WASHINGTON STATE RECREATION AND CONSERVATION OFFICE
Washington Invasive Species Council

Meeting Agenda
Washington Invasive Species Council

June 16, 2016

WET Science Center, Board Meeting Room, 500 Adams Street NW, Olympia, WA 98501

Time: Opening session will begin as shown; all other times are approximate.

Public Comment:
If you wish to comment at a meeting, please fill out a comment card and provide it to staff. Please be sure to note on the card if you are speaking about a particular agenda topic. The chair will call you to the front at the appropriate time.

You also may submit written comments to the Council by mailing them to the RCO, Attn: Justin Bush PO Box 40917, Olympia, WA 98504 or by emailing justin.bush@rco.wa.gov.

Special Accommodations:
If you need special accommodations to participate in this meeting, please notify us at 360/725-3943.

OPENING AND WELCOME

9:00 a.m.	**Welcome and Call to Order** • Facilities and Safety Information • Review Agenda	*Chair*

HOT TOPIC REPORTS

9:10 a.m.	**1. Executive Coordinator's Introduction & Report**	*Justin Bush*
9:30 a.m.	**2. Legislative Updates**	*All*
9:50 a.m.	**3. University of Washington Green Crab Research**	*Emily Grason*
10:10 a.m.	**4. Columbia Gorge Invasive Species Project**	*Emily Stevenson*
10:30 a.m.	**BREAK**	

DISCUSSIONS, DECISIONS, AND UPDATES

10:40 a.m.	**5. AIS Funding Advisory Committee Update**	*Bill Tweit*
10:50 a.m.	**6. Clallam County Integrated Roadside Weed Management Plan**	*Cathy Lucero*
11:10 a.m.	**7. Regional Don't Let it Loose Campaign**	*Justin Bush*
11:20 a.m.	**8. Economic Analysis of the Impact of Invasive Species in Washington**	*Alison Halpern*
11:30 a.m.	**9. Aquatic Invasive Species General Management Permit Renewal**	*Nathan Lubliner*
11:40 a.m.	**10. Top 50 Species Prioritization Process**	*Justin Bush*

12:00 p.m.	**BREAK**	
12:20 p.m.	**11. Council Business** A. Strategic Plan Accomplishment Update B. New Council Members C. Industry Panel Discussion D. Alternate Member Discussion E. Select September Meeting Location F. Approval of March Minutes	*Justin Bush*
1:30 p.m.	**12. PUBLIC COMMMENT**	
1:45 p.m.	**ADJOURN**	

Aquatic Invasive Species Funding Advisory Committee

Report & Recommendations

April 13, 2016

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April 13, 2016

Washington Invasive Species Council
In care of Raquel Crosier
Recreation and Conservation Office
P.O. Box 40917
Olympia, Washington 98504-0917

VIA EMAIL ONLY

Dear Chairman Tweit and Council Members:

Attached please find the final report of the Aquatic Invasive Species Funding Advisory Committee. The Committee deliberated for about five months and provides a complete report including consensus recommendations on an overall approach to AIS program funding, use of the general fund, user fees, and public/private partnerships. The Committee did not reach consensus on shipping vessels participation in AIS program funding and a range of perspectives on that issue is discussed in the report.

On behalf of the Committee, thank you for the opportunity to deliberate and offer recommendations on this very important topic. Committee members are available to answer questions or provide additional information at your discretion.

Respectfully,

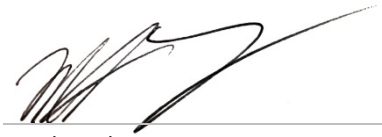
Elizabeth McManus

Elizabeth McManus
Committee Facilitator

Aquatic Invasive Species Funding Advisory Committee

My signature acknowledges my participation in the AIS FACt process and my agreement that the consensus recommendations and text on non-consensus items accurately reflects the work of the Committee. With respect to recommendations, consensus was defined by the AIS FACt as a recommendation that all participants can "live with," even though it might not be their first—or even preferred—choice.

David Fyfe
NW Indian Fisheries Commission



Mark Taylor
Trout Unlimited

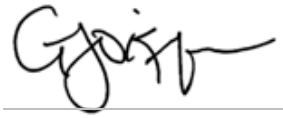
Diane Cooper
Pacific Coast Shellfish Growers Association

Tom Davis
WA State Farm Bureau

Jerry Joyce
Seattle Audubon Society

Shaun Seaman
Chelan PUD

Thomas O'Keefe
American Whitewater



Gerry O'Keefe
Washington Public Ports Association

Doug Levy
Recreational Boating Association of Washington

Mike Schwisow
Washington Water Resources Association

Brian Heinrich
City of Bellingham

Mike Moore
Pacific Merchant Shipping Association

Peter Schrappen
Washington Marine Trade Association

Joe Maroney
Kalispel Tribe of Indians/Upper Columbia United Tribes

Charlie Costanzo
Vessel Alliance

Acknowledgements

The Committee acknowledges and thanks project staff for their support of this work. Raquel Crosier (RCO/WISC), Allen Pleus (WDFW), and Bill Tweit (WDFW). Facilitation and report writing services were provided by Elizabeth McManus (Ross Strategic).

Aquatic Invasive Species Funding Advisory Committee

Report & Recommendations

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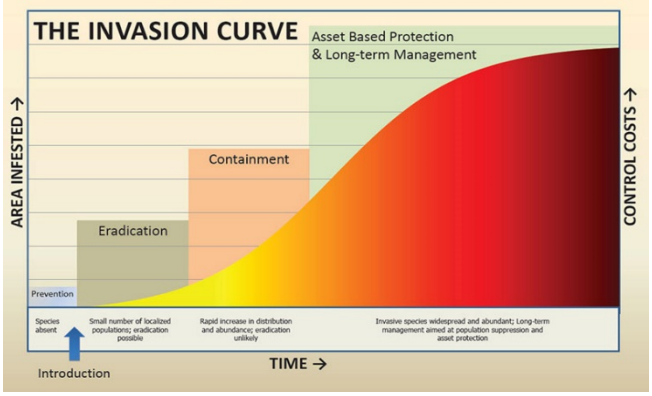
Background

Aquatic invasive species (AIS) are a serious threat to Washington State's economy, native species and landscape. In the United States, approximately $138 billion dollars is spent annually on non-native invasive species, of which $7.3 billion is spent on invasive aquatic weeds, mussels, clams, and fish. Quagga and zebra mussels are the most expensive and devastating AIS to invade the United States, costing an estimated $5 billion annually in prevention and control efforts. The Northwest is the last region in the United States that remains mussel-free. The projected cost of controlling a Zebra/Quagga mussel infestation in the Pacific Northwest if they were to become established here, for example, is $500 million annually. The Pacific Northwest Economic Region has produced a number of reports on the current and potential future economic harm from invasive species in the northwest, for example: Economic Impacts of Invasive Species in the Pacific Northwest Economic Region (PENWER, January 2012) and Advancing A Regional Defense Against Dreissenids in the Pacific Northwest (PENWER, August 2015).



AIS Cost Curve

While we know that prevention is prudent and much cheaper than control, Washington's AIS program prevention, enforcement, and ballast water efforts remain significantly underfunded; with only $760,000 in stable program funding available in fiscal year 2014, the lowest it has been since 2007. Compared to the twelve other states with AIS programs, Washington's current program ranks near the bottom, only Alaska's program is smaller. Lack of a healthy state prevention program in Washington has caused at least one local jurisdiction to initiate their own AIS program and fees – raising the potential for a patchwork of programs and boating fees within the State. These patchwork approaches can quickly proliferate, California has approximately 80 separate local AIS management fees. Washington currently has only one local AIS management program with a fee: the Lake Whatcom Management Program (administered by the City of Bellingham, Whatcom County, Lake Whatcom Water and Sewer District) charges up to $50/year to use Lake Whatcom and Lake Samish. A comparison of the state AIS program funding levels is in Attachment 1.

The 2015 Legislature directed that part of the aquatic lands enhancement (ALEA) account be used to develop recommendations for future funding for the State AIS program. Recommendations must be provided to the Governor and Legislature by June 1, 2016. To fulfill this direction, WDFW, in partnership with the Washington Invasive Species Council (WISC) convened the AIS Funding Advisory Committee ("Committee") to consider potential funding mechanisms and make recommendations.

The Washington Invasive Species Council and WDFW identified potential Committee members by reaching out to individuals in the aquatic invasive species community including commercial and recreational boaters, ports, environmental interests, and other stakeholders, as well as local and tribal governments. Potential members were invited by the Invasive Species Council and WDFW. The

committee met five times between September 2015 and February 2016. The agreed upon Committee charter is in Attachment 2.

The Committee agreed that only recommendations on which they reached consensus would be forwarded to the Legislature. Consensus was defined as a recommendation that all participants can "live with," even though it might not be their first—or even preferred—choice. In the event consensus was not reached on key issues, the Committee agreed that the range of perspectives expressed by participants would be described in their report.

The Committee used program funding need estimates prepared by WDFW. WDFW estimates a total funding need of approximately $5.2 million/year to fund the full range of activities under the AIS program; prevention ($1.85M), enforcement ($1.25M), ballast water management ($1.1M), and a new local management grant ($1M). The Committee was not asked to evaluate the content of WDFW's AIS program; it therefore did not engage in a detailed discussion of, nor reach any conclusions on, program scope and content, or the size of the program funding need and, absent discussion on program scope, takes no position on the state estimate because, in accordance with their Charter, they did not review it. The Committee felt strongly that in implementing AIS prevention, enforcement, ballast water, and local management grant activities every effort should be made to ensure efficiency and leverage state resources for greatest benefit. Additional information on WDFW's estimates of program funding need are in Attachment 3.

Principles

The Committee started its work by developing a number of principles to guide our deliberations over potential funding options. No single principle represented an absolute "go or no go" decision for any individual funding mechanism. Rather funding mechanisms that better conformed to the principles overall were more likely to move forward in Committee deliberations than those which did not. See, below, the committee's eight guiding principles.

- **Specific**. Specific in terms of amount, timing (e.g., duration), activities to fund, and performance measures. Performance based. Scalable around need and effectiveness.
- **Transparent**. Providing a clear nexus (or "line of sight") between the funding source and the risk/activity/funding need. Distributed so one entity doesn't bear a disproportionate burden.
- **Efficient**. Not duplicating Federal work, leveraging existing programs and work as much as possible. Favorable benefit-cost profile.
- **Stable, reliable**. Not swinging dramatically in amount over time.
- **Sufficient**. Adequate to fund the program need; not single species focused.
- **Equitable**. Costs are shared between potential "vectors" or risks, program beneficiaries, and the public. Recognizes current program funding sources/contributors.
- **Minimizes adverse consequences**. Doesn't shift economic activity (e.g., to other ports); doesn't deter access to recreation.
- **Implementable**. Easy to administer and easy to comply with. Uniform across jurisdictions.

