensate for wetland losses. Equivalent areas shall be determined according to size, function, category, location, timing factors, and projected success of restoration or creation.

(2) Where wetland creation is proposed, all required buffers for the creation site shall be located on the proposed creation site. Properties adjacent to or abutting wetland creation projects shall not be responsible for providing any additional buffer requirements.

(3) Mitigation ratios for the replacement of impacted wetlands shall be as listed in Table 6-3. The following acreage replacement ratios shall be used as targets. The ~~Planning and Community Development Director~~Shoreline Administrator may vary these standards if the applicant can demonstrate in the wetlands report and the ~~Planning and Community Development Director~~Shoreline Administrator agrees that the variation will provide adequate compensation for lost wetland area, functions and values, or if other circumstances as determined by the ~~Planning and Community Development Department~~Shoreline Administrator justify the variation. The shoreline variance process shall be used to review any changes in recommended replacement ratios

(4) The qualified scientific professional in the wetlands report may, where feasible, recommend that restored or created wetlands shall be a higher wetland category than the altered wetland.

(d) The ~~Planning and Community Development Director~~Shoreline Administrator may increase the ratios under the following circumstances:

- (1) Uncertainty exists as to the probable success of the proposed restoration or creation; or
- (2) A significant period of time will elapse between impact and replication of wetland functions.

(e) All wetland restoration, creation and/or enhancement projects required pursuant to this ~~appendix chapter either as a permit condition or as the result of an enforcement action~~ shall follow a mitigation plan prepared in conformance to the requirements of Section 2.G, Mitigation/Enhancement Plan Requirements.

(f) Mitigation ratios for the replacement of impacted wetlands shall be as listed in Table 6-3. ~~However, Table 6-3 shall not apply to bogs, because it is not possible to create or restore bogs due to their unique chemistry and hydrology. Therefore, impacts to bogs are considered to be a loss of functions and shall be avoided.~~

6-3: Wetland Mitigation Ratios

Affected Wetland	Mitigation Type and Ratio				
Category	Re-establishment	Rehabilitation	Re-establishment or Creation (R/C)	Enhancement Only	

	or Wetland Creation		and Enhancement (E)		
Category IV	1.5:1	3:1	1:1 R/C and 2:1 E	6:1	<u>10:1</u>
Category III	2:1	4:1	1:1 R/C and 2:1 E	8:1	<u>15:1</u>
Category II	3:1	6:1	1:1 R/C and 4:1 E	12:1	<u>20:1</u>
Category I – Forested	6:1	12:1	1:1 R/C and 10:1 E	24:1	<u>24:1</u>
Category I – Score Based	4:1	8:1	1:1 R/C and 10:1 E	16:1	<u>20:1</u>
Category I – Bog, <u>Natural</u> <u>Heritage</u> <u>Site</u>	Not considered possible	N/A <u>6:1</u>	N/A	N/A	<u>10:1</u>



DEPARTMENT OF
ECOLOGY
State of Washington

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Western Washington Version

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For more information contact:

Shorelands and Environmental Assistance Program

P.O. Box 47600

Olympia, WA 98504-7600

Phone: 360-407-6600

Washington State Department of Ecology - www.ecy.wa.gov

- Headquarters, Olympia 360-407-6000
- Northwest Regional Office, Bellevue 425-649-7000
- Southwest Regional Office, Olympia 360-407-6300
- Central Regional Office, Yakima 509-575-2490
- Eastern Regional Office, Spokane 509-329-3400

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Wetlands & CAO Updates: Guidance for Small Cities

Western Washington Version

By

Donna Bunten, Andy McMillan, Rick Mraz, and Jeremy Sikes

Shorelands and Environmental Assistance Program
Washington State Department of Ecology
Olympia, Washington

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Introduction

This document is intended to provide guidance and tools useful in developing a wetland protection program for small cities and towns that are in the process of updating their critical areas ordinances (CAOs) to meet the Growth Management Act (GMA) requirements. Wetlands are one of the five types of critical areas identified in the GMA.

We recognize that many local governments lack the planning staff and resources necessary to develop and implement wetland standards that are both locally appropriate and based on best available science (BAS). Nonetheless, they must comply with the GMA requirement to designate and protect wetlands.

The first part of this document describes the important topics that should be addressed in the wetlands section of your CAO. It includes recommendations for wetland protection based on BAS. Appendix A is a sample CAO chapter for wetlands that incorporates these recommendations into a format similar to that found in many local CAOs. (Please note that the sample CAO will need to be tailored to your jurisdiction's naming and numbering system. There are several generic "XX" references throughout the text.) Appendix B contains definitions that are commonly used in wetlands regulations.

This document does not include the more general provisions typically found in regulations related to all critical areas. These can be found in Appendix A of the *Critical Areas Assistance Handbook* published by the Washington State Department of Commerce (formerly the Department of Community, Trade, and Economic Development) in November 2003 (<http://www.commerce.wa.gov/site/745/default.aspx>). This document revises the wetland-specific provisions in the *Critical Areas Assistance Handbook*.

The recommendations in this document and the sample ordinance may not be appropriate for use by rural **county** governments. Factors to consider are the county's rate of growth, the nature and intensity of land uses in the county, the wetland resources at risk, and the ability of the county to implement its CAO. We suggest that you contact us to determine whether this guidance is applicable to your county. Please use the following link to find Ecology's wetland specialist for your area:

<http://www.ecy.wa.gov/programs/sea/wetlands/contacts.htm>.

Guidance on the Science of Wetland Protection

Ecology has produced several different tools that can help local governments develop a comprehensive wetlands protection program for their jurisdictions. The Washington Departments of Ecology (Ecology) and Fish and Wildlife (WDFW) have published a two-volume guidance document to help local governments protect and manage wetlands:

- ***Wetlands in Washington State, Volume 1: A Synthesis of the Science*** (Washington State Department of Ecology Publication #05-06-006, Olympia, WA, March 2005). This volume is the result of an extensive search of over 15,000 scientific articles and synthesizes over 1,000 peer-reviewed works relevant to the management of Washington's wetlands.
- ***Wetlands in Washington State, Volume 2: Managing and Protecting Wetlands*** (Washington State Department of Ecology Publication # 05-06-008, Olympia, WA, April 2005). This volume was developed with the assistance of local government planners and wetland consultants. It can be used to craft regulatory language that is based on the best available science (BAS). We recommend that you review Chapter 8 and its appendices as you begin to work on updating your existing regulations.

Ecology, in coordination with the U.S. Army Corps of Engineers (Corps) and the U.S. Environmental Protection Agency (EPA), has also developed a two-part guidance document aimed at improving the quality and effectiveness of compensatory mitigation in Washington State:

- ***Wetland Mitigation in Washington State – Part 1: Agency Policies and Guidance (Version 1)***. (Washington State Department of Ecology Publication #06-06-011a, Olympia, WA, March 2006). Part 1 provides a brief background on wetlands, an overview of the factors that go into the agencies' permitting decisions, and detailed guidance on the agencies' policies of wetland mitigation, particularly compensatory mitigation. It outlines the information the agencies use to determine whether specific mitigation plans are appropriate and adequate.
- ***Wetland Mitigation in Washington State – Part 2: Developing Mitigation Plans (Version 1)***. (Washington State Department of Ecology Publication #06-06-011b, Olympia, WA, March 2006). Part 2 provides technical information on preparing plans for compensatory mitigation.

Ecology has also developed a wetland ratings system for western Washington. The rating system is a useful tool for dividing wetlands into groups that have similar needs for protection.

- ***Washington State Wetland Rating System for Western Washington – Revised*** (Washington State Department of Ecology Publication # 04-06-25, Olympia, WA, August 2004, annotated August 2006).

Links to all of these documents can be found at:

<http://www.ecy.wa.gov/programs/sea/wetlands/gma/index.html>.

Relationship of GMA and SMA

You may be planning to adopt a Shoreline Master Program (SMP) that will rely on the CAO for protection of wetlands and other critical areas in shoreline jurisdiction. Ecology does not have an approval role in the CAO adoption process; our role is advisory. The SMP, however, is a joint document of Ecology and the local government requiring Ecology approval. Before the SMP can be approved by Ecology, the CAO must meet the “no net loss of ecological functions” requirement (WAC 173-26-186(8)(b)(i)).

You should be aware that the Shoreline Management Act (SMA) may preclude or alter the administration of your CAO. For example, certain activities exempted under the CAO will not qualify for exemption under the SMP. In addition, activities allowed under the CAO may require permits under the SMP.

For assistance with CAO/SMP integration, please use the following link to find the shoreline planner for your area:

<http://www.ecy.wa.gov/programs/sea/sma/contacts/index.html>.

Policy Discussion for Your Wetlands Chapter

Your wetlands chapter will exist as one of several in your critical areas ordinance. Below we describe some of the important subsections in the wetlands chapter and include our recommendations for protecting wetlands based on the best available science.

Purpose

The chapter typically begins with a purpose statement, followed by designation criteria, which include a definition of wetlands and the methods by which they are identified and rated and other details listed below. The purpose statement may also state that this chapter is intended to be consistent with the requirements of 36.70A RCW and to implement the goals and policies of your Comprehensive Plan for protecting wetlands.

Definitions

Your wetlands chapter may include a separate list of definitions, or the definitions may be included in the general definitions section of the CAO. Appendix B is a list of definitions relevant to your wetlands chapter. This list includes terms identified in state law and agency guidance documents. Clarity and consistency in the use of these terms will make ordinance implementation easier.

Identifying, Designating, and Rating Wetlands

The first steps in regulating wetlands are to define what is being regulated and specify how these areas will be identified. The GMA requires the use of the following definition of wetlands and specifies how to identify and delineate them.

In designating wetlands for regulatory purposes, **counties and cities are required to use the definition of wetlands in RCW 36.70A.030 (21):**

“Wetland” or “wetlands” means areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands do not include those artificial wetlands intentionally created from non-wetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from non-wetland areas created to mitigate conversion of wetlands.

Wetlands are subject to a local government’s regulatory authority if they meet the criteria in this definition. This includes Prior Converted Croplands (PCCs) and isolated wetlands. These wetlands provide critical functions and habitat and should be regulated. **The GMA does not allow flexibility in adopting a modified definition of wetlands.**

Irrigation practices, such as the Irrigation District ditches in Sequim, can result in human-created, artificial wetlands. More frequently, however, irrigation practices may augment natural sources of water to a wetland. Wetlands that form along irrigation ditches that were intentionally created in uplands may be exempted from regulation. However, if a wetland is the unintentional by-product of irrigation activities, the wetland should be regulated. If a wetland disappears as the result of a change in irrigation practice, it will not be regulated in the future. However, most wetlands will not disappear completely as a result of local changes in irrigation practices because of natural sources of water or regional irrigation influences. Please see <http://www.ecy.wa.gov/programs/sea/wetlands/irrigation.html> for more information on how Ecology regulates irrigation-influenced wetlands.

Ecology is most concerned about those changes in land use that would eliminate wetlands as the result of fill or grading, such as a conversion to commercial or residential use. These activities should be regulated by the CAO, and appropriate protection standards (such as buffers and mitigation) should be required in order to prevent the loss of wetland area and function.

Many jurisdictions use the National Wetland Inventory (NWI) to determine whether wetlands exist within their boundaries. Since the NWI is based on photographs that are over 30 years old and provides only a general approximation of wetland location, it

cannot be used alone to designate wetlands. Wetlands are those areas that meet the above definition of “wetland.” Wetlands are also dynamic systems that change over time. It is important to adopt the GMA definition and to have regulations in place to protect wetland functions and values, should wetlands that do not currently appear on the NWI or other maps be identified in the future.

State legislation (RCW 36.70A.175 and WAC 173-22-080) also **requires local governments to use the *Washington State Wetlands Identification and Delineation Manual*** (Ecology Publication #96-94, March 1997) in implementing the GMA. The manual is used to identify the actual boundary of a wetland. The manual is based on the 1987 Corps of Engineers wetlands delineation manual and incorporates changes made by the Corps since 1987. Since the Washington state manual and the Corps manual rely upon the same criteria and indicators for hydrology, soils, and vegetation, proper use of either manual should result in the same wetland boundary.

The Corps recently released a draft version of the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (WMVCR)*. The Corps now requires that the draft version be applied to all delineations that require federal permits.

Once the WMVCR Supplement is formally approved and released by the Corps, you should require that qualified professionals use the state manual and the WMVCR in western Washington. Ecology will re-write the state manual to be consistent with the new federal supplements and any revisions to the 1987 manual. This will require revising the existing rule (WAC 173-22-080).

To simplify the submission of delineation forms, Ecology has adopted the same policy as the Corps and will accept the forms found in the supplement instead of the form in the state manual for the delineations. See:

<http://www.ecy.wa.gov/programs/sea/wetlands/delineation.html>.

Local governments are not required to rate or classify wetlands when regulating them. However, methods that classify, categorize, or rate wetlands help target the appropriate level of protection to particular types of wetlands and avoid the “one-size-fits-all” approach. If a local government uses a wetland rating system, it must consider the criteria described in WAC 365-190-090(3).

The *Washington State Wetland Rating System for Western Washington* (Revised, Ecology Publication #04-06-025, August 2004, annotated August 2006) is a useful tool for dividing wetlands into groups that have similar needs for protection. The revised rating system represents the best available science, as it is based on a better understanding of wetland functions, ways to evaluate them, and what is needed to protect them. It provides a quick “snapshot” characterization of a particular wetland. In many cases, it will provide enough information about existing wetland functions to allow adequate plan review and land use decisions to be made without the additional expense of a separate wetland functional assessment.

While local governments are not required to use Ecology's revised rating system, we strongly encourage you to adopt wetland regulations that require its use. Most qualified wetland specialists are using the revised rating system. In cases where state and federal permits are required, the use of this rating system would benefit applicants by eliminating the need to rate wetlands according to a different local standard. If you choose not to use the state's wetland rating system, you must provide a rationale for this decision according to WAC 365-190-090(3).

We recommend that you include language that describes the four categories of wetlands. This text is different for eastern and western Washington jurisdictions. Please refer to Appendix A, Section XX.020.B.1-4 for the specific category descriptions.

Regulated Uses and Activities

Your wetland section should list those uses and activities that are regulated under the critical areas ordinance. Some of these items include: removal, excavation, grading, or dredging of material of any kind; draining, flooding, or disturbing of the wetland, water level or water table; the construction, reconstruction, demolition, or expansion of any structure; etc. More extensive examples are provided in the sample ordinance.

Wetlands are often impacted by unauthorized **clearing and grading** that takes place before application for development permits. You should make sure your CAO adequately regulates clearing and grading. If it doesn't, you should adopt a separate clearing and grading ordinance. The Department of Commerce (formerly Community, Trade and Economic Development) recently published technical guidance on developing a clearing and grading ordinance:

http://www.commerce.wa.gov/CTED/documents/ID_2062_Publications.pdf.

Most forest practices (as defined in RCW 76.09) are exempted from the provisions of a wetlands chapter in the CAO. However, those forest practices that are Class IV general should be regulated. These activities constitute a conversion from forestry to some other use. As such, buffers and wetland protections are appropriate.

Exemptions

Your wetlands section should identify those activities in or near wetlands that are regulated and those that are exempt from regulation. Exemptions include activities that will have little or no environmental effect or are an emergency that threatens public health or safety. In the case of emergency response activities that affect wetlands and buffers, the responsible party should be required to obtain after-the-fact permits and to rectify impacts. Some jurisdictions place the exemptions or exceptions in a general exemptions section near the front of the CAO. However, some exemptions or exceptions may apply only to wetlands, so it may be more practical to have these specific exemptions in the wetlands section.

Exempt activities should be limited to those that will not have a significant impact on a wetland's structure and function (including its water, soil, or vegetation) and those which are expected to be very short term. Local governments should, however, also consider

the cumulative impacts from exempted activities. They can result in a loss of wetland acreage and function that are not replaced through compensatory mitigation.

The scope, coverage, and applicability of a critical areas ordinance should capture the full range of activities that are detrimental to wetland functions. Therefore, exemptions should be supported by the scientific literature and be carefully crafted to minimize the potential for adverse impacts. However, a local government should not assume that an exemption is appropriate in the absence of science to refute the exemption. The language should clearly state whether a given exemption is from applicable standards in the code or whether it is exempt from needing a permit but still must comply with the code. Exemptions should be limited and construed narrowly.

For more information on this topic please refer to Chapter 8 of *Wetlands in Washington State, Volume 2: Managing and Protecting Wetlands* (Ecology Publication # 05-06-008, Olympia, WA, April 2005, <http://www.ecy.wa.gov/biblio/0506008.html>).

The GMA, in RCW 36.70A.030(21), requires local governments to regulate wetlands that meet the definition of biological wetlands (see the definition of “wetland” in the following section). This includes **Prior Converted Croplands (PCCs)** and **hydrologically isolated wetlands**, two types of wetlands that have been exempt from federal regulation at times. PCCs are wetlands that have been ditched and drained for active agricultural use before December 23, 1985. Isolated wetlands are those wetlands that have no surface hydrologic connection to waters of the United States. These wetlands must be regulated by your CAO.

At the time of this writing, Congress is considering the Clean Water Restoration Act which, if passed into law, would restore federal jurisdiction over **all** wetlands and streams. This would eliminate the need for special state regulation of isolated wetlands. Please see <http://www.ecy.wa.gov/programs/sea/wetlands/isolated.html> for more information on how the state of Washington currently regulates isolated wetlands.

The scientific literature does not support exempting wetlands that are below a certain size. While we recognize an administrative desire to place size thresholds on wetlands that are to be regulated, you need to be aware that it is not possible to conclude from size alone what functions a particular wetland may be providing. However, Ecology has developed a strategy for exempting small wetlands when additional criteria are considered. This language is present in the sample ordinance.

Exceptions are typically addressed in a CAO in the context of reasonable use of property. For more information about this regulatory tool, see Section VII of the *Critical Areas Assistance Handbook* published by the Washington State Department of Commerce (<http://www.commerce.wa.gov/site/745/default.aspx>).

You should keep in mind that the Shoreline Management Act does not allow reasonable use exceptions, providing instead a variance pathway to afford regulatory relief. **If you**

decide to incorporate your CAO into your SMP when the latter document is updated, you will need to address this potential inconsistency.

Forest Practices

Class I, II, and III forest practices should be exempted from the wetlands section of your CAO. These activities are regulated through RCW 76.09, the Forest Practices Act.

Agricultural Activities

As of this writing, there is a moratorium on the adoption of new critical areas regulations with respect to agriculture. Substitute Senate Bill 5248 provides that for the period beginning May 1, 2007, and concluding July 1, 2010, counties and cities may not amend or adopt critical area ordinances under RCW 36.70A.060(2) as they specifically apply to agricultural activities. SSB 5248 designates the William D. Ruckelshaus Center as the facilitator in resolving, harmonizing, and advancing commonly held environmental protection and agricultural viability goals.

The future requirements of the GMA relating to agricultural activities will be unknown until the end of the 2010 legislative session.

According to SSB 5248, for CAO updates adopted between May 1, 2007, and July 1, 2010, this circumstance means:

- Your updated CAO cannot amend regulations as they apply to a broad category of “agricultural activities” as defined in SSB 5248.
- Your old CAO needs to remain in place – even if a new CAO is adopted – to regulate agricultural activities.
- Between July 1, 2010, and December 1, 2011, you will be required to “review and if necessary revise” CAO provisions related to agricultural activities (SSB 5248, Sec. 2(2)(b)).

During your current CAO update, issues regarding agricultural activities may come up. You should save documentation of issues and suggestions related to agricultural activities, even though they cannot be addressed at this time. Saving work from your current update may facilitate the post-July 2010 CAO review and potential update related to agricultural activities.

More information on SSB 5248 and the Ruckelshaus Center process is available at the Department of Commerce web site at:
<http://www.commerce.wa.gov/site/418/default.aspx>. Link to “Questions and Answers on SSB 5248.”

Strategies for Protecting Wetlands from Impacts

Wetlands Inventory

You may wish to pursue accurate identification and rating of all wetlands in your planning area based on the *Washington State Wetlands Identification and Delineation Manual* (Ecology Publication #96-94, or as revised) and the *Washington State Wetland Rating System for Western Washington* (Revised, Ecology Publication #04-06-025, August 2004). These documents can be downloaded at:

- <http://www.ecy.wa.gov/biblio/9694.html> (delineation manual)
- <http://www.ecy.wa.gov/biblio/0406025.html> (rating system).