Recommendations

The Committee began with an extensive list of program funding options and approaches prepared by WDFW. They added to and refined this list, and eliminated from further consideration the majority of the options. The committee then began to focus on the remaining options and developed their consensus recommendations.

The Committee makes four consensus recommendations. As described earlier in this report, consensus is defined as a recommendation that all participants can "live with," even though it might not be their first—or even preferred—choice. The committee also deliberated, but did not reach consensus on shipping vessels' participation in AIS funding, which is described in Section 4.

1. Shared Investment. State funding for AIS programs should be made up of a combination of state general funds; fee-based "user" funding; and private/public partnerships. Users in this case are comprised of sectors that may form pathways which pose a higher risk of introduction or spread of AIS. Public/private partnerships in this Report are focused on entities that are particular beneficiaries of AIS program activities and an AIS-free aquatic environment. Federal funding for AIS programs also is critical and every effort should be made to expand and leverage Federal funding to supplement state efforts.

2. General Fund. In recognition of the benefits to all Washington residents that accrue from having an environment relatively free from aquatic invasive species, the costs that would be incurred in the event of a zebra/quagga mussel infestation, and the wide variety of vectors that could contribute to the spread of aquatic invasive species, funding for AIS programs should have a strong General Fund component. The Committee agreed that the general fund should account for at least half of total AIS funding ($2.6M/ year using WDFW's current estimate of program funding need). Beyond that agreement, Committee members were mixed on the exact proportion of AIS funding that should be made up of General Fund. Some Committee members supported a substantial General Fund goal, up to 100 percent of the program. Other Committee members were not comfortable relying on General Fund funding to the exclusion of funding from user groups, particularly given previous attempts for funding for AIS programs from the General Fund. The Committee specifically discussed and endorsed using revenue from the current electric Public Utility Tax as part of General Fund funding for AIS programs, because of the benefits of an AIS-free environment to electric utility generators and the impact on electric utility rates that would occur if AIS were to foul utility infrastructure.

3. Fee-based, User Funding. Fee-based, user funding should draw on sectors that present a risk of AIS introduction or transmission, and those sectors that benefit most from healthy, AIS-free aquatic environments: recreational boaters, small boaters and the paddle sport community, commercial watercraft, large shipping vessels, out-of-state boaters who use Washington waters, commercial transporters of watercraft, seaplane owners, and the pet/aquarium trade. The AIS FACt agreed that broad participation in fee-based, user funding would enhance the success of the program. Recreational boaters are the only group that currently participates in funding for the state AIS program through fees, contributing over $5 million to date, plus additional effort and resources through public/private partnerships, and they expect to continue (see below). As other individual sectors seek ways to avoid fees on their particular sector while supporting fees on other user groups, overall support for fee-based

funding declines. Some members feel that unless all major identified user groups contribute to this program no additional user fees should be implemented. In all instances any interaction with user groups through fees should be used as an opportunity for education and outreach on the risks and potential transmittal methods of AIS and actions users can take to minimize AIS transmission risk. In structuring new user fee programs care should be taken to ensure that program implementation adheres to the principle of efficiency with a favorable benefit-cost profile, so that the administrative burden of collecting the funding doesn't exceed the revenue realized.

3a. Recreational registered watercraft. Recreational registered watercraft already participate in AIS funding and expect to continue to do so. Recreational registered watercraft are watercraft over 16ft in length or smaller watercraft with motors of at least 10hp. Owners of these watercraft are required to register their watercraft annually in Washington State through the Department of Licensing. The cost of registration includes a $2 per watercraft/per year AIS prevention and enforcement fee, which generates approximately $.5M in AIS funding per year. Recreational boaters are the only organization paying funds directly into the AIS operating budget program through an ongoing $2 portion of annual registration fees. In addition to paying approximately $500,000 a year into the AIS funding, recreational boaters took a significant step in agreeing to both extend this annual payment and to make it permanent through elimination of a sunset date. There was broad recognition that recreational boaters already are paying a significant share into the current AIS program. This fee should continue to fund AIS programs.

3b. Small watercraft. Small watercraft include all non-registered boats that are less than 16ft, watercraft with motors less than 10hp or with no motors including the paddle sport community. Small watercraft have the potential to introduce and spread invasive species which might attach to the hull, be entrained in trapped water in the vessel, or transported by small watercraft users wading and launching boats in the shallows; more importantly, small watercraft users benefit from an AIS-free environment through, among other things, access to a wide variety of salt and freshwater bodies that would likely be closed if AIS infestation were to occur (e.g., as in the closure of Capitol Lake in Olympia due to New Zealand mud snail infestation). Any fees for small watercraft should be commensurate with AIS funding participation (fees) from registered boaters and should not exceed the small watercraft fees in place in Oregon and Idaho, which are $5.00 and $7.00 per year respectively. Participation of the small watercraft community in AIS funding could be accomplished through a variety of mechanisms, such as: (a) registering small watercraft so they participate in the $2 per vessel/per year fee just as recreational boaters do; (b) establishing a permit or sticker system for small watercraft similar to those established in Oregon, Idaho, and several other states; (c) establishing a surcharge/fee on small watercraft equipment purchases such as the boats and paddles, waterproof boots/waders, wetsuits, and the like; or (d) a combination of these mechanisms. Currently these watercraft are not registered in Washington State, and there appears to be little, if any, support from the paddle sports community for registration at this time; the infrastructure associated with establishing a fee collection system also is not insignificant. The paddle sport community is a large part of the small watercraft user group. They are currently engaged in an effort being led by State Parks to explore various mechanisms to participate in funding for state programs that are of interest to

them. Development of the details around the paddle sport community's participation in AIS funding should be coordinated with the State Parks-led effort to ensure that any new program to collect fees from this sector meets a comprehensive set of their needs and interests and is not limited to only AIS funding. Provisions should be made to ensure fairness for individuals or groups (such as boat clubs or commercial enterprises or businesses) that have multiple small watercraft.

3c. Commercial watercraft and seaplanes. Commercial watercraft and commercial and recreational seaplanes that are exempt from the current $2 per vessel/per year recreational watercraft registration fee have the potential to introduce or spread AIS in the same ways as other watercraft and vessels. The number of commercial watercraft and seaplanes is small, therefore, developing a separate participation mechanism only for them likely would be disproportionately costly. Their participation should instead be accomplished by leveraging an existing program – such as existing annual excise and property tax requirements – or by combining them with another user group such as small watercraft. Some commercial watercraft meet the definition of "small watercraft" and care should be taken not to impose duplicative fees on them.

3d. Out-of-state watercraft. Watercraft registered in another state that use Washington waters have the potential to introduce or spread AIS. Participation of out-of-state watercraft in AIS funding should be accomplished through a permit/sticker program. Fees for out-of-state watercraft should be comparable to the $20 and $22 fees already in place in Oregon and Idaho respectively. Establishment of this fee program should include authority for WDFW to enter into reciprocity agreements with neighboring states where such agreements are determined to be in the best interest of Washington State residents.

3e. Commercial transporters of watercraft. Commercial transporters of watercraft have the potential to introduce or spread AIS, and benefit from an AIS-free environment. The number of commercial watercraft transportation events is very small; therefore, developing a separate participation mechanism only for them would be disproportionately costly. Their participation in AIS funding should be accomplished by combining an AIS program fee with an existing program that reaches them (e.g., through the state patrol) or by combining their participation with that of another user group such as the non-resident watercraft.

3f. Pet and Aquarium Trade. Release of exotic aquatic animals has created AIS outbreaks in Washington. Participation of sellers of aquatic pets, such as fish and amphibians, and related supplies in AIS funding could be modeled after the Tire Retailer Fee by establishing a reasonable fee on the sale of aquatic pets and aquariums to be collected at the point of sale and forwarded to a dedicated AIS program account. Outreach to representatives of the pet and aquarium industry should help inform establishment of the best fee mechanism and amounts.

4. Private/Public Partnerships. Wherever practical and of mutual interest and benefit, partnerships should be used to implement AIS program activities and supplement state general funds and user fees. Ideally, partnerships would have sufficient durability and predictability to implement the contemplated

partnership activities reliably. The groups mentioned in the recommendations below (irrigation districts, shellfish growers, and non-Federal hydropower, at the sector level, acknowledge and intend to move forward with WDFW to develop clear and mutually beneficial partnerships.

4a. Irrigation districts. Irrigation districts are key beneficiaries of an AIS-free environment and have expressed some interest in a partnership approach if a state program is not sufficient. WDFW and RCO should enter into a process with irrigation districts with the goal of developing a partnership where districts take responsibility for AIS monitoring in their jurisdictions if the state program is not funded at a level adequate to protect irrigation facilities. This process will involve creating a shared understanding of the risks of AIS in irrigation infrastructure, and agreement on monitoring and analysis methods and protocols. Districts also might participate in AIS funding through other means, such contributing funding to support a local AIS prevention grant program.

4b. Education, Outreach, and Local AIS Grants. In addition to the broad public benefit provided by AIS programs, a number of entities particularly benefit from an AIS-free environment, including the shellfish industry and the non-federal hydropower system[1], and could improve AIS outcomes through public/private partnerships for education and outreach, local AIS grants, or other beneficial activities that reduce the likelihood of AIS introduction or spread in Washington. WDFW and RCO should enter into a process with these entities with the goal of developing, by December 31, 2016, a partnership program to encourage and enable entities to meaningfully contribute to AIS prevention education and outreach and/or contributing to a local AIS prevention grant program.

Additional Committee Observations and Discussion – Shipping Vessels

Ultimately, the Committee did not reach consensus on shipping vessels participation in AIS program funding. Shipping vessels are vessels of three hundred gross tons or more, United States and foreign, carrying, or capable of carrying, ballast water into the coastal waters of the state after operating outside of the coastal waters of the state. Like other watercraft, shipping vessels have the potential to introduce or spread AIS; in this case though ballast water and biofouling (where AIS attach to the hulls of vessels). Six states have AIS-related fees for shipping vessels. In the West, fees are based on qualified vessel arrivals and are $88 in Oregon and $850 in California. In the Great Lakes shipping vessels participate in state AIS funding through permits and annual fees which range from a $75 application fee and $150 annual permit fee in Michigan to a $1,200 application fee and $385 annual permit fee in Wisconsin.