While this approach may initially be more labor intensive and expensive, such information will allow rapid review of development proposals and can help your jurisdiction prioritize areas for preservation or acquisition.

This approach is consistent with best available science (BAS). It can help with the development of a landscape-analysis approach to protecting wetlands in your city. Landscape analysis for critical areas facilitates and informs long-range planning. The City of Aberdeen used this approach in their CAO update. (See Section XX.050.B in the sample ordinance.)

ABCs

The most basic approach to protecting wetland functions and values can be summarized as the **A-B-C Approach, or Avoid, Buffer, Compensate**. This means that a CAO should contain language to ensure that:

1. Wetlands impacts are **avoided** to the extent practicable.
2. Wetlands are **buffered** to protect them from adjacent land-use impacts.
3. Unavoidable impacts are **compensated**, or replaced.

Your CAO should provide requirements on how to reduce the severity of impacts to wetlands. When an alteration to a wetland is proposed, impacts should be avoided, minimized, or compensated for in the following sequential order of preference:

1. Avoiding the impact altogether by not taking a certain action or parts of an action;
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts;

3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;
5. Compensating for the impact by replacing, enhancing, or providing substitute resources or environments; and/or
6. Monitoring the impact and taking appropriate corrective measures.

Buffers

Establishing standards for wetland buffers is usually the most challenging part of developing a CAO. However, developing a predictable, reasonable approach for establishing buffers that includes the best available science is not as difficult as it may seem.

The scientific literature is unequivocal that **buffers are necessary to protect wetland functions** and values. The literature consistently reports that the primary factors to evaluate in determining appropriate buffer widths are:

1. The wetland type and functions needing protection (buffers filter sediment, nutrients, or toxics; screen noise and light; provide forage, nesting, or resting habitat for wetland-dependent species; etc.).
2. The types of adjacent land use and their expected impacts.
3. The characteristics of the buffer area (slope, soils, vegetation).

The widths of buffers needed vary widely, depending on these three factors. For example, providing filtration of coarse sediment from residential development next to a low-quality wetland would require only a relatively flat buffer of dense grasses or forest/shrub vegetation in the range of 20 to 30 feet. However, providing forage and nesting habitat for common wetland-dependent species such as waterfowl, herons, or amphibians in a high-quality wetland adjacent to residential development would require a buffer vegetated with trees and shrubs in the range of 200 to 300 feet. This illustrates the necessity of using an approach to buffers that incorporates wetland type and functions (based on an appropriate rating system), types of land use, and the environmental characteristics of the existing buffer.

Your CAO should require buffers for activities that will impact wetland functions. Ecology's buffer recommendations are presented in Appendix 8-C of *Wetlands in Washington State, Volume 2*. We recommend using the table shown in the sample ordinance. It is derived from the more detailed tables in Volume 2. It is a single table, is easy to use, and is based on BAS. This alternative provides the important balance of predictability and flexibility. Determination of buffer size is simply a matter of applying

the results of the wetland rating system score to the buffer matrix, based on the wetland category and wildlife habitat score. It generally requires smaller buffers for those wetlands that do not have much wildlife use. The simpler table does not consider land-use intensity in the buffer calculation, since it is presumed that most urban land uses will be high or moderate intensity. However, if your city has an activity that can be considered low intensity, such as a passive recreation area or nature park with undeveloped trails, you may wish to prescribe a smaller buffer **for that area only**. The buffer for an area should be no less than 75% of the otherwise required buffer. Such a “low-intensity” buffer is not appropriate for residential, commercial, or industrial uses.

Some wetland types listed in the buffer table may not be present in your city (e.g., coastal lagoons, bogs, interdunal wetlands, etc.). If you are certain that these wetlands do not occur within your jurisdiction and would not be introduced by future annexations, you may remove those wetland types from the buffer table.

You may wish to adopt an even simpler approach to wetland buffers, one based only on wetland category. In this case, buffers must be large enough to protect the most-sensitive wetlands from the most damaging land-use impacts. Please refer to Appendix 8-C of *Wetlands in Washington State, Volume 2* for these examples.

Ecology’s buffer recommendations are based on a moderate-risk approach to protecting wetland functions. This means that there is a moderate risk that wetland functions will be impacted. Adopting smaller buffers represents a high-risk approach, and you need to be prepared to justify why such an approach is necessary and to offer alternative means of protecting wetland functions that help reduce the risk.

Ecology’s buffer recommendations are also based on the assumption that the buffer is well vegetated with native species appropriate to the ecoregion. If the buffer does not consist of vegetation adequate to provide the necessary protection, then either the buffer area should be planted or the buffer width should be increased.

Buffer Averaging

Local governments often wish to allow buffer widths to be varied in certain circumstances. This may be reasonable if your standard buffers are adequate. The width of buffers may be averaged if this will improve the protection of wetland functions, or if it is the only way to allow for reasonable use of a parcel.

We recommend that a request for buffer averaging include a wetland report. The report should be prepared by a qualified professional describing the current functions of the wetland and its buffer and the measures that will be taken to ensure that there is no loss of wetland function due to the buffer averaging. The width of the buffer at any given point after averaging should be no smaller than 75% of the standard buffer.

If you choose to adopt small standard buffer widths, then further reductions to the buffer width should not be allowed under any circumstances.

Mitigation

Unavoidable **impacts to wetlands should be offset by compensatory mitigation**. Your CAO should include standards for the type, location, amount, and timing of the mitigation. It should also include clear guidance on the design considerations and reporting requirements for mitigation plans.

Ecology's recommendations for the amount of mitigation (ratios) are based on wetland category, function, and special characteristics. Requiring a greater area helps offset both the risk that compensatory mitigation will fail and the temporal loss of functions that may occur. We recommend using the ratio table shown in the sample ordinance. It is derived from the more detailed tables in Part 1 of the joint agency guidance on mitigation: *Wetland Mitigation in Washington State, Parts 1 and 2* (Ecology publications #06-06-011a & b, March 2006).

In 2008 the Corps and the EPA issued a rule governing compensatory mitigation. The rule establishes performance standards and criteria to improve the quality and success of compensatory mitigation, mitigation banks, and in-lieu fee programs. For more information on the federal rule, see:

http://www.epa.gov/owow/wetlands/pdf/wetlands_mitigation_final_rule_4_10_08.pdf.

By adopting mitigation standards based on the state and federal guidance and rules, you will be providing consistency for applicants who must also apply for state and federal permits.

Mitigation Alternatives

Various options are available for mitigation, in addition to the traditional on-site concurrent option. These options include placing the mitigation away from the project site (off-site mitigation), building mitigation in advance of project impacts, and using third-party mitigation providers such as wetland banks and in-lieu-fee programs. Deciding which option should be used depends on what works best for the applicant and for the environment. Some of these options may not be available in your area at this time. However, we recommend that your CAO allow these options. They can be effective and valuable tools in preventing a net loss of wetland functions.

Some project applicants may propose mitigation that is consistent with sound ecological principles but is located outside of your jurisdiction. You may wish to include language in your CAO that enables your government to establish interlocal agreements or similar instruments with other jurisdictions to allow for such mitigation opportunities.

In addition to the following options, you might want to consider allowing transfer of development rights (TDR) as a tool for protecting wetlands. The Department of Commerce is working with four Puget Sound counties in a pilot TDR program. For more information, contact the Commerce planner for your jurisdiction or see:

<http://www.commerce.wa.gov/site/1060/default.aspx>.

Mitigation Banking

A mitigation bank is a site where wetlands, streams, or other aquatic resource areas have been restored, established, enhanced, or (in certain circumstances) preserved for the purpose of providing compensation for unavoidable impacts to aquatic resources. A mitigation bank may be created by a government agency, corporation, nonprofit organization, or other entity. The bank sells its credits to permittees who are required to compensate for wetland impacts. Mitigation banks allow a permittee to simply write a check for their mitigation obligation. It is the bank owner who is responsible for the mitigation success. Mitigation banks require a formal agreement with the Corps, Ecology, and the local jurisdiction to be used for federal or state permits.

Ecology recently adopted the final Wetland Mitigation Banks Rule (WAC 173-700). The purpose of the rule is to provide a framework for the certification, operation and monitoring of wetland mitigation banks. To learn more about wetland banking and the rule, see Ecology's website at

<http://www.ecy.wa.gov/programs/sea/wetlands/mitigation/banking/index.html>.

In-Lieu Fee (ILF)

In this approach to mitigation, a permittee pays a fee to a third party in lieu of conducting project-specific mitigation or buying credits from a mitigation bank. ILF mitigation is used mainly to compensate for impacts to wetlands when better approaches to compensation are not available or practicable, or when the use of an ILF is in the best interest of the environment.

An ILF represents the expected costs to a third party of replacing the wetland functions lost or degraded as a result of the permittee's project. Fees are typically held in trust until sufficient funds have been collected to finance a mitigation project. Only a nonprofit organization such as a local land trust, private conservation group, or government agency with demonstrated competence in natural resource management may operate an ILF program. All ILF programs must be approved by the Corps to be used for Section 404 permits.

The Puget Sound Partnership (<http://www.psp.wa.gov>) is currently working with other entities to establish an ILF program in two pilot watersheds in Puget Sound. We will be posting information about this program on our Mitigation that Works web page at: <http://www.ecy.wa.gov/mitigation/options.html>

Off-Site Mitigation

This refers to compensatory mitigation that is not located at or near the project that generates impacts to wetlands. Off-site mitigation is generally allowed only when on-site mitigation is not practicable or environmentally preferable.

Ecology, the Corps of Engineers, and EPA have developed guidance to help applicants select potential off-site mitigation sites. To download a copy of *Selecting Wetland Mitigation Sites Using a Watershed Approach*, (Ecology Publication #09-06-032, December 2009), please see <http://www.ecy.wa.gov/biblio/0906032.html>.

Advance Mitigation

When compensatory mitigation is implemented before, and in anticipation of, future **known** impacts to wetlands, it is referred to as “advance mitigation.” Advance mitigation has been used mostly for large mitigation projects that are constructed in distinct phases where the impacts to wetlands are known. Advance mitigation lets an applicant provide all of the compensation needed for the entire project affecting wetlands at one time, which may result in more favorable mitigation ratios.

Although similar to mitigation banking, advance mitigation is different in several ways. Most importantly, advance mitigation is used only to compensate for a specific project (or projects) with pre-identified impacts to wetlands. Wetland banks provide mitigation for unknown future impacts within a specific “service” or market area. Ecology, WDFW, and the Corps of Engineers are developing guidance for advance mitigation. This guidance will be available by mid-2010. To obtain a copy after it is released, please see <http://www.ecy.wa.gov/mitigation/guidance.html>.

Conclusion

We hope you find this information helpful. If you have questions about this document or need additional assistance with the wetlands section of your critical areas ordinance update, please contact Donna Buntin at (360) 407-7172 or donna.buntin@ecy.wa.gov.

You may also contact one of Ecology’s regional wetland specialists. They are available to work with you during your update process. For example, they can offer presentations to elected officials and planning commissions. They can also provide technical assistance including help with wetland delineation, wetland rating, ordinary high water mark determination, and project review. Please use the following link to find the wetland specialist for your area:

<http://www.ecy.wa.gov/programs/sea/wetlands/contacts.htm>.

For assistance with other aspects of your critical areas ordinance update, please contact the Department of Commerce (formerly Community, Trade, and Economic Development) at (360) 725-3000.

Appendix A - Sample Wetlands Chapter

(Western Washington)

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Subchapter XX.XX Wetlands

Sections:

XX.010 Purpose
XX.020 Identification and Rating
XX.030 Regulated Activities
XX.040 Exemptions and Allowed Uses in Wetlands
XX.050 Wetland Buffers
XX.060 Critical Area Reports
XX.070 Compensatory Mitigation
XX.080 Unauthorized Alterations and Enforcement

XX.010 Purpose

The purposes of this Chapter are to:

A. Recognize and protect the beneficial functions performed by many wetlands, which include, but are not limited to, providing food, breeding, nesting and/or rearing habitat for fish and wildlife; recharging and discharging ground water; contributing to stream flow during low flow periods; stabilizing stream banks and shorelines; storing storm and flood waters to reduce flooding and erosion; and improving water quality through biofiltration, adsorption, and retention and transformation of sediments, nutrients, and toxicants.

B. Regulate land use to avoid adverse effects on wetlands and maintain the functions and values of wetlands throughout (name of jurisdiction).

C. Establish review procedures for development proposals in and adjacent to wetlands.

XX.020 Identification and Rating

A. Identification and Delineation. Wetlands shall be identified and delineated by a qualified wetland professional in accordance with the *Washington State Wetlands Identification and Delineation Manual* (Ecology Publication #96-94, or as revised and approved by Ecology), using the criteria in the definition of Chapter XX.XX. Wetland delineations are valid for five years; after such date the City shall determine whether a revision or additional assessment is necessary.

B. Rating. Wetlands shall be rated according to the Washington Department of Ecology wetland rating system, as set forth in the *Washington State Wetland Rating System for Western Washington* (Ecology Publication #04-06-025, or as revised and approved by Ecology), which contains the definitions and methods for determining whether the criteria below are met.

1. Category I. Category I wetlands are: (1) relatively undisturbed estuarine wetlands larger than 1 acre; (2) wetlands that are identified by scientists of the Washington Natural Heritage Program/DNR as high-quality wetlands; (3) bogs; (4) mature and old-growth forested wetlands larger than 1 acre; (5) wetlands in undisturbed coastal lagoons; and (6) wetlands that perform many functions well (scoring 70 points or more). These wetlands: (1) represent unique or rare wetland types; (2) are more sensitive to disturbance than most wetlands; (3) are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime; or (4) provide a high level of functions.
2. Category II. Category II wetlands are: (1) estuarine wetlands smaller than 1 acre, or disturbed estuarine wetlands larger than 1 acre; (2) interdunal wetlands larger than 1 acre; (3) disturbed coastal lagoons or (4) wetlands with a moderately high level of functions (scoring between 51 and 69 points).
3. Category III. Category III wetlands are: (1) wetlands with a moderate level of functions (scoring between 30 and 50 points); and (2) interdunal wetlands between 0.1 and 1 acre. Wetlands scoring between 30 and 50 points generally have been disturbed in some ways and are often less diverse or more isolated from other natural resources in the landscape than Category II wetlands.
4. Category IV. Category IV wetlands have the lowest levels of functions (scoring fewer than 30 points) and are often heavily disturbed. These are wetlands that we should be able to replace, or in some cases to improve. However, experience has shown that replacement cannot be guaranteed in any specific case. These wetlands may provide some important functions, and should be protected to some degree.

C. Illegal modifications. Wetland rating categories shall not change due to illegal modifications made by the applicant or with the applicant's knowledge.

XX.030 Regulated Activities

A. For any regulated activity, a critical areas report (see Chapter XX.060 of this Chapter) may be required to support the requested activity.

B. The following activities are regulated if they occur in a regulated wetland or its buffer:

1. The removal, excavation, grading, or dredging of soil, sand, gravel, minerals, organic matter, or material of any kind.
2. The dumping of, discharging of, or filling with any material.
3. The draining, flooding, or disturbing of the water level or water table.

4. Pile driving.
5. The placing of obstructions.
6. The construction, reconstruction, demolition, or expansion of any structure.
7. The destruction or alteration of wetland vegetation through clearing, harvesting, shading, intentional burning, or planting of vegetation that would alter the character of a regulated wetland.
8. "Class IV - General Forest Practices" under the authority of the "1992 Washington State Forest Practices Act Rules and Regulations," WAC 222-12-030, or as thereafter amended.
9. Activities that result in:
 - a. A significant change of water temperature.
 - b. A significant change of physical or chemical characteristics of the sources of water to the wetland.
 - c. A significant change in the quantity, timing, or duration of the water entering the wetland.
 - d. The introduction of pollutants.

C. Subdivisions. The subdivision and/or short subdivision of land in wetlands and associated buffers are subject to the following:

1. Land that is located wholly within a wetland or its buffer may not be subdivided.
2. Land that is located partially within a wetland or its buffer may be subdivided provided that an accessible and contiguous portion of each new lot is:
 - a. Located outside of the wetland and its buffer; and
 - b. Meets the minimum lot size requirements of Chapter XX.XX.

XX.040 Exemptions and Allowed Uses in Wetlands

A. The following wetlands are exempt from the buffer provisions contained in this Chapter and the normal mitigation sequencing process in Chapter XX.XX. They may be filled if impacts are fully mitigated based on provisions in Chapter XX.070. In order to verify the following conditions, a critical area report for wetlands meeting the requirements in Chapter XX.060 must be submitted.

1. All isolated Category III and IV wetlands less than 1,000 square feet that:

- a. Are not associated with riparian areas or buffers
- b. Are not part of a wetland mosaic
- c. Do not contain habitat identified as essential for local populations of priority species identified by the Washington Department of Fish and Wildlife or species of local importance identified in Chapter XX.XX.

B. Activities Allowed in Wetlands. The activities listed below are allowed in wetlands. These activities do not require submission of a critical area report, except where such activities result in a loss of the functions and values of a wetland or wetland buffer. These activities include:

1. Those activities and uses conducted pursuant to the Washington State Forest Practices Act and its rules and regulations, WAC 222-12-030, where state law specifically exempts local authority, except those developments requiring local approval for Class 4 – General Forest Practice Permits (conversions) as defined in RCW 76.09 and WAC 222-12.
2. Conservation or preservation of soil, water, vegetation, fish, shellfish, and/or other wildlife that does not entail changing the structure or functions of the existing wetland.
3. The harvesting of wild crops in a manner that is not injurious to natural reproduction of such crops and provided the harvesting does not require tilling of soil, planting of crops, chemical applications, or alteration of the wetland by changing existing topography, water conditions, or water sources.
4. Drilling for utilities/utility corridors under a wetland, with entrance/exit portals located completely outside of the wetland buffer, provided that the drilling does not interrupt the ground water connection to the wetland or percolation of surface water down through the soil column. Specific studies by a hydrologist are necessary to determine whether the ground water connection to the wetland or percolation of surface water down through the soil column will be disturbed.
5. Enhancement of a wetland through the removal of non-native invasive plant species. Removal of invasive plant species shall be restricted to hand removal unless permits from the appropriate regulatory agencies have been obtained for approved biological or chemical treatments. All removed plant material shall be taken away from the site and appropriately disposed of. Plants that appear on the Washington State Noxious Weed Control Board list of noxious weeds must be handled and disposed of according to a noxious weed control plan appropriate to that species. Re-

vegetation with appropriate native species at natural densities is allowed in conjunction with removal of invasive plant species.

6. Educational and scientific research activities.
7. Normal and routine maintenance and repair of any existing public or private facilities within an existing right-of-way, provided that the maintenance or repair does not expand the footprint of the facility or right-of-way.

XX.050 Wetland Buffers

A. Buffer Requirements. The standard buffer widths in Table XX.1 have been established in accordance with the best available science. They are based on the category of wetland and the habitat score as determined by a qualified wetland professional using the Washington state wetland rating system for western Washington.

Mathematical error in original document said "25% increase in width of all buffers is required." The correct % is 33.

1. The use of the standard buffer widths **requires** the implementation of the measures in Table XX.2, where applicable, to minimize the impacts of the adjacent land uses.
2. If an applicant chooses not to apply the mitigation measures in Table XX.2, then a 33% increase in the width of all buffers is required. For example, a 75-foot buffer with the mitigation measures would be a 100-foot buffer without them.
3. The standard buffer widths assume that the buffer is vegetated with a native plant community appropriate for the ecoregion. If the existing buffer is unvegetated, sparsely vegetated, or vegetated with invasive species that do not perform needed functions, the buffer should either be planted to create the appropriate plant community or the buffer should be widened to ensure that adequate functions of the buffer are provided.
4. Additional buffer widths are added to the standard buffer widths. For example, a Category I wetland scoring 32 points for habitat function would require a buffer of 225 feet (75 + 150).