Shipping vessels are subject to both state and federal US Coast Guard and Environmental Protection Agency ballast water and biofouling requirements. Committee members representing shipping vessels and ports believe that the federal regulatory transition to a new technology-based ballast water

[1] The Federal Hydropower System also is a particularly beneficiary of an AIS-free environment. Federal hydropower operators make investments in AIS detection and prevention to the Bonneville Power Administration; these investments are critical and should continue Non-federal hydropower operators make investments in AIS detection and prevention as required by their operating licenses issued by the Federal Energy Regulatory Commission. Both of these federal and non-federal hydropower system investments are critical and should continue.

management system will greatly reduce or eliminate the need for a state program. In the Committee charter, members agreed to assume that the state ballast water program would be needed for at least five years to assess whether the technology and the transition to federal ballast water management adequately protects state aquatic environmental and aquatic-based economic resources.

Most Committee members believed that shipping vessels should participate in AIS funding along with other watercraft. Committee members representing shipping vessels and ports did not agree that they should participate in AIS funding citing the following. (1) Many shipping vessels do not discharge ballast water in Washington waters and therefore present minimal risk of AIS introduction or transfer. (2) Federal ballast water requirements represent a significant financial burden on shipping vessels and, as they are more fully implemented, will address ballast water concerns minimizing the need for a state ballast water program. Shipping vessels and ports believe a state ballast water program largely duplicates federal efforts and therefore are not in support of increased funding for the state program; they further believe that if state fees for shipping vessels are put in place even temporarily to bridge between the current program status and full implementation of federal ballast water requirements, there is little hope such fees will be adjusted downward or sunset as Federal ballast water programs come to fruition. (3) Fees imposed by Washington State on shipping vessels could damage the competitiveness of Washington ports.

Committee members who believed shipping vessels should participate in AIS funding noted the following. (1) In the context of a broadly shared resource – marine and freshwater ecosystems -- it seems unfair to single out shipping vessels as the only user groups whose participation in AIS funding is not contemplated, especially given the size of the vessels compared, for example to a recreational boat or a small watercraft. (2) A user group's risk of AIS introduction or transfer is not the only factor that should govern whether or how they participate in AIS funding, all users of the marine and freshwater environments benefit in different ways from keeping these environments free of AIS; risk has not been a determining factor in the participation of other user groups, for example, many recreational boats stay in only one area of Washington waters and therefore present minimal risk of AIS introduction or transfer however they participate in AIS funding because as users of the aquatic environment they benefit from keeping these waters open and AIS free and want to ensure the AIS issue is well addressed. (3) Federal ballast water programs are not yet fully implemented, their ability to protect state resources is unclear, and in their current form they do not adequately address biofouling, considered by scientists to be an as great or greater AIS risk as ballast water, and where all shipping vessels present an AIS risk.

Attachment 1: Comparison of State AIS Program Funding Levels

Summary of 2014 AIS Budgets

FINAL Feb. 23, 2016

Table 1. States with aquatic invasive species (AIS) watercraft fees by AIS program type, annual fee amount and annual number of participating watercraft (units), and by watercraft type (motorized and non-motorized) and resident or non-resident categories. Arranged by state in alphabetical order.

State/Local (Year started)	AIS Program Type (Sticker or Permit)	Motorized				Non-Motorized			
		Resident		Non-Resident		Resident		Non-Resident	
		Fee	*Units*	*Fee*	*Units*	*Fee*	*Units*	*Fee*	*Units*
California (2014)	AIS Sticker	$8	176K	N/A	-	N/A	-	N/A	-
Idaho (2009)	Reg & AIS Sticker	$10	87K	$22	13.5K	$7	24K	$7	(Incl. in resident)
Maine (2002)	AIS Sticker	$10	93K	$20	10K	N/A	-	N/A	-
Minnesota (1992)	Reg Sticker	$1.67	273K	N/A	-	(Incl. in resident motorized)		N/A	-
Nevada (2013)	Reg & AIS Sticker	$10	40K	$20	2K	$5	4.2K	$10	0.6K
Oregon (2010)	Reg & AIS Permit	$2.50	69.3K	$20	4.7K	$5	29K	$5	10K
Washington (2006)	Reg Sticker	$2	245K	N/A	(Est. 20K comb R/NR)	N/A	(Est. 50K)	N/A	(Est. 20K comb R/NR)
Wyoming (2010)	Reg & AIS Sticker	$10	20K	$30	10K	$5	6.9K	$15	5.3K
Lake Whatcom (WA) (2013)	AIS Sticker	$50	2K	$50	.37K	$10	2.4K	$10	(comb R/NR)
Lake Tahoe (CA/NV) (2010)	AIS Sticker/ Seal	$30-121	(new)	$30-121	(comb R/NR)	N/A	-	N/A	-
Truckee Reg. (CA)(2014)	AIS Permit	$20-40	(unk)	$20-40	(comb R/NR)	N/A	-	N/A	-

Table 1 Notes:

- AIS Program Type -
  - "Reg Sticker" means payment of AIS fee for resident registered watercraft is verified by having valid state watercraft registration sticker/decal
  - "AIS Sticker" means the state issues a separate AIS sticker/decal that must be readily visible on the watercraft in addition to any valid state registration sticker/decal

- "AIS Permit" means the state issues a document that does not have to be displayed on the exterior of the watercraft, but does have to be in possession by someone on the watercraft
- Fees are all per year (split if fee covers multiple years)
- Fees/Units are number of boaters/watercraft that participated in program based on 2014 data unless otherwise noted
- The terms "motorized" and "non-motorized" are standardized and reflect a state's minimum length and/or motor power criteria for registration purposes (e.g. in WA, a sailboat over 16 ft without a motor is classified as "motorized" – requires annual registration - and a skiff less than 16ft with a motor less than 10 hp would be classified as "non-motorized" – registration not required)
- States vary on watercraft definitions for each category and generally have multiple sub-funding options.
- Canadian provinces do not have watercraft fees as registration is federal and free.

Table 2. U.S. State/Canadian Province 2014 Aquatic Invasive Species Program Annual Budgets – arranged highest to lowest by 2014 budget.

State/ Province/ Local (Year started)	2014 AIS Budget ($millions)	2014 Boat Regist. (Total)	2014 Pop. (Humans)	Funding sources
Minnesota (1991)	$ 8.85	809K	5.5M	State general fund (41%); Watercraft fees (22%); Trust fund (10%); NR fishing lic fee (9%); Federal (8%)
California (2000)	$ 5.92	729K	39.1M	Watercraft registration diversion (48%); AIS Watercraft fees (48%); General fund (4%); Federal (<1%)
Wisconsin (2003)	$ 4.50	627K	5.8M	Gas tax diversion (100%)
Colorado (2008)	$ 4.00	88K	5.5M	State Severance tax diversion (100%)
Michigan (1996)	$ 3.50	789K	9.9M	State (76%); Federal (24%)
Alberta (2013)	$ 2.10	166K	4.1M	Province (93%); Stakeholder contributions (7%)
Utah (2007)	$ 1.90	67K	3.0M	State (71%); Federal (18%); Other grants (11%)
Wyoming (2010)	$ 1.35	27K	0.6M	State (63%); Watercraft fees (33%); Federal (4%)
Idaho (2001)	$ 1.25	86K	1.7M	Watercraft fees (100%)
Lake Tahoe (2008)	$ 1.20	N/A	N/A	Federal (47%); AIS Watercraft fees (46%); State-Nevada (7%)
Montana (2004)	$ 1.14	47K	1.0M	State (84%); General license diversion – fish/ hunt, ATV, etc. (16%); Federal (2%); other grants (3%)
Brit. Columbia (2008)	$ 1.10	unk	4.6M	BC Power/Columbia Basin Trust grants (45%); Province (37%); Provincial partners/In-kind (18%)
Oregon (2010)	$ 0.81	163K	4.0M	Watercraft fees (100%)
Hawaii (2005)	$ 0.78	12K	1.4M	Ship grounding settlement trust fund (100%)

State/ Province/ Local (Year started)	2014 AIS Budget ($millions)	2014 Boat Regist. (Total)	2014 Pop. (Humans)	Funding sources
Nevada (2011)	$ 0.60	44K	2.9M	Federal (65%); Watercraft fees (35%)
Washington (1998)	$ 0.42	230K	7.2M	Watercraft fees (100%)
Lake Whatcom (2013)	$ 0.35	N/A	0.2M (County)	Watercraft fees (35%); City of Bellingham (26%); Whatcom Co. (26%); Lk Whatcom Water/Sewer Dist. (13%)
Alaska (2002)	$ 0.21	70K	0.7M	Federal (81%); State (19%)

Table 2 Notes:

- "AIS Budget" primarily for aquatic invasive animal species – not including shipping (ballast water/biofouling) pathways
- State 2014 watercraft registration data: USCG 2014 Recreational Boating Statistics report
- Population data: https://www.census.gov/popest/data/state/totals/2014/ ; http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/demo02a-eng.htm

Table 3. U.S. State/Canadian Province 2014 Ballast Water/Biofouling Program Annual Budgets - arranged highest to lowest by 2014 budget.

State/Province (Year started)	2014 Budget ($millions)	2014 Arrivals (Vessels)	2014 Discharge Vol (Metric Tons)	Funding sources
California (2000)	$ 4.75	9,263	14.7M	Shipping fee (100%)
Wisconsin (2010)	$ 0.35	944	12.8M	Shipping fee (100%)
Washington (2000)	$ 0.34	4,047	16.8M	State (85%); Watercraft fee (7.3%); Federal (7.3%)
Oregon (2001)	$ 0.22	1,044	6.3M	Shipping fee (50%); State (50%)
Minnesota (2008)	$ 0.13	761	15.8M	Shipping fee (85%); State (15%)
Hawaii (2000)	$ 0.11	1,025	0.6M	State (100%)
Michigan (2002)	$ 0.04	2,912	15.8M	Shipping fee (82%); State (18%)
Alaska (N/A)	$ 0	2,403	12.9M	N/A (USCG/EPA only – mandatory USCG started in 2004; EPA in 2008)
British Columbia (N/A)	$ 0	3,430	(pending later 2016)	N/A (Federal only – mandatory started in 2006)

Table 3 Notes:

- Arrivals/Discharge: data from USCG National Ballast Information Clearinghouse (NBIC)
    - http://invasions.si.edu/nbic/search.html
    - NBIC data used for comparison purposes – WA 2014 arrival/discharge data similar, but recorded 4003/17.2 m^3 respectively

Table 4. Comparison of 2014 AIS Program budgets by select state and prevention, enforcement, and ballast water/ biofouling program activities – arranged highest to lowest by total 2014 budget.