Table XX.1 Wetland Buffer Requirements for Western Washington

Wetland Category	Standard Buffer Width	Additional buffer width if wetland scores 21-25 habitat points	Additional buffer width if wetland scores 26-29 habitat points	Additional buffer width if wetland scores 30-36 habitat points
Category I: Based on total score	75ft	Add 30 ft	Add 90 ft	Add 150 ft
Category I: Bogs	190 ft	NA	NA	Add 35 ft
Category I: Natural Heritage Wetlands	190 ft	N/A	NA	Add 35 ft
Category I: Coastal Lagoons	150 ft	N/A	Add 15 ft	Add 75 ft
Category I: Forested	75ft	Add 30 ft	Add 90 ft	Add 150 ft
Category I: Estuarine	150 ft	N/A	NA	N/A
Category II: Based on score	75 ft	Add 30 ft	Add 90 ft	Add 150 ft
Category II: Interdunal Wetlands	110 ft	NA	Add 55 ft	Add 115 ft
Category III (all)	60 ft	Add 45 ft	Add 105 ft	NA
Category IV (all)	40 ft	NA	NA	NA

Table XX.2 Required measures to minimize impacts to wetlands

(Measures are required, where applicable to a specific proposal)

Disturbance	Required Measures to Minimize Impacts
Lights	<ul style="list-style-type: none"> • Direct lights away from wetland
Noise	<ul style="list-style-type: none"> • Locate activity that generates noise away from wetland • If warranted, enhance existing buffer with native vegetation plantings adjacent to noise source • For activities that generate relatively continuous, potentially disruptive noise, such as certain heavy industry or mining, establish an additional 10' heavily vegetated buffer strip immediately adjacent to the outer wetland buffer
Toxic runoff	<ul style="list-style-type: none"> • Route all new, untreated runoff away from wetland while ensuring wetland is not dewatered • Establish covenants limiting use of pesticides within 150 ft of wetland • Apply integrated pest management
Stormwater runoff	<ul style="list-style-type: none"> • Retrofit stormwater detention and treatment for roads and existing adjacent development • Prevent channelized flow from lawns that directly enters the buffer • Use Low Intensity Development techniques (per PSAT publication on LID techniques)
Change in water regime	<ul style="list-style-type: none"> • Infiltrate or treat, detain, and disperse into buffer new runoff from impervious surfaces and new lawns
Pets and human disturbance	<ul style="list-style-type: none"> • Use privacy fencing OR plant dense vegetation to delineate buffer edge and to discourage disturbance using vegetation appropriate for the ecoregion • Place wetland and its buffer in a separate tract or protect with a conservation easement
Dust	<ul style="list-style-type: none"> • Use best management practices to control dust
Disruption of corridors or connections	<ul style="list-style-type: none"> • Maintain connections to offsite areas that are undisturbed • Restore corridors or connections to offsite habitats by replanting

5. Increased Wetland Buffer Area Width. Buffer widths shall be increased on a case-by-case basis as determined by the Administrator when a larger buffer is necessary to protect wetland functions and values. This determination shall be supported by appropriate documentation showing that it is reasonably related to protection of the functions and values of the wetland. The documentation must include but not be limited to the following criteria:
 - a. The wetland is used by a plant or animal species listed by the federal government or the state as endangered, threatened, candidate, sensitive, monitored or documented priority species or habitats, or essential or outstanding habitat for those species or has unusual nesting or resting sites such as heron rookeries or raptor nesting trees; or
 - b. The adjacent land is susceptible to severe erosion, and erosion-control measures will not effectively prevent adverse wetland impacts; or
 - c. The adjacent land has minimal vegetative cover or slopes greater than 30 percent.
6. Buffer averaging to *improve wetland protection* may be permitted when **all** of the following conditions are met:
 - a. The wetland has significant differences in characteristics that affect its habitat functions, such as a wetland with a forested component adjacent to a degraded emergent component or a “dual-rated” wetland with a Category I area adjacent to a lower-rated area.
 - b. The buffer is increased adjacent to the higher-functioning area of habitat or more-sensitive portion of the wetland and decreased adjacent to the lower-functioning or less-sensitive portion as demonstrated by a critical areas report from a qualified wetland professional.
 - c. The total area of the buffer after averaging is equal to the area required without averaging.
 - d. The buffer at its narrowest point is never less than either $\frac{3}{4}$ of the required width or 75 feet for Category I and II, 50 feet for Category III, and 25 feet for Category IV, whichever is greater.
7. Averaging to *allow reasonable use* of a parcel may be permitted when **all** of the following are met:

- a. There are no feasible alternatives to the site design that could be accomplished without buffer averaging.
- b. The averaged buffer will not result in degradation of the wetland's functions and values as demonstrated by a critical areas report from a qualified wetland professional.
- c. The total buffer area after averaging is equal to the area required without averaging.
- d. The buffer at its narrowest point is never less than either $\frac{3}{4}$ of the required width or 75 feet for Category I and II, 50 feet for Category III and 25 feet for Category IV, whichever is greater.

B. To facilitate long-range planning using a landscape approach, the Administrator may identify and pre-assess wetlands using the rating system and establish appropriate wetland buffer widths for such wetlands. The Administrator will prepare maps of wetlands that have been pre-assessed in this manner.

C. Measurement of Wetland Buffers. All buffers shall be measured perpendicular from the wetland boundary as surveyed in the field. The buffer for a wetland created, restored, or enhanced as compensation for approved wetland alterations shall be the same as the buffer required for the category of the created, restored, or enhanced wetland. Only fully vegetated buffers will be considered. Lawns, walkways, driveways, and other mowed or paved areas will not be considered buffers or included in buffer area calculations.

D. Buffers on Mitigation Sites. All mitigation sites shall have buffers consistent with the buffer requirements of this Chapter. Buffers shall be based on the expected or target category of the proposed wetland mitigation site.

E. Buffer Maintenance. Except as otherwise specified or allowed in accordance with this Chapter, wetland buffers shall be retained in an undisturbed or enhanced condition. In the case of compensatory mitigation sites, removal of invasive non-native weeds is required for the duration of the mitigation bond (Section XX.070.H.2.a.viii).

F. Impacts to Buffers. Requirements for the compensation for impacts to buffers are outlined in Section XX.070 of this Chapter.

G. Overlapping Critical Area Buffers. If buffers for two contiguous critical areas overlap (such as buffers for a stream and a wetland), the wider buffer applies.

H. Allowed Buffer Uses. The following uses may be allowed within a wetland buffer in accordance with the review procedures of this Chapter, provided they are not prohibited by any other applicable law and they are conducted in a manner so as to minimize impacts to the buffer and adjacent wetland:

1. Conservation and Restoration Activities. Conservation or restoration activities aimed at protecting the soil, water, vegetation, or wildlife.
2. Passive recreation. Passive recreation facilities designed and in accordance with an approved critical area report, including:
 - a. Walkways and trails, provided that those pathways are limited to minor crossings having no adverse impact on water quality. They should be generally parallel to the perimeter of the wetland, located only in the outer twenty-five percent (25%) of the wetland buffer area, and located to avoid removal of significant trees. They should be limited to pervious surfaces no more than five (5) feet in width for pedestrian use only. Raised boardwalks utilizing non-treated pilings may be acceptable.
 - b. Wildlife-viewing structures.
3. Educational and scientific research activities.
4. Normal and routine maintenance and repair of any existing public or private facilities within an existing right-of-way, provided that the maintenance or repair does not increase the footprint or use of the facility or right-of-way.
5. The harvesting of wild crops in a manner that is not injurious to natural reproduction of such crops and provided the harvesting does not require tilling of soil, planting of crops, chemical applications, or alteration of the wetland by changing existing topography, water conditions, or water sources.
6. Drilling for utilities/utility corridors under a buffer, with entrance/exit portals located completely outside of the wetland buffer boundary, provided that the drilling does not interrupt the ground water connection to the wetland or percolation of surface water down through the soil column. Specific studies by a hydrologist are necessary to determine whether the ground water connection to the wetland or percolation of surface water down through the soil column is disturbed.
7. Enhancement of a wetland buffer through the removal of non-native invasive plant species. Removal of invasive plant species shall be restricted to hand removal. All removed plant material shall be taken away from the site and appropriately disposed of. Plants that appear on the Washington State Noxious Weed Control Board list of noxious weeds must be handled and disposed of according to a noxious weed control plan appropriate to that species. Revegetation with appropriate native species at natural densities is allowed in conjunction with removal of invasive plant species.

8. Stormwater management facilities. Stormwater management facilities are limited to stormwater dispersion outfalls and bioswales. They may be allowed within the outer twenty-five percent (25%) of the buffer of Category III or IV wetlands only, provided that:
 - a. No other location is feasible; and
 - b. The location of such facilities will not degrade the functions or values of the wetland; and
 - c. Stormwater management facilities are not allowed in buffers of Category I or II wetlands.
 9. Non-Conforming Uses. Repair and maintenance of non-conforming uses or structures, where legally established within the buffer, provided they do not increase the degree of nonconformity.
- I. Signs and Fencing of Wetlands and Buffers:
1. Temporary markers. The outer perimeter of the wetland buffer and the clearing limits identified by an approved permit or authorization shall be marked in the field with temporary “clearing limits” fencing in such a way as to ensure that no unauthorized intrusion will occur. The marking is subject to inspection by the Administrator prior to the commencement of permitted activities. This temporary marking shall be maintained throughout construction and shall not be removed until permanent signs, if required, are in place.
 2. Permanent signs. As a condition of any permit or authorization issued pursuant to this Chapter, the Administrator may require the applicant to install permanent signs along the boundary of a wetland or buffer.
 - a. Permanent signs shall be made of an enamel-coated metal face and attached to a metal post or another non-treated material of equal durability. Signs must be posted at an interval of one (1) per lot or every fifty (50) feet, whichever is less, and must be maintained by the property owner in perpetuity. The signs shall be worded as follows or with alternative language approved by the Administrator:

**Protected Wetland Area
Do Not Disturb
Contact [Local Jurisdiction]
Regarding Uses, Restrictions, and Opportunities for Stewardship**

- b. The provisions of Subsection (a) may be modified as necessary to assure protection of sensitive features or wildlife.

3. Fencing

- a. The applicant shall be required to install a permanent fence around the wetland or buffer when domestic grazing animals are present or may be introduced on site.
- b. Fencing installed as part of a proposed activity or as required in this Subsection shall be designed so as to not interfere with species migration, including fish runs, and shall be constructed in a manner that minimizes impacts to the wetland and associated habitat.

XX.060 Critical Area Report for Wetlands

A. If the Administrator determines that the site of a proposed development includes, is likely to include, or is adjacent to a wetland, a wetland report, prepared by a qualified professional, shall be required. The expense of preparing the wetland report shall be borne by the applicant.