State	AIS Prevention ($millions)	AIS Enforcement ($millions)	AIS Grant Program ($millions)	Ballast Water/ Biofouling ($millions)	Total 2014 Budget ($millions)
California	$ 3.19	$ 0.04	$ 2.69	$ 4.75	$10.67
Minnesota	$ 5.95	$ 2.24	$ 0.66	$ 0.13	$ 8.98
Wisconsin	$ 0.50	-	$ 4.00	$ 0.35	$ 4.85
Colorado	$ 3.40	$ 0.30	$ 0.30	-	$ 4.00
Michigan	$1.30	$ 0.17	$ 2.00	$ 0.04	$ 3.51
Alberta	$ 1.40	$ 0.63	-	-	$ 2.10
Utah	$ 1.50	$ 0.40	-	-	$ 1.90
Wyoming	$ 1.35	-	-	-	$ 1.35
Oregon	$ 0.57	$ 0.11	$ 0.14	$ 0.22	$ 1.30
Idaho	$ 0.50	-	$ 0.75	-	$ 1.25
Montana	$ 1.05	$ 0.09	-	-	$ 1.14
British Columbia	$ 1.10	-	-	-	$ 1.10
Hawaii	$ 0.78	-	-	$ 0.11	$ 0.89
Washington	$ 0.25	$ 0.17	-	$ 0.34	$ 0.76
Alaska	$ 0.21	-	-	-	$ 0.21

Table 4 Notes:

- AIS Enforcement budgets are funds targeted specifically to "badge and gun" officers to support compliance with AIS regulations
- AIS Grant programs are funds targeted specifically for enhancement of AIS
- "-" means no AIS-specific budget for that category

All Tables State/Province Data Sources & Notes

Alaska: Tammy Davis (AK Dept of Fish and Wildlife)

- http://www.adfg.alaska.gov/index.cfm?adfg=invasive.main
- http://doa.alaska.gov/dmv/research/boat14.htm
- No AIS watercraft fee, enforcement, grant, ballast water, or biofouling programs
- Received additional $500K 1x state funds in 2014 for invasive tunicate work
- State funds decreasing annually as price for oil drops; 2015 reduced from $39K to $8.8K
- 0% of AIS prevention and grant budgets goes to AIS plant management other than transported on watercraft.

Alberta (Canada): Kate Wilson (Alberta Environment & Parks) – amounts in Canadian dollars

- http://esrd.alberta.ca/recreation-public-use/invasive-species/aquatic-invasive-species/default.aspx
- ~3% of AIS prevention and enforcement budgets goes to AIS plant management other than transported on watercraft.

British Columbia (Canada): Matthias Herborg (BC Ministry of Environment) – amounts in Canadian dollars

- https://www.for.gov.bc.ca/hra/invasive-species/index.htm
- 0% of AIS prevention and grant budgets goes to AIS plant management other than transported on watercraft. Separate program/budget.
- Ballast water data provided by Paul Mudroch at Transport Canada

California:

- Martha Volkoff, State AIS Coordinator (CA Dept. of Fish & Wildlife)
    - https://www.wildlife.ca.gov/Conservation/Invasives/Quagga-Mussels
    - Resident motorized watercraft registration is every 2 years ($16 AIS fee/2)
    - CDFW ($3.23M) watercraft funds diverted from existing registration costs
    - There are 80 known local watercraft inspection programs throughout California - See https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=46843 for list. Lake Tahoe and Truckee Regional programs are two of an unknown number that charge watercraft fees
    - ~5% of AIS prevention budget goes to AIS plant management other than transported on watercraft.
- Eddie Hard, AIS Environmental Program manager (CA State Parks)
    - http://www.dbw.parks.ca.gov/Funding/QZGrant.aspx
    - CA State Parks ($2.69M) watercraft funds are from new AIS sticker fee and units apply only to resident registered watercraft used in freshwater systems (zebra/quagga mussel risks) - Watercraft used exclusively in marine environments exempt
    - AIS grant program competitive and targeted for prevention of zebra/quagga species to the owners/operators of uninfested waters that are open to the public
    - $200K of AIS grant went to support Lake Tahoe AIS program
- Nicole Dobroski, Ballast Water/Biofouling Program Lead (CA State Lands Commission)
    - http://www.slc.ca.gov/Programs/MISP.html
    - $850 per qualified vessel arrival – QVA
    - Funds divided between programs as follows: Ballast water (85%), Biofouling (15%), Marine species monitoring (39%), Water quality (2%)

Colorado: Elizabeth Brown, AIS Coordinator (CO Dept. of Parks & Wildlife)

- http://cpw.state.co.us/thingstodo/Pages/BoatInspection.aspx
- <5% of AIS prevention budget goes to AIS plant management other than transported on watercraft.
- AIS grant program is contracted (non-competitive) to local jurisdictions to operate state watercraft inspection stations at high risk water bodies.

Hawaii – Brian Neilson, AIS Coordinator (HI Dept. of Land and Natural Resources)

- http://dlnr.hawaii.gov/ais/
- 100% of AIS prevention budget is for invasive marine algae management
- Funding sources and AIS prevention more diverse in 2015
- http://dlnr.hawaii.gov/ais/ballastwaterbiofouling/ballastwaterdetails/

- Ballast water (15%), Biofouling (70%), "Non-shipping" (15%)
- 100% of AIS prevention budget is for invasive marine algae management
- Funding sources and AIS prevention more diverse in 2015

Idaho – Tom Woolf, AIS Coordinator (ID Dept. of Agriculture)
- http://www.idahoag.us/Categories/Environment/InvasiveSpeciesCouncil/indexInvSpCouncil.php
- http://www.idahoag.us/Categories/Environment/InvasiveSpeciesCouncil/Sticker_Purchase.php
- Units are based on 2011 data
- 0% of AIS prevention budget goes to AIS plant management other than transported on watercraft - separate budget of approx. $900K/yr.
- Approx. 60% of AIS prevention budget is contracted (non-competitive) to local conservation/lake district "partners" to run state watercraft inspection stations in those areas.

Lake Whatcom (WA) – Teagan Ward (City of Bellingham)
- http://whatcomboatinspections.com/annual-permits-and-fees
- Program (includes Lake Samish) is jointly managed by the Lake Whatcom Management Program, a partnership between the City of Bellingham, Whatcom County, and the Lake Whatcom Water and Sewer District
- The AIS Program is administered by the City of Bellingham's Public Works Department
- No separate fees for resident vs. non-resident boats, est. 365 non-resident based on registration information

Lake Tahoe (CA/NV) – Dennis Zabiglo (Tahoe Regional Planning Agency)
- http://tahoeboatinspections.com/
- $30 "Resident" watercraft fee for those that never leave lake
- $33-121 fee scale for launching boats primarily based on watercraft length

Maine – Bill Swan (ME Dept. of Inland Fish & Wildlife)
- http://www.maine.gov/ifw/atv_snowmobile_watercraft/lake_river_sticker.htm
- Units apply only to watercraft used in freshwater systems (zebra/quagga mussel risks)
- Watercraft used exclusively in marine environments (~27K) exempt

Michigan - Sarah LeSage and Sean Syts (MI Dept. of Environmental Quality)
- http://www.michigan.gov/deq/0,4561,7-135-3313_3677_8278---,00.html
- http://www.michigan.gov/invasives/0,5664,7-324-67998---,00.html
- AIS program funds based on 2015 budgets as more comparative for ongoing values
- Majority of AIS enforcement budget goes to MI DNR for pet/aquarium industry inspections
- Split between AIS animal and plant prevention and grant budgets based on annual or rapid response priority management needs
- AIS grant program is competitive
- Ballast water NPDES permit: $75 appl. + $150 annual permits

Minnesota –
- Kelly Pennington (MN Dept. of Natural Resources)
    - http://www.dnr.state.mn.us/invasives/eco/index.html
    - Resident watercraft registration is every 3 years ($5 AIS surcharge/3); historic – started at $2 in 1990 (AIS plants), then $3 in 1992 (all AIS), then $5 since 1993.

    - Motorized and non-motorized watercraft are combined under their resident watercraft registration laws
    - Unknown percentage of AIS prevention, enforcement, and grant budgets goes to AIS plant management other than transported on watercraft.
    - 6% of AIS prevention budget goes to terrestrial invasive animal species management
    - AIS grant program is competitive
    - An additional $1.1M "Local Funds" is in-kind funding for AIS plant management and watercraft inspections by local groups
- Jeff Stollenwerk (MN Pollution Control Agency)
    - http://www.pca.state.mn.us/index.php/water/water-permits-and-rules/water-permits-and-forms/vessel-discharge-ballast-water-program.html
    - NPDES permit: $1,240 permit appl. + $345 annual fee
    - Ballast water (99%), Biofouling (1%)

Montana - Thomas Boos, AIS Coordinator (MT Fish, Wildlife & Parks)
- http://fwp.mt.gov/fishAndWildlife/species/ais/
- 15% of AIS prevention and grant budgets goes to early detection monitoring for AIS plants

Nevada - Karen Vargas, AIS Coordinator (NV Dept. of Wildlife)
- http://www.ndow.org/Boat/Aquatic_Invasive_Species/
- http://www.ndow.org/Boat/Aquatic_Invasive_Species/Decal_Information/

Oregon –
- Glenn Dolphin (OR Marine Board) and Rick Boatner (OR Dept. of Fish & Wildlife) AIS Co-coordinators
    - http://www.dfw.state.or.us/conservationstrategy/invasive_species/quagga_zebra_mussel.asp
    - http://www.dfw.state.or.us/conservationstrategy/invasive_species.asp
    - http://www.oregon.gov/osmb/clean/pages/aisppfaqspage.aspx
    - Resident motorized watercraft registration is every 2 years ($5 AIS fee/2)
    - Resident/non-resident non-motorized fees estimated 75/25% split
    - 0% of AIS prevention budget goes to AIS plant management other than transported on watercraft – handled by another agency and budget.
    - AIS grants are contracted (non-competitive) to Portland State University to conduct early detection monitoring on behalf of state and other non-competitive research/management grants such as to USFS for tunicate work.
- Rian Hooff, Ballast Water Program Lead (OR Dept. of Environmental Quality)
    - http://www.deq.state.or.us/lq/cu/emergency/ballast.htm
    - $70 per QVA (going to $88 QVA Jan 2016)
    - Ballast water (97%), Biofouling (3%)

Truckee Regional AIS Prevention Program (CA) – web site
- http://truckeeboatinspections.com/
- Annual $40; Seasonal $25 (May-Sept); Monthly $10; Donner only $20 (May-Sept)
- Applies only to "motorized and/or trailered watercraft, and other watercraft having water ballast tanks"

Utah - Nate Owens, Interim AIS Coordinator (UT Dept. of Natural Resources)
- http://wildlife.utah.gov/invasive-mussels.html

Washington – Allen Pleus, AIS and Ballast Water Program Lead (WA Dept. of Fish & Wildlife)

- http://wdfw.wa.gov/ais/
- http://www.dol.wa.gov/vehicleregistration/registerboat.html
- http://wdfw.wa.gov/ais/ballast/
- Ballast water (95%), Biofouling (5%)
- 0% of AIS prevention budget goes to AIS plant management other than transported on watercraft – Dept. of Ecology program.