B. Minimum Standards for Wetland Reports. The written report and the accompanying plan sheets shall contain the following information, at a minimum:

1. The written report shall include at a minimum:
 - a. The name and contact information of the applicant; the name, qualifications, and contact information for the primary author(s) of the wetland critical area report; a description of the proposal; identification of all the local, state, and/or federal wetland-related permit(s) required for the project; and a vicinity map for the project.
 - b. A statement specifying the accuracy of the report and all assumptions made and relied upon.
 - c. Documentation of any fieldwork performed on the site, including field data sheets for delineations, rating system forms, baseline hydrologic data, etc.
 - d. A description of the methodologies used to conduct the wetland delineations, rating system forms, or impact analyses including references.
 - e. Identification and characterization of all critical areas, wetlands, water bodies, shorelines, floodplains, and buffers on or adjacent to the proposed project area. For areas off site of the project site, estimate conditions within 300 feet of the project boundaries using the best available information.

- f. For each wetland identified on site and within 300 feet of the project site provide: the wetland rating, including a description of and score for each function, per *Wetland Ratings* (Section XX.020.B) of this Chapter; required buffers; hydrogeomorphic classification; wetland acreage based on a professional survey from the field delineation (acres for on-site portion and entire wetland area including off-site portions); Cowardin classification of vegetation communities; habitat elements; soil conditions based on site assessment and/or soil survey information; and to the extent possible, hydrologic information such as location and condition of inlet/outlets (if they can be legally accessed), estimated water depths within the wetland, and estimated hydroperiod patterns based on visual cues (e.g., algal mats, drift lines, flood debris, etc.). Provide acreage estimates, classifications, and ratings based on entire wetland complexes, not only the portion present on the proposed project site.
 - g. A description of the proposed actions, including an estimation of acreages of impacts to wetlands and buffers based on the field delineation and survey and an analysis of site development alternatives, including a no-development alternative.
 - h. An assessment of the probable cumulative impacts to the wetlands and buffers resulting from the proposed development.
 - i. A description of reasonable efforts made to apply mitigation sequencing pursuant to *Mitigation Sequencing* (Chapter XX.XX) to avoid, minimize, and mitigate impacts to critical areas.
 - j. A discussion of measures, including avoidance, minimization, and compensation, proposed to preserve existing wetlands and restore any wetlands that were degraded prior to the current proposed land-use activity.
 - k. A conservation strategy for habitat and native vegetation that addresses methods to protect and enhance on-site habitat and wetland functions.
 - l. An evaluation of the functions of the wetland and adjacent buffer. Include reference for the method used and data sheets.
2. A copy of the site plan sheet(s) for the project must be included with the written report and must include, at a minimum:
- a. Maps (to scale) depicting delineated and surveyed wetland and required buffers on site, including buffers for off-site critical areas that extend onto the project site; the development proposal; other critical

areas; grading and clearing limits; areas of proposed impacts to wetlands and/or buffers (include square footage estimates).

- b. A depiction of the proposed stormwater management facilities and outlets (to scale) for the development, including estimated areas of intrusion into the buffers of any critical areas. The written report shall contain a discussion of the potential impacts to the wetland(s) associated with anticipated hydroperiod alterations from the project.

XX.070 Compensatory Mitigation

A. Mitigation Sequencing. Before impacting any wetland or its buffer, an applicant shall demonstrate that the following actions have been taken. Actions are listed in the order of preference:

1. Avoid the impact altogether by not taking a certain action or parts of an action.
2. Minimize impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts.
3. Rectify the impact by repairing, rehabilitating, or restoring the affected environment.
4. Reduce or eliminate the impact over time by preservation and maintenance operations.
5. Compensate for the impact by replacing, enhancing, or providing substitute resources or environments.
6. Monitor the required compensation and take remedial or corrective measures when necessary.

B. Requirements for Compensatory Mitigation:

1. Compensatory mitigation for alterations to wetlands shall be used only for impacts that cannot be avoided or minimized and shall achieve equivalent or greater biologic functions. Compensatory mitigation plans shall be consistent with *Wetland Mitigation in Washington State – Part 2: Developing Mitigation Plans (Version 1)*, Ecology Publication #06-06-011b, Olympia, WA, March 2006 or as revised.
2. Mitigation ratios shall be consistent with Subsection G of this Chapter.

C. Compensating for Lost or Affected Functions. Compensatory mitigation shall address the functions affected by the proposed project, with an intention to achieve functional equivalency or improvement of functions. The goal shall be for the compensatory mitigation to provide similar wetland functions as those lost, except when either:

1. The lost wetland provides minimal functions, and the proposed compensatory mitigation action(s) will provide equal or greater functions or will provide functions shown to be limiting within a watershed through a formal Washington state watershed assessment plan or protocol; or
2. Out-of-kind replacement of wetland type or functions will best meet watershed goals formally identified by the City, such as replacement of historically diminished wetland types.

D. Preference of Mitigation Actions. Methods to achieve compensation for wetland functions shall be approached in the following order of preference:

1. Restoration (re-establishment and rehabilitation) of wetlands.
2. Creation (establishment) of wetlands on disturbed upland sites such as those with vegetative cover consisting primarily of non-native species. This should be attempted only when there is an adequate source of water and it can be shown that the surface and subsurface hydrologic regime is conducive to the wetland community that is anticipated in the design.
3. Enhancement of significantly degraded wetlands in combination with restoration or creation. Enhancement alone will result in a loss of wetland acreage and is less effective at replacing the functions lost. Enhancement should be part of a mitigation package that includes replacing the impacted area and meeting appropriate ratio requirements.
4. Preservation. Preservation of high-quality, at-risk wetlands as compensation is generally acceptable when done in combination with restoration, creation, or enhancement, provided that a minimum of 1:1 acreage replacement is provided by re-establishment or creation.

Preservation of high-quality, at risk wetlands and habitat may be considered as the sole means of compensation for wetland impacts when the following criteria are met:

- a. Wetland impacts will not have a significant adverse impact on habitat for listed fish, or other ESA listed species.
- b. There is no net loss of habitat functions within the watershed or basin.
- c. Mitigation ratios for preservation as the sole means of mitigation shall generally start at 20:1. Specific ratios should depend upon the significance of the preservation project and the quality of the wetland resources lost.

- d. The impact area is small (generally <1/2acre) and/or impacts are occurring to a low-functioning system (Category III or IV wetland).

All preservation sites shall include buffer areas adequate to protect the habitat and its functions from encroachment and degradation.

E. Type and Location of Compensatory Mitigation. Unless it is demonstrated that a higher level of ecological functioning would result from an alternative approach, compensatory mitigation for ecological functions shall be either in kind and on site, or in kind and within the same stream reach, sub-basin, or drift cell (if estuarine wetlands are impacted). Compensatory mitigation actions shall be conducted within the same sub-drainage basin and on the site of the alteration except when all of the following apply:

1. There are no reasonable opportunities on site or within the sub-drainage basin (e.g., on-site options would require elimination of high-functioning upland habitat), or opportunities on site or within the sub-drainage basin do not have a high likelihood of success based on a determination of the capacity of the site to compensate for the impacts. Considerations should include: anticipated replacement ratios for wetland mitigation, buffer conditions and proposed widths, available water to maintain anticipated hydrogeomorphic classes of wetlands when restored, proposed flood storage capacity, and potential to mitigate riparian fish and wildlife impacts (such as connectivity);
2. Off-site mitigation has a greater likelihood of providing equal or improved wetland functions than the impacted wetland; and
3. Off-site locations shall be in the same sub-drainage basin unless:
 - a. Established watershed goals for water quality, flood storage or conveyance, habitat, or other wetland functions have been established by the City and strongly justify location of mitigation at another site; or
 - b. Credits from a state-certified wetland mitigation bank are used as compensation, and the use of credits is consistent with the terms of the bank's certification.
4. The design for the compensatory mitigation project needs to be appropriate for its location (i.e., position in the landscape). Therefore, compensatory mitigation should not result in the creation, restoration, or enhancement of an atypical wetland. An atypical wetland refers to a compensation wetland (e.g., created or enhanced) that does not match the type of existing wetland that would be found in the geomorphic setting of the site (i.e., the water source(s) and hydroperiod proposed for the mitigation site are not typical for the geomorphic setting). Likewise, it should not provide exaggerated morphology or require a berm or other engineered structures to hold back water. For example, excavating a

permanently inundated pond in an existing seasonally saturated or inundated wetland is one example of an enhancement project that could result in an atypical wetland. Another example would be excavating depressions in an existing wetland on a slope, which would require the construction of berms to hold the water.

F. Timing of Compensatory Mitigation. It is preferred that compensatory mitigation projects be completed prior to activities that will disturb wetlands. At the least, compensatory mitigation shall be completed immediately following disturbance and prior to use or occupancy of the action or development. Construction of mitigation projects shall be timed to reduce impacts to existing fisheries, wildlife, and flora.

1. The Administrator may authorize a one-time temporary delay in completing construction or installation of the compensatory mitigation when the applicant provides a written explanation from a qualified wetland professional as to the rationale for the delay. An appropriate rationale would include identification of the environmental conditions that could produce a high probability of failure or significant construction difficulties (e.g., project delay lapses past a fisheries window, or installing plants should be delayed until the dormant season to ensure greater survival of installed materials). The delay shall not create or perpetuate hazardous conditions or environmental damage or degradation, and the delay shall not be injurious to the health, safety, or general welfare of the public. The request for the temporary delay must include a written justification that documents the environmental constraints that preclude implementation of the compensatory mitigation plan. The justification must be verified and approved by the City.