Wisconsin –

- Robert Wakeman, AIS Coordinator (WI Dept. of Natural Resources)
    - http://dnr.wi.gov/lakes/invasives/AquaticInvasive.aspx
    - ~45% of AIS grant budgets goes to AIS plant management other than transported on watercraft.
    - AIS grant program is competitive.
- Susan Sylvester, Ballast Water Program Lead (WI Dept. of Natural Resources)
    - http://dnr.wi.gov/topic/wastewater/generalpermits.html
    - NPDES permit: $1,200 appl. + $385 annual

Wyoming – Beth Bear, AIS Coordinator (WY Dept. of Fish & Wildlife)

- https://wgfd.wyo.gov/Fishing-and-Boating/Aquatic-Invasive-Species-Prevention/AIS-Resources
- https://wgfd.wyo.gov/Fishin g-and-Boating/Aquatic-Invasive-Species-Prevention/AIS-Decal
- $10 AIS watercraft fee is per year even though resident motorized watercraft registration is every 3 years ($30/registration)
- < 2% of AIS prevention budget goes to monitoring AIS plants other than transported on watercraft.
- AIS enforcement duties part of general enforcement budget.

Attachment 2: AIS FACt Charter

WASHINGTON INVASIVE SPECIES COUNCIL
AQUATIC INVASIVE SPECIES
FUNDING ADVISORY COMMITTEE

CHARTER

I. Background

The 2015 Legislature directed that part of the aquatic lands enhancement account be used to develop recommendations for future funding for the State aquatic invasive species program. Recommendations must be provided to the Governor and Legislature by June 1, 2016.

To fulfill this direction, the Washington Invasive Species Council, in partnership with the Department of Fish and Wildlife (WDFW) and the Recreation and Conservation Office, convened the Aquatic Invasive Species Funding Advisory Committee ("Committee") to consider potential funding mechanisms and make recommendations.

II. Purpose and Anticipated Outcomes

The Committee was established to fulfill the direction of the Legislature by providing recommendations on future funding mechanisms for the State aquatic invasive species program (including the prevention, enforcement, and ballast water programs). Recommendations will be sent to the Invasive Species Council and provided to the Legislature. WDFW, in consultation with the Invasive Species Council and the Governor's office, is responsible for development of a proposal to the Legislature.

It is expected that the Committee will deliberate on the following topics:

- Principles for funding recommendations
- Potential funding mechanisms
- Recommendations for aquatic invasive species program funding mechanisms

For purposes of this effort, the Committee should assume that the State's interest in aquatic invasive species control will continue in perpetuity; and the State ballast water program at its current level will be needed for at a minimum of five more years. The Committee will rely on estimates of program funding need prepared by WDFW.

III. Membership and Participation

The Invasive Species Council and WDFW identified potential Committee members by reaching out to individuals in the aquatic invasive species community including commercial and recreational boaters, ports, environmental interests, and other stakeholders, as well as county and tribal governments. Potential members were invited by the Invasive Species Council and WDFW.

Direct participation of all Committee members is essential to the success of the Committee. For that reason, members are asked to make every effort to attend in-person meetings and participate in conference calls. In the rare occasions that a member cannot be present, an alternate may be proposed to participate on his or her behalf. It is the responsibility of the member to ensure that any alternate is fully briefed and prepared to participate in deliberations.

All members are expected to participate throughout the duration of the process. Only members who participate fully in the process will be included in the Committee consensus.

Members are requested to:

- Represent their community/sponsoring organization
- Actively engage in discussion and bring constituent concerns to the table, as well as seek an increased understanding of others' views
- Speak candidly and bring their ideas and expertise to the deliberations to help inform the Committee's choices
- Communicate back to their communities/sponsoring organizations so representation is confident and surprises are minimized

State and federal agencies are participating as ex officio members and are present as resources to the Committee to offer perspectives and answer questions. They are not part of the Committee consensus.

IV. Decision Making and Consensus

Only funding mechanisms on which the Committee reaches consensus will be recommended. Consensus is defined as a funding mechanism that all members can "live with" even though it might not be the first, or even the preferred, choice of each. The Committee can expect that all

consensus recommendations will be made available to the Legislature and given serious consideration by WDFW and the Invasive Species Council.

In the event consensus is not reached, the full range of perspectives expressed by Committee members will be described in the Committee report and considered by the Invasive Species Council, WDFW, and the Governor's office in developing a proposal to take forward to the Legislature.

Consensus will be evaluated through a variety of techniques, including one-on-one conversations with Committee members, straw polling, and other methods. Throughout the process there will be documentation of Committee deliberations in meeting notes, the draft Committee report, and other documents (if needed); the primary purpose of these documents is to summarize Committee deliberations and explore and describe emerging and final Committee consensus.

V. Tentative Work Flow, Meeting Topics, Schedule, and Duration

The Committee will meet four or five times between September 1, 2015 and January 31, 2016, with the possibility of additional meetings if needed and if resources are available. Preliminary meeting topics are described below. In addition, Committee members will be offered a telephone interview with the Committee facilitator before the first meeting. The purpose of the interview is to gather information on each Committee member's individual perspectives and to begin to understand potential areas of consensus and information needed to support Committee deliberations.

Before first meeting:

- Telephone interviews with Committee members.

September 22 – First Meeting

- Overview of current aquatic invasive species programs.
- Overview of program funding need.
- Discussion of principles for identification of funding recommendations.

Between first and second meetings:

- Address any questions to ensure clarity on current program elements and funding need.
- Refine principles for identification of funding recommendations.

October 20 – Second Meeting

- Complete discussion of program elements and funding need, as necessary.
- Complete discussion of principles for identifying funding recommendations.
- Review initial list of potential funding mechanisms and brainstorm additions/clarifications.

Between second and third meeting

- Address any questions on potential funding mechanisms to ensure clarity.
- Review initial sections of draft Committee report.
- Straw poll or survey Committee members on potential funding mechanisms.

November 17 – Third Meeting

- Deliberation on potential funding mechanisms and potential recommendations.
- Deliberation of draft Committee report.

Between third and fourth meeting

- Refine potential funding recommendations.

December 15 – Fourth Meeting (potential)

- Continue to refine and complete potential funding recommendations and draft Committee report.

January 19 – Fifth Meeting (potential)

- Continue to refine and complete potential funding recommendations and draft Committee report.

AQUATIC INVASIVE SPECIES FUNDING ADVISORY COMMITTEE
GROUND RULES FOR MEETINGS

1. All members have equal opportunities to participate.

2. Discussions will stay within the objectives and scope of the Charter.

3. Members will strive for honest and direct communication, allow open discussion and the right to disagree, and look for opportunities to find common interests, agreements, and solutions.

4. Members will focus on clarifying their own views and interests; rather than on characterizing the views of other members.

5. Members and/or the facilitator may request a caucus break at any time during a meeting. In order to keep the flow of meetings on track, individual caucus breaks may not exceed 15 minutes.

6. The facilitator is a neutral third party with no stake in the outcome of the project. Ross Strategic will structure meetings to support a respectful atmosphere and the development of trust among members.

7. Meetings are expected to start and end on time.

Attachment 3: WDFW's Estimates of AIS Program Funding Needs

AIS Projected Budget Need (Based on 2014 Agency Request Legislative)

September 22, 2015

Budget Element	FY14 / $0.508m (Watercraft fee + $80k USFWS grant carryover)	Budget Need Target* / $4.1m ($3.6m new)
Permanent FTE	**3.75** (.75 regional)	**13.75** (6 regional)
Seasonal FTE	**0.1**	**6.5** (4 regional)
Administrative	• **Limited** state/regional coordination • **Very limited** budget/grant/contract management • **Limited** supervision • **Very limited** ballast water program management • **Limited** legislative proposals/ rulemaking	• **Comprehensive** overall capacity increase
Prevention	• **Limited** capacity to provide natural resource agency field gear decontamination trainings • **Limited** capacity to staff AIS information booths at boat, sport, and general outdoor shows	• **Comprehensive** natural resource agency field gear decontamination trainings • **Comprehensive** public field gear decontamination trainings • **Comprehensive** capacity to increase general media and outreach campaigns • **Comprehensive** capacity to conduct research and development of new AIS management methods

Budget Element	FY14 / $0.508m (Watercraft fee + $80k USFWS grant carryover)	Budget Need Target* / $4.1m ($3.6m new)
Early Detection Monitoring	• **140 sites 1x/yr** for zebra/quagga mussels	• **250+ sites 3x/yr** for zebra/quagga mussels • **Comprehensive** capacity for other high priority AIS monitoring (European green crab, NZMS, etc.)
Rapid Response Management	• **Limited** capacity to lead comprehensive management actions as needed • **Very limited** pre- and rapid response permit management (chemical use, ESA, SEPA, etc.)	• **Comprehensive** capacity to lead comprehensive management actions as needed • **Comprehensive** pre - and rapid response permit management (chemical use, ESA, SEPA, etc.) • **Comprehensive** capacity to provide technical assistance to local jurisdictions on planning or management actions for lower risk species • Conduct rapid response trainings
Infested Site Management	• **Limited** capacity to coordinate/ facilitate management actions as needed	• **Comprehensive** capacity to lead comprehensive management actions as needed • **Comprehensive** pre- and infested site response permit management (chemical use, ESA, SEPA, etc.) • **Comprehensive** capacity to provide technical assistance to local jurisdictions on management actions for lower risk species
AIS Local Management Grant	**N/A**	• **NEW: $1 m** (including administrative costs)
Enforcement Watercraft AIS Inspections	• **50** Mandatory check stations • **14,200** Total watercraft inspections	• **250** Mandatory check stations • **50,000+** Total watercraft inspections
Enforcement Investigations	• **10** Market/pet trade investigations	• **50+** Market/pet trade investigations

Budget Element	FY14 / **$0.508m** (Watercraft fee + $80k USFWS grant carryover)	Budget Need Target* / **$4.1m** ($3.6m new)
Enforcement Trainings	• **5** Trainings o WSP o USCBP	• **15+** Trainings o WSP o local Sheriffs o USFWS o USCBP o etc.

*Budget need target subject to change based on sal/ben changes, indirect rate changes, costs to implement fee programs, and other factors since FY14 calculations.