G. Wetland Mitigation Ratios:

Category and Type of Wetland	Creation or Re-establishment	Rehabilitation	Enhancement	Preservation
Category I: Bog, Natural Heritage site	Not considered possible	6:1	Case by case	10:1
Category I: Mature Forested	6:1	12:1	24:1	24:1
Category I: Based on functions	4:1	8:1	16:1	20:1
Category II	3:1	6:1	12:1	20:1
Category III	2:1	4:1	8:1	15:1
Category IV	1.5:1	3:1	6:1	10:1

H. Compensatory Mitigation Plan. When a project involves wetland and/or buffer impacts, a compensatory mitigation plan prepared by a qualified professional shall be required, meeting the following minimum standards:

1. Wetland Critical Area Report. A critical area report for wetlands must accompany or be included in the compensatory mitigation plan and include the minimum parameters described in *Minimum Standards for Wetland Reports* (Section XX.060.B) of this Chapter.
2. Compensatory Mitigation Report. The report must include a written report and plan sheets that must contain, at a minimum, the following elements. Full guidance can be found in *Wetland Mitigation in Washington State—Part 2: Developing Mitigation Plans (Version 1)* (Ecology Publication #06-06-011b, Olympia, WA, March 2006 or as revised).
 - a. The written report must contain, at a minimum:
 - i. The name and contact information of the applicant; the name, qualifications, and contact information for the primary author(s) of the compensatory mitigation report; a description of the proposal; a summary of the impacts and proposed compensation concept; identification of all the local, state, and/or federal

- wetland-related permit(s) required for the project; and a vicinity map for the project.
- ii. Description of how the project design has been modified to avoid, minimize, or reduce adverse impacts to wetlands.
 - iii. Description of the existing wetland and buffer areas proposed to be impacted. Include acreage (or square footage), water regime, vegetation, soils, landscape position, surrounding lands uses, and functions. Also describe impacts in terms of acreage by Cowardin classification, hydrogeomorphic classification, and wetland rating, based on *Wetland Ratings* (Section XX.020.B) of this Chapter.
 - iv. Description of the compensatory mitigation site, including location and rationale for selection. Include an assessment of existing conditions: acreage (or square footage) of wetlands and uplands, water regime, sources of water, vegetation, soils, landscape position, surrounding land uses, and functions. . Estimate future conditions in this location if the compensation actions are NOT undertaken (i.e., how would this site progress through natural succession?).
 - v. A description of the proposed actions for compensation of wetland and upland areas affected by the project. Include overall goals of the proposed mitigation, including a description of the targeted functions, hydrogeomorphic classification, and categories of wetlands.
 - vi. A description of the proposed mitigation construction activities and timing of activities.
 - vii. A discussion of ongoing management practices that will protect wetlands after the project site has been developed, including proposed monitoring and maintenance programs (for remaining wetlands and compensatory mitigation wetlands).
 - viii. A bond estimate for the entire compensatory mitigation project, including the following elements: site preparation, plant materials, construction materials, installation oversight, maintenance twice per year for up to five (5) years, annual monitoring field work and reporting, and contingency actions for a maximum of the total required number of years for monitoring.
 - ix. Proof of establishment of Notice on Title for the wetlands and buffers on the project site, including the compensatory mitigation areas.
- b. The scaled plan sheets for the compensatory mitigation must contain, at a minimum:

- i. Surveyed edges of the existing wetland and buffers, proposed areas of wetland and/or buffer impacts, location of proposed wetland and/or buffer compensation actions.
- ii. Existing topography, ground-proofed, at two-foot contour intervals in the zone of the proposed compensation actions if any grading activity is proposed to create the compensation area(s). Also existing cross-sections of on-site wetland areas that are proposed to be impacted, and cross-section(s) (estimated one-foot intervals) for the proposed areas of wetland or buffer compensation.
- iii. Surface and subsurface hydrologic conditions, including an analysis of existing and proposed hydrologic regimes for enhanced, created, or restored compensatory mitigation areas. Also, illustrations of how data for existing hydrologic conditions were used to determine the estimates of future hydrologic conditions.
- iv. Conditions expected from the proposed actions on site, including future hydrogeomorphic types, vegetation community types by dominant species (wetland and upland), and future water regimes.
- v. Required wetland buffers for existing wetlands and proposed compensation areas. Also, identify any zones where buffers are proposed to be reduced or enlarged outside of the standards identified in this Chapter.
- vi. A plant schedule for the compensation area, including all species by proposed community type and water regime, size and type of plant material to be installed, spacing of plants, typical clustering patterns, total number of each species by community type, timing of installation.
- vii. Performance standards (measurable standards reflective of years post-installation) for upland and wetland communities, monitoring schedule, and maintenance schedule and actions by each biennium.

I. Buffer Mitigation Ratios. Impacts to buffers shall be mitigated at a 1:1 ratio. Compensatory buffer mitigation shall replace those buffer functions lost from development.

J. Wetland Mitigation Banks.

1. Credits from a wetland mitigation bank may be approved for use as compensation for unavoidable impacts to wetlands when:
 - a. The bank is certified under state rules;
 - b. The Administrator determines that the wetland mitigation bank provides appropriate compensation for the authorized impacts; and
 - c. The proposed use of credits is consistent with the terms and conditions of the bank's certification.
2. Replacement ratios for projects using bank credits shall be consistent with replacement ratios specified in the bank's certification.
3. Credits from a certified wetland mitigation bank may be used to compensate for impacts located within the service area specified in the bank's certification. In some cases, the service area of the bank may include portions of more than one adjacent drainage basin for specific wetland functions.

K. In-Lieu Fee. To aid in the implementation of off-site mitigation, the City may develop a program which prioritizes wetland areas for use as mitigation and/or allows payment in lieu of providing mitigation on a development site. This program shall be developed and approved through a public process and be consistent with state and federal rules. The program should address:

1. The identification of sites within the City that are suitable for use as off-site mitigation. Site suitability shall take into account wetland functions, potential for wetland degradation, and potential for urban growth and service expansion, and
2. The use of fees for mitigation on available sites that have been identified as suitable and prioritized.

L. Advance Mitigation. Mitigation for projects with pre-identified impacts to wetlands may be constructed in advance of the impacts if the mitigation is implemented according to state and federal rules.

XX.080 Unauthorized Alterations and Enforcement

A. When a wetland or its buffer has been altered in violation of this Chapter, all ongoing development work shall stop, and the critical area shall be restored. The City shall have the authority to issue a “stop-work” order to cease all ongoing development work and order restoration, rehabilitation, or replacement measures at the owner’s or other responsible party’s expense to compensate for violation of provisions of this Chapter.

B. Requirement for Restoration Plan. All development work shall remain stopped until a restoration plan is prepared and approved by the City. Such a plan shall be prepared by a qualified professional using the currently accepted scientific principles and shall describe how the actions proposed meet the minimum requirements described in Subsection (C). The Administrator shall, at the violator’s expense, seek expert advice in determining the adequacy of the plan. Inadequate plans shall be returned to the applicant or violator for revision and resubmittal.

C. Minimum Performance Standards for Restoration. The following minimum performance standards shall be met for the restoration of a wetland, provided that if the violator can demonstrate that greater functions and habitat values can be obtained, these standards may be modified:

1. The historic structure, functions, and values of the affected wetland shall be restored, including water quality and habitat functions.
2. The historic soil types and configuration shall be restored to the extent practicable.
3. The wetland and buffers shall be replanted with native vegetation that replicates the vegetation historically found on the site in species types, sizes, and densities. The historic functions and values should be replicated at the location of the alteration.
4. Information demonstrating compliance with other applicable provisions of this Chapter shall be submitted to the Administrator.

D. Site Investigations. The Administrator is authorized to make site inspections and take such actions as are necessary to enforce this Chapter. The Administrator shall present proper credentials and make a reasonable effort to contact any property owner before entering onto private property.

E. Penalties. Any person, party, firm, corporation, or other legal entity convicted of violating any of the provisions of this Chapter shall be guilty of a misdemeanor.

1. Each day or portion of a day during which a violation of this Chapter is committed or continued shall constitute a separate offense. Any development carried out contrary to the provisions of this Chapter shall constitute a public nuisance and may be enjoined as provided by the statutes of the state of Washington. The City may levy civil penalties

against any person, party, firm, corporation, or other legal entity for violation of any of the provisions of this Chapter. The civil penalty shall be assessed at a maximum rate of \$XX dollars per day per violation.

2. If the wetland affected cannot be restored, monies collected as penalties shall be deposited in a dedicated account for the preservation or restoration of landscape processes and functions in the watershed in which the affected wetland is located. The City may coordinate its preservation or restoration activities with other cities in the watershed to optimize the effectiveness of the restoration action.

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Appendix B - Wetland Definitions

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Appendix B – Wetland Definitions

Alteration – Any human-induced change in an existing condition of a critical area or its buffer. Alterations include, but are not limited to, grading, filling, channelizing, dredging, clearing of vegetation, construction, compaction, excavation, or any other activity that changes the character of the critical area.

Best Available Science – Current scientific information used in the process to designate, protect, or restore critical areas, that is, derived from a valid scientific process as defined by WAC 365-195-900 through 925. Examples of best available science are included in *Citations of Recommended Sources of Best Available Science for Designating and Protecting Critical Areas* published by the Washington State Department of Commerce.

Best Management Practices (BMPs) – Conservation practices or systems of practices and management measures that:

- (a) Control soil loss and reduce water quality degradation caused by high concentrations of nutrients, animal waste, toxics, or sediment;
- (b) Minimize adverse impacts to surface water and ground water flow and circulation patterns and to the chemical, physical, and biological characteristics of wetlands;
- (c) Protect trees, vegetation and soils designated to be retained during and following site construction and use native plant species appropriate to the site for re-vegetation of disturbed areas; and
- (d) Provide standards for proper use of chemical herbicides within critical areas.

Bog – A low-nutrient, acidic wetland with organic soils and characteristic bog plants, which is sensitive to disturbance and impossible to re-create through compensatory mitigation.

Buffer or Buffer Zone – The area contiguous with a critical area that maintains the functions and/or structural stability of the critical area.

Critical Areas – Critical areas include any of the following areas or ecosystems: critical aquifer recharge areas, fish and wildlife habitat conservation areas, geologically hazardous areas, frequently flooded areas, and wetlands, as defined in RCW 36.70A and this Chapter.

Creation – The manipulation of the physical, chemical, or biological characteristics to develop a wetland on an upland or deepwater site, where a wetland did not previously exist. Creation results in a gain in wetland acreage and function. A typical action is the excavation of upland soils to elevations that will produce a wetland *hydroperiod* and hydric soils, and support the growth of hydrophytic plant species.

Cumulative Impacts or Effects – The combined, incremental effects of human activity on ecological or critical area functions and values. Cumulative impacts result when the effects of an action are added to or interact with the effects of other actions in a particular place and within a particular time. It is the combination of these effects, and any resulting environmental degradation, that should be the focus of cumulative impact analysis and changes to policies and permitting decisions.

Developable Area – A site or portion of a site that may be used as the location of development, in accordance with the rules of this Chapter.

Development – A land use consisting of the construction or exterior alteration of structures; grading, dredging, drilling, or dumping; filling; removal of sand, gravel, or minerals; bulk heading; driving of pilings; or any project of a temporary or permanent nature which modifies structures, land, or shorelines and which does not fall within the allowable exemptions contained in the City Code.