BW/Biofouling Projected Budget Need (Based on 2015 Agency Request Legislative)

September 22, 2015

Budget Element	FY14 / $0.342m (ALEA + $25k of Watercraft fee + $25k USFWS grant)	Budget Need Target* / $1.08m ($0.738m new)
Permanent FTE	**3.25**	**5.25** (2.0 new)
Seasonal FTE	**N/A**	**N/A**
Administrative	• **Limited** state/federal regional coordination • **Very limited** budget/grant/contract management • **Limited** supervision • **Very limited** ballast water program management • **Limited** legislative proposals/ rulemaking	• **Comprehensive** overall capacity to provide: o Full-time program management o State/federal regional coordination o Rulemaking to address BWTS integration o Rulemaking to address biofouling integration based on Davidson et al. 2014 report recommendations o Data management oversight o Compliance oversight o Budget/grant/contract management
Prevention	• **Very limited** technical assistance and outreach to vessel crews/agents	• **Comprehensive** capacity to provide: o Monthly data and compliance updates o Targeted outreach to vessel crews and agents o General outreach to public on program accomplishments

Budget Element	FY14 / $0.342m (ALEA + $25k of Watercraft fee + $25k USFWS grant)	Budget Need Target* / $1.08m ($0.738m new)
Early Detection Monitoring	• **315/yr average** vessel inspections by additional data management and increased enforcement duties	• **350/yr average** vessel inspections with improved administrative data management support • **New** biofouling vessel inspection system integration consistent with regional approach • **Comprehensive** capacity to conduct: o Conduct routine biological ballast water exchange sampling for effectiveness/risk management o Test/implement new ballast water treatment sampling systems o Conduct routine biological sampling of state marine and estuary waters for identifying existing or new infestations
Rapid Response Management	• **Limited** by staffing and lack of emergency treatment capacity	• **Comprehensive** capacity to provide: o Increased coverage of high risk vessel arrivals outside regular work schedules/hours o Test/implement new emergency treatment systems
Infested Site Management	**N/A**	**N/A**
BW/Biofouling Contracts	• **Very limited** by administrative capacity	• **Comprehensive** capacity to implement contracts for: o Biological sampling analysis o New biofouling database o Upgraded ballast water database o Clean-up and integration of pre-2008 data o Emergency treatment services o Ongoing technology/information needs

Budget Element	FY14 / $0.342m (ALEA + $25k of Watercraft fee + $25k USFWS grant)	Budget Need Target* / $1.08m ($0.738m new)
BW/Biofouling Compliance Investigations	• **Limited** by administrative and data management capacity (protocols, compliance plans, alternative strategies)	• **Comprehensive** capacity to: o Implement high risk vessel identification system based on Cordell et al. 2015 report recommendations o Consistently identify non-compliant vessels using improved database query systems o Follow-up high risk vessel identification with existing compliance plan and alternative strategy systems
BW/Biofouling Compliance Enforcement	• **Very limited** by administrative and data management capacity (Protocols, compliance plans, alternative strategies, penalties)	• **Comprehensive** capacity to: o Identify and assess penalties as necessary for repeat offenders
BW/Biofouling Compliance Trainings	• **Very limited** by administrative and inspector capacity (coordination with USCG vessel inspectors)	• **Comprehensive** capacity to: o Conduct/host regional state regulator inspection trainings o Develop regional inspection protocols for new BWTS o Cross-training with USCG vessel inspectors

*Budget need target subject to change based on sal/ben changes, indirect rate changes, costs to implement fee programs, and other factors since FY14 calculations.

6c
2-24-87

BEFORE THE BOARD OF CLALLAM COUNTY COMMISSIONERS, STATE OF WASHINGTON

In the matter of:)
) CR RESOLUTION NO. 21, 1987
Clallam County Roadside)
Vegetation Management Policy)

The Board of Clallam County Commissioners finds as follows:

I. WHEREAS, Clallam County seeks to effectively control vegetation within Clallam County road rights of way through mechanical, biological, cultural, and chemical means in order to develop a stable, low-maintenance, cost effective roadside vegetation management program, and;

II. WHEREAS, a policy should be adopted to guide vegetation management activities;

NOW, THEREFORE, in consideration of the above findings of fact it it hereby resolved,

That the Board of Clallam County Commissioners adopts the Clallam County Roadside Vegetation Management Policy, a copy of which is attached.

ADOPTED THIS 24th DAY OF February, 1987.

BOARD OF CLALLAM COUNTY COMMISSIONERS

Dorothy Duncan

Dorothy Duncan, Chair

Lawrence Gaydeski

Lawrence Gaydeski

Evan Jones

Evan Jones

ATTEST:

Karen Flores

Clerk of the Board

cc: minutes
Public Works

CLALLAM COUNTY

ROADSIDE VEGETATION

MANAGEMENT POLICY

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CLALLAM COUNTY ROADSIDE VEGETATION MANAGEMENT POLICY

I. Clallam County Integrated Roadside Vegetation Management Policy

It is the policy of Clallam County to minimize the use of herbicides for vegetation control along road rights-of-way, and to set specific goals and timetables for minimizing the use of herbicides, and implement an integrated approach to roadside management.

A. Objective

To effectively control vegetation within Clallam County road rights-of-way. Vegetation will be controlled within Clallam County through mechanical, biological, cultural, and chemical means in order to develop a stable, low-maintenance, cost effective roadside vegetation management program.

B. Description of Goals

1. To economically insure the efficient and safe operation of roads.

2. To ensure visibility for the safety of the driving public.

3. To provide a clear and safe right-of-way for pedestrians and bicycle traffic.

4. To provide the maximum amount of sunlight and air circulation which increases the life of the pavement and allows the snow and ice to melt faster in the winter.

5. To provide self-sustaining vegetation to control erosion on back slopes and mitigate areas prone to snow drifts.

6. To produce naturalized vegetation on the right-of-way that is self-sustaining and blends into the surrounding vegetation.

7. To reduce the opportunities for the migration and distribution of undesirable vegetation.

8. To comply with all Federal, State and County laws, ordinances and resolutions as they apply to the use and/or application of pesticides.

9. To implement a variety of vegetation control measures, seeking the minimization of chemical solutions.

10. To engage in an on-going program to upgrade the expertise of personnel in integrated vegetation management alternatives and the selection and safe application of herbicides.

11. To identify the criteria which will determine sensitive geographical areas, and to identify those areas.

12. To annually update and adhere to a long-range integrated vegetation management plan.

II. Definition of Integrated Program

An integrated roadside vegetation management program is one that advances the commitment to implement a variety of vegetation control measures, such as biological, mechanical, manual and chemical. It seeks to minimize chemical solutions based upon the level of vegetation infestation, its economic impacts, and an accurate assessment of the economic and ecologic consequences of each type of control.

A. Mechanical/Manual
Cutting or cultivating in such a manner so as to reduce or retard undesirable plant growth (i.e., using hand labor, mowers, graders, and ditching equipment).

B. Biological
The use of living organisms which destroy the host plant. Insects, diseases and foraging animals are examples of biological controls.

C. Cultural
Enhancing the vigor of desirable plants so they can eventually crowd-out the undesirable vegetation. Plant low-growing, self-maintaining shrubs.

D. Chemical
The use of herbicides and fungicides to stunt growth, and/or eliminate unwanted vegetation within a designated area.

III. Vegetation Management Maintenance Zones

In order to determine what vegetation maintenance results are needed along County road rights-of-way, Clallam County has divided the right-of-way into zones. The following defines each zone:

A. Zone 1 - Vegetation Free Zone
Section up to approximately 18" maximum from pavement edge of road to ditch line/shoulder edge on drivable shoulders where no vegetation should grow.

B. Zone 2 - Operation Zone
Section up to approximately 18" from pavement edge of road to ditch line/shoulder edge on non-drivable shoulders and from ditch line to right-of-way (backslope) where low growing vegetation should be maintained.

C. Zone 3 - Ditches
To maintain ditches so they are free of obstructions, allowing water to flow freely and protect the integrity of Fry (young fish) found in some of the County's ditches. Ditches will be maintained by non-chemical means east of the Elwha River.

D. Zone 4 - Special Requirements
1. Dangerous tree removal
2. Fence lines
3. Other

IV. Federal, State and County Laws and Restrictions

A. Pesticide Laws

1. Washington Pesticide Application Act - 17.21 RCW

The Act requires licensing for all individuals who apply and/or supervise application of pesticides. The licenses are issued by the Department of Agriculture after the applicant passes a comprehensive written examination in the classification(s) he/she will be dealing with.

- Public Applicator's License
- Commercial Operator's License
- Public Operator's License
- Private Commercial Applicator's License
- Private Applicator's License

The Act also stipulates rules which are to be followed when handling and applying pesticides. Those that are relevant to the County are:

- Restricted Use Herbicide Regulations
- General Application Regulations
- Applicator and Operator Regulations
- Applicator's Records
- Handling of Pesticides
- Pesticide Registrations
- Restrictions on Distributions, Transportation, Storage and Disposal

2. Department of Ecology

The Department of Ecology was given the administration of laws concerning clean air, water pollution, water resources and solid waste management.

- Chapter 15.58 RCW - Pesticide Control Act
- Chapter 70.95 RCW - Solid Waste Management Act
- Chapter 70.94 - Clean Air Act
- Chapter 90.48 - Water Pollution Control Act
- Chapter 76.09 RCW - Forest Practices Act
- Title 86 RCW - Flood Control
- Chapter 90.62 - Shoreline Management Act and Environmental Coordination Procedures Act
- Chapter 70.105 RCW - Hazardous Waste Management Act
- PL 94-580 - Federal Resource Conservation and Recovery Act

B. Resolutions/Ordinances

1. Special Restrictions

a. Clallam County Staff -
The persons responsible for supervising the Herbicide Application Program in Clallam County shall be in a management level of foreman or higher and possess a current Washington State Department of Agriculture Public Operator License.

b. Herbicide Applications -
Herbicides which are fully registered by the EPA shall be used before those with conditional registration. Herbicides shall be applied in accordance with the standards set forth by the State Department of Agriculture, Manufacturer's label/instructions and Clallam County's Roadside Vegetation Management Program.

c. Chemical Usage Restrictions -
Sensitive geographical areas in the County where spraying of herbicides will not take place. The criteria for identifying such areas will include:

- Citizen petition
- Ground water
- High use by pedestrian and/or children
- Department of Fisheries jurisdiction
- Department of Ecology jurisdiction
- Other criteria the Board of Clallam County Commissioners deems appropriate
- 200 foot buffer on both sides of stream or irrigation ditch at point where it crosses county road.
- Irrigation ditches - wetlands

V. Vegetation Management Method(s) Selection

The selection of method(s) used to maintain Clallam County's Roadside Vegetation is dependent upon many factors. The factors which are taken into consideration are:

1. Special Restrictions
   - Areas within Clallam County where Vegetation Management by chemical means will not be used.
   - Budget Restraints
     - Manpower available
     - Equipment available
2. The weed species to be controlled
     - grasses
     - broadleaf
     - woody plants
3. The location of the weed species
     - shoulder
     - ornamental planting
     - general brush
     - noxious weeds
     - ditches
     - backslopes
     - when water is present
4. Adjacent vegetation and land use
     - bee keeper
     - berry grower
     - grape grower
     - other
5. Soil conditions
     - clay vs sand
     - organic content
     - fertility
     - pH

VI. Integrated Roadside Vegetation Management Program

A. Clallam County Responsibilities
   1. Vegetation Management Alternatives

      To develop a Plan which utilizes a variety of

vegetation control measures and minimizes chemical solutions.

a. Test Plots

Ongoing testing sites will be established to evaluate various integrated vegetation management techniques. They should reflect diverse conditions in Clallam County.

Test plots will include, but are not limited to:

- Alternative Vegetation (cultural methods)
- Mechanical/Manual Techniques
- Outside Contracting
- No Maintenance
- Biological Control Experiments

Test plots shall be used to determine maintenance cost per right-of-way mile.

b. Vegetation Management Goals

- To research alternative vegetation management techniques.

- To develop an integrated management plan, minimizing the use of herbicides.

- To implement a state of the art integrated vegetation management program.

2. Personnel Training

a. State Pesticide Licensing Recertification

The Washington State Department of Agriculture has passed legislation which deems it necessary to obtain 40 hours of DOA approved education every 5 years in order to recertify State Pesticide Licenses. This legislation also states that a maximum of 15 hours shall be accredited in any given year.

The person responsible for supervising the roadside vegetation management program, its application and applying herbicides shall attend educational classes, seminars and meetings to enhance and upgrade their knowledge of vegetation management alternatives and the selection and safe application of herbicides.

A alternative vegetation management education

courses will be sought, and those individuals involved in Clallam County's Roadside Vegetation Management Program will enhance their vegetation management techniques by attending the appropriate courses available.

The continuing education program may include, but is not restricted to:

Integrated Vegetation Management Workshops

Annual Washington State Weed Conference
A 3-day seminar covering state-of-the-art vegetation maintenance techniques, laws, regulations, etc.

Northwest Applicators Annual Conference
This 1-day seminar can cover a variety of topics, from herbicide calibrations to safety.

Washington State University Short-Courses
A variety of classes are offered through Washington State University and the County Agriculture Extension Office(s). All courses offered pertain to "pest" control and maintenance.

B. Mowing Program

1. Objective

To control the growth of planted or wild weeds and grasses. To clean the edge of the roadside right-of-way, specifically shoulders and backslopes.

2. Equipment

The County may use one or more of the following mechanical mowers:

- Rotary
- Flail
- Sickle

3. Mowing Schedule

As a general rule, arterials are mowed three (3) times a year; access roads twice a year. The number of mowings will vary depending on the vegetation growth rate of the road locality and the vegetation components.

The mowing season is generally from March through October of any given year.

4. Record Maintenance

The mowing crew will individually turn in a Mower Report for each day they mow. The report provides the following information as to Maintenance Management recording requirements under Maintenance Management code N-4:

- Name of Operator
- Equipment Numbers
- Roads mowed
- Number of pass miles

In addition, a written fuel record will be maintained by each operator and turned into Accounting on a monthly basis.

Incoming calls requesting mowing service are documented on a Service Request Form, one copy submitted to the appropriate supervisor, one copy forwarded to Engineering and the third copy retained at Maintenance and Operations. The supervisor will document all activity pertaining to the request. The documented Service Request will be forwarded to Engineering.

C. Brushcutting Programs

1. Objective

To control the growth of brush, blackberries and small trees on backslopes; in ditches; around intersections, guard rails, traffic signs and other appurtenances.

Natural growth and vegetation which does not cause a visual hazard or potential roadway damage will not be disturbed.

2. Equipment

See Maintenance Management Activity Guide requirements under codes N-1 and N-2.

3. Schedule

The manual brushcutting crew will work approximately 2 months out of year. The mechanical brushcutting crew will work approximately 2 months out of the year.

4. Records Maintenance

A daily work summary will be prepared by the Records Clerk, documenting all brushcutting activities for a given day. This form provides the following infor-

mation as to requirements of Maintenance Management code N-1 and N-2:

- Name of Operator
- Equipment Numbers
- Roads Brushcut
- Number of miles brushcut (mechanical only)
- Number of paths brushcut per road (mechanical only)
- Material used

All incoming calls for brushcutting services are documented on a Service Request Form. One copy of the form will be submitted to the appropriate supervisor, another copy sent to Engineering and a third copy retained at Maintenance & Operations. The supervisor will document all activity done pertaining to the request and the documented form will be sent to Engineering.

D. Shoulder Picking or Blading Program

1. Objective

To remove the sod barrier that holds water at road edge. This is accomplished by blading sod from the road shoulder and picking it up with a belt loader and hauling it away on trucks.

2. Equipment

See Maintenance Management Activity Guide requirements under codes B-2.

3. Schedule

Present maintenance constraints limit shoulder blading to a six (6)-year cycle, going to a three-year schedule. Approximately 130 miles of roadside shoulders will be bladed yearly as a result of the adoption of this policy. This job will usually be scheduled during the winter months.

4. Record Maintenance

A preliminary list of all roads to be shoulder bladed will be prepared each year. This list will be updated as needed.

E. Ditch Digging Program

1. Objective

To maintain ditches so they are free of obstructions,

allowing water to flow freely, to protect the integrity of Fry and to inhibit erosion of ditchbanks.

2. Equipment

See Maintenance Management Activity Guide requirements under codes C-1 or C-2.

3. Schedule

The Ditch Digging Crew(s) work year round.

4. Records Maintained

All incoming calls for ditch cleaning will be documented on a Service Request Form. One copy of the form submitted to the appropriate supervisor, another copy sent to Engineering and a third copy retained at Maintenance & Operations. The supervisor will document all activity done pertaining to the request and the documented form will be sent to Engineering.

F. Biological Methods

Biological methods of vegetation maintenance will be researched and utilized when appropriate. Tests will be implemented to determine their effectiveness.

G. Herbicide Program

1. Objective:

To minimize herbicide use east of the Elwha River, herbicides will only be used 18 inches of the pavement; ditches and backslopes and gravel roads will not be sprayed. Areas countywide which are designated sensitive will not be sprayed.

2. Preliminary Requirements:

a. All herbicides used will be registered by the United States Environmental Protection Agency and the Washington State Department of Agriculture for that special use. No Herbicides with "experimental use only" or with "provisional use" permits will be used. First choice will be given to those fully registered. Inert ingredients will be identified when the information is available.

b. All herbicides shall be applied in accordance with the standards set forth by the State Department of Agriculture, Manufacturer's label/

instructions and Clallam County's Roadside Vegetation Management Program.

c. All persons responsible for applying herbicides will be licensed by the Washington State Department of Agriculture.

d. A written procedures and safety manual covering the selection, storage, transportation, application and disposal of herbicides will be maintained and updated to ensure "state of the art" selection and application of herbicides practices.

e. Health and safety information on every herbicide in use shall be made available to applicators and the general public through the offices of Public Works. Updated information will include known symptoms after contact or exposure, treatment and antidotes.

f. Emergency procedures in the event of an accident will be established and clearly posted where chemicals are mixed and stored.

g. All label restrictions will be carefully and strictly adhered to. In the case of a violation all spraying will stop until an investigation by Public Works.

h. Clallam County Commissioners will annually receive the Department of Public Works' Maintenance Management activities report including all roads in each road zone to be chemically treated and names of the herbicides. The Department of Public Works will be responsible for submitting the annual programs.

i. No County official or employee shall commence any herbicide application on any County road without the prior consent of the Director of Public Works.

3. Herbicide Selection

After meeting all requirements listed above, the selection of a herbicide is dependent upon:

- Weed species
- Location of weed species
- Type of herbicide; selective or non-selective
- Mode of action; contact or translocated
- Weather; rain, no rain, soil and air temperatures, wind direction and velocity
- Soil conditions

- Adjacent vegetation and land use
- Toxicity to insects, wildlife and fish
- Persistence in the environment

4. Equipment

Clallam County presently uses a 500-gallon tank on a single-axle truck with a Ciblo swinglock sprayer unit.

5. Herbicides Presently Used by Clallam County

Clallam County presently uses the following herbicides. All are conditionally registered by the Environmental Protection Agency and the Washington State Department of Agriculture. All herbicides have been approved for use by the Director of Public Works and the Board of Clallam County Commissioners has been notified in writing.

Roundup - A non-selective contact herbicide:
Active ingredient - isoprophlamine salt of glyphosate.

Oust - A non-selective soil residual herbicide:
Active ingredient - sulfometuron methyl.

Garlon 3A - A selective contact herbicide:
Active ingredient - Triclopyr.

Telar - For horse tail.

Herbicides will be researched and recommendations for County use made based on EPA registration, effectiveness, cost and safety.

6. Additives

Additives will be used to improve the surface area covered and reduce the drifting of the herbicides applied. Ingredients and all known health and safety information will be available and on file in Public Works for each additive used.

Presently one or more of the following are added to the herbicide tank.

- Surfactant:
  - R-11
  - R-20

- Drift Control:
  - Nalco Trol
  - Lo-Drift
  - Sta Putt

7. Citizens Options

Clallam County has established a program whereby in those areas where herbicides are used to maintain the roadside vegetation, residents who do not want herbicides applied to the road right-of-way in front of their property may yearly sign an "Owner Will Maintain" agreement and post the frontage of their property as no spray areas.

In these areas it will be the responsibility of the property owner to control the growth of vegetation so that visibility is not obstructed and vegetation does not intrude into the roadway.

8. Citizen Notification

To give Citizens a minimum of two weeks prior notification of the intent to apply herbicides. Notification of the intent to begin the spray program will be through all news media.

Notices will include:

- General areas to be sprayed
- Name of herbicides to be used, toxicity, and antidotal information
- Approximate number of miles to be treated
- Person and telephone number to contact for information and/or to register protests
- Right to enter into "Owner Will Maintain" agreements

9. Posting Spray Areas

Signs will be conspicuously posted in the area(s) to be sprayed at least two (2) weeks prior to actual spraying. These signs will include: anticipated date of spraying, herbicide(s) to be used, toxicity and antidotal information and the road(s) to be sprayed.

Immediately following the use of herbicides, the notices along the roadways shall be changed/altered to state that spraying has occurred, naming the chemical(s) used.

10. Spraying Schedule

Spraying will occur during the following schedule only:

Shoulder spraying starts March 1st and ends May 31st between daylight and 1:00 p.m.

Herbicides will not be applied in winds greater than 5 m.p.h., and only when the air temperature is above 33 degrees.