Enhancement – The manipulation of the physical, chemical, or biological characteristics of a wetland to heighten, intensify, or improve specific function(s) or to change the growth stage or composition of the vegetation present. Enhancement is undertaken for specified purposes such as water quality improvement, flood water retention, or wildlife habitat. Enhancement results in a change in wetland function(s) and can lead to a decline in other wetland functions, but does not result in a gain in wetland acres. Examples are planting vegetation, controlling non-native or invasive species, and modifying site elevations to alter hydroperiods.

Functions and Values – The services provided by critical areas to society, including, but not limited to, improving and maintaining water quality, providing fish and wildlife habitat, supporting terrestrial and aquatic food chains, reducing flooding and erosive flows, wave attenuation, historical or archaeological importance, educational opportunities, and recreation.

Growth Management Act – RCW 36.70A and 36.70B, as amended.

Hazardous Substances – Any liquid, solid, gas, or sludge, including any material, substance, product, commodity, or waste, regardless of quantity, that exhibits any of the physical, chemical, or biological properties described in WAC 173-303-090 or 173-303-100.

Historic Condition – Condition of the land, including flora, fauna, soil, topography, and hydrology that existed before the area and vicinity were developed or altered by Euro-American settlement, or in some cases before any human habitation occurred.

Impervious Surface – Any alterations to the surface of a soil that prevents or retards the entry of water into it compared to its undisturbed condition, or any reductions in infiltration that cause water to run off the surface in greater quantities or at an increased rate of flow compared to that present prior to development. Common impervious surfaces include, but are not limited to, rooftops, walkways, patios, driveways, parking

lots or storage areas, concrete or asphalt paving, gravel roads, packed earthen materials, and oiled macadam or other surfaces which similarly impede the natural infiltration of stormwater.

In-Kind Compensation – To replace critical areas with substitute areas whose characteristics and functions closely approximate those destroyed or degraded by a regulated activity.

In-Lieu-Fee Program – An agreement between a regulatory agency (state, federal, or local) and a single sponsor, generally a public agency or non-profit organization. Under an in-lieu-fee agreement, the mitigation sponsor collects funds from an individual or a number of individuals who are required to conduct compensatory mitigation required under a wetland regulatory program. The sponsor may use the funds pooled from multiple permittees to create one or a number of sites under the authority of the agreement to satisfy the permittees' required mitigation.

Infiltration – The downward entry of water into the immediate surface of soil.

Isolated Wetlands – Those wetlands that are outside of and not contiguous to any 100-year floodplain of a lake, river, or stream and have no contiguous hydric soil or hydrophytic vegetation between the wetland and any surface water, including other wetlands.

Mature Forested Wetland – A wetland where at least one acre of the wetland surface is covered by woody vegetation greater than 20 feet in height with a crown cover of at least 30 percent and where at least 8 trees/acre are 80 to 200 years old OR have average diameters (dbh) exceeding 21 inches (53 centimeters) measured from the uphill side of the tree trunk at 4.5 feet up from the ground.

Mitigation – Avoiding, minimizing, or compensating for adverse critical areas impacts. Mitigation, in the following sequential order of preference, is:

- (a) Avoiding the impact altogether by not taking a certain action or parts of an action;
- (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps, such as project redesign, relocation, or timing, to avoid or reduce impacts;
- (c) Rectifying the impact to wetlands, critical aquifer recharge areas, and habitat conservation areas by repairing, rehabilitating, or restoring the affected environment to the conditions existing at the time of the initiation of the project;
- (d) Minimizing or eliminating a hazard by restoring or stabilizing the hazard area through engineered or other methods;

- (e) Reducing or eliminating the impact or hazard over time by preservation and maintenance operations during the life of the action;
- (f) Compensating for the impact to wetlands, critical aquifer recharge areas, and habitat conservation areas by replacing, enhancing, or providing substitute resources or environments; and
- (g) Monitoring the hazard or other required mitigation and taking remedial action when necessary.

Mitigation for individual actions may include a combination of the above measures.

Monitoring – Evaluating the impacts of development proposals on the biological, hydrological, and geological elements of such systems, and assessing the performance of required mitigation measures through the collection and analysis of data by various methods for the purpose of understanding and documenting changes in natural ecosystems and features. Monitoring includes gathering baseline data.

Native Vegetation – Plant species that occur naturally in a particular region or environment and were not introduced by human activities.

Off-Site Compensation – To replace critical areas away from the site on which a critical area has been impacted.

On-Site Compensation – To replace critical areas at or adjacent to the site on which a critical areas has been impacted.

Ordinary High Water Mark – That mark which is found by examining the bed and banks of water bodies and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, that the soil has a character distinct from that of the abutting upland in respect to vegetation.

Practical Alternative – An alternative that is available and capable of being carried out after taking into consideration cost, existing technology, and logistics in light of overall project purposes, with less of an impact to critical areas.

Preservation – The removal of a threat to, or preventing the decline of, wetland conditions by an action in or near a wetland. This term includes the purchase of land or easements, repairing water control structures or fences, or structural protection. Preservation does not result in a gain of wetland acres but may result in a gain in functions over the long term.

Project Area – All areas, including those within fifty (50) feet of the area, proposed to be disturbed, altered, or used by the proposed activity or the construction of any proposed structures. When the action binds the land, such as a subdivision, short subdivision, binding site plan, planned unit development, or rezone, the project area shall include the entire parcel, at a minimum.

Prior Converted Croplands – Prior converted croplands (PCCs) are defined in federal law as wetlands that were drained, dredged, filled, leveled, or otherwise manipulated, including the removal of woody vegetation, before December 23, 1985, to enable production of an agricultural commodity, and that: 1) have had an agricultural commodity planted or produced at least once prior to December 23, 1985; 2) do not have standing water for more than 14 consecutive days during the growing season, and 3) have not since been abandoned.

Qualified Professional – A person with experience and training in the pertinent scientific discipline, and who is a qualified scientific expert with expertise appropriate for the relevant critical area subject in accordance with WAC 365-195-905. A qualified professional must have obtained a B.S. or B.A. or equivalent degree in biology, engineering, environmental studies, fisheries, geomorphology, or related field, and have at least five years of related work experience.

- (a) A qualified professional for wetlands must be a professional wetland scientist with at least two years of full-time work experience as a wetlands professional, including delineating wetlands using the state or federal manuals, preparing wetlands reports, conducting function assessments, and developing and implementing mitigation plans.
- (b) A qualified professional for habitat must have a degree in biology or a related degree and professional experience related to the subject species.
- (c) A qualified professional for a geological hazard must be a professional engineer or geologist, licensed in the state of Washington.
- (d) A qualified professional for critical aquifer recharge areas means a hydrogeologist, geologist, engineer, or other scientist with experience in preparing hydrogeologic assessments.

Re-establishment – The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural or historic functions to a former wetland. Re-establishment results in rebuilding a former wetland and results in a gain in wetland acres and functions. Activities could include removing fill, plugging ditches, or breaking drain tiles.

Rehabilitation – The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural or historic functions and processes of a degraded wetland. Rehabilitation results in a gain in wetland function but does not result in a gain in wetland acres. Activities could involve breaching a dike to reconnect wetlands to a floodplain or returning tidal influence to a wetland.

Repair or Maintenance – An activity that restores the character, scope, size, and design of a serviceable area, structure, or land use to its previously authorized and undamaged condition. Activities that change the character, size, or scope of a project beyond the

original design and drain, dredge, fill, flood, or otherwise alter critical areas are not included in this definition.

Restoration – Measures taken to restore an altered or damaged natural feature, including:

- (a) Active steps taken to restore damaged wetlands, streams, protected habitat, or their buffers to the functioning condition that existed prior to an unauthorized alteration; and
- (b) Actions performed to re-establish structural and functional characteristics of the critical area that have been lost by alteration, past management activities, or catastrophic events.

SEPA – Washington State Environmental Policy Act, Subchapter 43.21C RCW.

Soil Survey – The most recent soil survey for the local area or county by the National Resources Conservation Service, U.S. Department of Agriculture.

Species – Any group of animals or plants classified as a species or subspecies as commonly accepted by the scientific community.

Species, Endangered – Any wildlife species native to the state of Washington that is seriously threatened with extinction throughout all or a significant portion of its range within the state (WAC 232-12-297, Section 2.4).

Species of Local Importance – Those species of local concern designated by the City in Chapter XX.XX due to their population status or their sensitivity to habitat manipulation.

Species, Priority – Any fish or wildlife species requiring protective measures and/or management guidelines to ensure its persistence at genetically viable population levels as classified by the Washington Department of Fish and Wildlife, including endangered, threatened, sensitive, candidate, and monitor species, and those of recreational, commercial, or tribal importance.

Species, Threatened – Any wildlife species native to the state of Washington that is likely to become an endangered species within the foreseeable future throughout a significant portion of its range within the state without cooperative management or removal of threats (WAC 232-12-297, Section 2.5).

Species, Sensitive – Any wildlife species native to the state of Washington that is vulnerable or declining and is likely to become endangered or threatened throughout a significant portion of its range within the state without cooperative management or removal of threats (WAC 232-12-297, Section 2.6).

Stream – An area where open surface water produces a defined channel or bed, not including irrigation ditches, canals, storm or surface water runoff devices, or other entirely artificial watercourses, unless they are used by salmonids or are used to convey a watercourse naturally occurring prior to construction. A channel or bed need not contain

water year-round, provided there is evidence of at least intermittent flow during years of normal rainfall.

Unavoidable Impacts – Adverse impacts that remain after all appropriate and practicable avoidance and minimization has been achieved.

Washington Administration Code (WAC) – Administrative guidelines implementing the Growth Management Act, WAC 365-190 and WAC 365-195, as amended.

Wetlands – Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands do not include those artificial wetlands intentionally created from non-wetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from non-wetland areas to mitigate the conversion of wetlands.

Wetland Mitigation Bank – A site where wetlands are restored, created, enhanced, or in exceptional circumstances, preserved expressly for the purpose of providing advance mitigation to compensate for future, permitted impacts to similar resources.

Wetland Mosaic – An area with a concentration of multiple small wetlands, in which each patch of wetland is less than one acre; on average, patches are less than 100 feet from each other; and areas delineated as vegetated wetland are more than 50% of the total area of the entire mosaic, including uplands and open water.