11. Records Maintained

a. Incoming Telephone Calls

A log will be kept on all incoming herbicide telephone calls. This log will include:

- Date of telephone call
- Nature of complaint
- Summary of conversation
- Caller's name, address and telephone
- Information given by individual receiving the call
- Name of individual who talked with caller
- When/if questions from caller are referred to another individual, that individual's response

b. Application Records

Accurate records shall be kept on all herbicide applications. The records will be kept at least 20 years and shall include:

- Date of application
- Location of application (shoulder, spot spraying, etc.)
- Name of Road/area sprayed
- Chemicals used per application/location
- Quantity of active ingredient of chemical used per application/location
- Equipment used
- Name of applicator and driver
- Weed(s) sprayed
- Expense record itemized by type of application and area sprayed

VII. Vegetation Management Related Injury and Property Damage Documentation

A. Tort Claims

All personal property damage allegedly resulting from Clallam County employees and/or equipment during roadside vegetation maintenance is and will be documented and handled by the Prosecuting Attorney's Office.

B. Workman's Compensation Claims

All Clallam County employees injured while maintaining roadside vegetation will complete an Incident Report at Central Shop documenting the accident. The form will be forwarded to the Clallam County Safety Director or Risk Manager, Director of Public Works and the Prosecuting Attorney's Office.

A Workman's Compensation form will be completed for each incident resulting in a visit to a doctor. County expenses are maintained by and available through the Safety Director or Risk Manager.

C. Clallam County Property Damage

All damage to Clallam County property resulting from roadside vegetation maintenance will be documented on an Incident Report Form and forwarded to the Prosecuting Attorney's Office.

Total costs for damage will be available through the Prosecuting Attorney's Office.

BEFORE THE BOARD OF CLALLAM COUNTY COMMISSIONERS, STATE OF WASHINGTON

In the matter of:)
) CR RESOLUTION NO. 44, 1990
Amending Clallam County's)
Roadside Vegetation)
Management Policy)

The Board of Clallam County Commissioners finds as follows:

I. WHEREAS, Clallam County seeks to effectively control vegetation within Clallam County road rights of way through mechanical, biological, and cultural means in order to develop a stable, low-maintenance, cost effective roadside vegetation management program, and;

II. WHEREAS, the present policy allows the use of herbicides which have been an increasingly objectionable method of management to citizens of Clallam County, and;

III. WHEREAS, the mechanical, biological, and cultural methods are more costly but can be used to replace herbicides;

NOW, THEREFORE, in consideration of the above findings of fact it it hereby resolved,

That the Board of Clallam County Commissioners amends the Clallam County Roadside Vegetation Management Policy to eliminate the use of herbicides.

ADOPTED THIS 10th DAY OF July, 1990.

BOARD OF CLALLAM COUNTY COMMISSIONERS

Dave Cameron
Dave Cameron, Chair

excused absence
Dorothy Duncan

Lawrence Gaydeski
Lawrence Gaydeski

ATTEST:

Karen Flores
Clerk of the Board

cc: Public Works
Minutes
Files

CLALLAM COUNTY INTEGRATED ROADSIDE WEED MANAGEMENT PLAN

Plan Prepared By:
Cathy Lucero, Clallam County Noxious Weed Control Program
in consultation with
Dr. Harvey Holt, Professor Emeritus, Purdue University,
Green Systems Analytics, LLC

2016

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The Cover: photos, from top knapweed weevil (biological control agent) on meadow knapweed flower head photo credit Laura Parsons, University of Idaho; weed board staff digging tansy rosettes from county roadside; selective herbicide treatment for elk habitat restoration; distributing native blue wildrye grass seed post treatments; Forest Service sign indicating weed free forage requirements, pollinator-friendly forage packets distributed by county weed board through Washington State weed board program.

We'd like to thank the many reviewers whose valuable insights and suggestions are reflected in this document.

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US Fish and Wildlife Service

Laurel Baldwin
Whatcom County Noxious Weed Control Board

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US Forest Service

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Affiliations for identification purposes only

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CLALLAM COUNTY INTEGRATED ROADSIDE WEED MANAGEMENT PLAN

INTRODUCTION

Clallam County is a major landholder subject to Washington State weed laws RCW 17.10 and WAC 16-750 which mandate the control of specific non-native, invasive “noxious” weeds. An integrated roadside weed management plan is needed to help the County efficiently comply with its noxious weed control obligation on county roadsides.

The primary responsibility of the Clallam County road system is safety in the transport of people, goods, and services. Roadside weed management is a unique element within a general road maintenance program. Effective weed management involves understanding how plant communities are part of a dynamic process. Healthy, self-sustaining plant communities better compete with weed pressure. Therefore, the Integrated Roadside Weed Management (IRWM) plan shall support management practices that create naturally stable, sustainable plant communities over time.

The IRWM plan must be consistent with Clallam County’s long term goals for its road system including environmental and public safety considerations. The IRWM plan will strive for a balance of multiple, but compatible goals, such as reducing maintenance costs for weed control over time, while increasing environmental services. Other considerations will include protection and preservation of the natural environment, preserving and enhancing the scenic and habitat quality of the roadside, and being a good neighbor to adjoining property owners.

This document serves as the strategic plan for managing non-native invasive plants that infest county rights-of-way. It contains information on priority weed locations, and guidelines and procedures for best management practices in weed control. This plan is developed in compliance with Washington State Noxious Weed Law, Chapter 17.10 of the Revised Code of Washington, and modeled on the State of Washington’s Integrated Pest Management program as codified in Chapter 17.15 of the Revised Code of Washington. Specific County legislative direction upon which this plan is based is codified in Chapter _____ Clallam County Code (Appendix A).

Roadside weed management is an evolving process, and it is intended that this plan be annually evaluated and adapted over time based on input and technical updates from federal and state agencies, tribes, universities and local partners and cooperators. It is essential that the results of control activities are evaluated and adjusted as necessary to maximize efficiency and effectiveness. Best Management Practices (BMPs) for each weed program element with continued research and education will provide important information for ongoing Integrated Weed Management (IWM) treatments.

Clallam County is also requesting that local public and private entities with an interest in weed control provide input on the plan and cooperate in efforts where appropriate. Additional copies of the draft plan are available online: _____, hard copies can be provided upon request.

Please contact the County. at the numbers listed below for questions or comment

Cathy Lucero, 360-417-2442 or Ross Tyler, 360-417-2379

WHY CONTROL ROADSIDE NOXIOUS AND INVASIVE WEEDS?

Noxious weeds impact native ecosystems by reducing biodiversity, altering hydrologic conditions, altering soil characteristics, changing fire intensity and frequency, modifying successional pathways, competing for pollinators, displacing rare plant species, serving as reservoirs of plant pathogens, and by replacing complex native communities with simple non-native ones. Noxious weeds cause economic impacts. In general, noxious and invasive weeds are expensive to control and negatively impact agricultural and forestry production, property values, water flow and availability, and recreation opportunities. It is estimated that invasive plants cause about $123 billion in damages and losses to the U.S. economy annually (Harper-Lore, Johnson, and Skinner, 2007). Non native weeds cause an estimated $34 billion in losses to crops and pastures alone (Pimentel, McNair et al., 2001).

For these reasons, Washington State law requires the control of certain weed species. The purpose of the law is to limit economic loss and adverse effects to Washington's agricultural, natural, and human resources due to the presence and spread of noxious weeds in all terrestrial and aquatic areas in the state. The processes for regulation and control are defined in the Revised Code of Washington Chapter 17.10. and the Washington Administrative Code Chapter 16-750. All landowners, public and private, are required to control noxious weeds on lands they own.

Transportation rights-of-way are high priority locations for control of noxious weed species because they cross and link so many adjacent properties and land uses, and can act as conduits for the spread of weeds. Weeds often appear first along road corridors.

Clallam County must be a responsible steward of county owned land. It supports commerce and the economic viability of the agricultural community. The County also values environmental preservation. It has taken the lead on projects to restore ecosystem function. The County promotes tourism and recreational opportunities. All can be undermined by the spread of invasive plants. To meet its responsibilities, the County must ensure noxious and invasive weeds are effectively and efficiently controlled on its rights-of-way (Figure 1, A and B).

Figure 1A. The herb Robert monoculture shown here, dies back to bare ground, does not filter pollutants, is susceptible to erosion, and exudes chemicals to inhibit the germination of native species.

Figure 1B. A low growing, naturally sustainable plant community is compatible with right-of-way goals while providing environmental services and quality habitat.

INTEGRATED WEED MANAGEMENT

INTEGRATED WEED MANAGEMENT

Integrated Weed Management (IWM) is a coordinated decision making process that uses the most appropriate weed management methods and strategies, along with a monitoring and evaluation system, to achieve roadside maintenance goals and objectives in an environmentally and economically sound manner. This includes assessing potential non-target impacts that may occur as a result, and minimizing adverse effects through best management practices. The principles of IWM dictate that each weed problem is addressed from the perspective of all control options. The selected mix of control methods is the best treatment for the long term stability of the plant community. Stable plant communities become established when the desired plants are not disturbed by the control program for the undesired plants. The physical design of the roadside environment coupled with the sporadic occurrence of noxious weeds imposes restrictions on the selection of control methods.

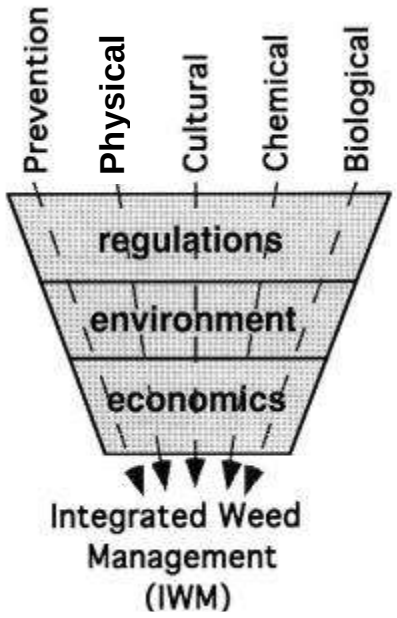

Figure 2. Factors influencing IWM program.

CHOOSING CONTROL METHODS

Weed control methods include biological, chemical, cultural, physical, and preventative. Each has its strengths and weaknesses influenced by regulations, environment and economics (Figure 2). A consideration of potential non-target impacts also plays a role. (See Appendix B for risk assessments)

Biological (such as releasing insect agents) and physical methods (such as mowing) use fewer labor resources. These are best for managing and slowing the spread of, but not controlling or reducing, widely dispersed weed infestations. Mowing is non-selective and can spread weed seeds or other viable propagules. Biological agents can be extremely selective, but require specific conditions. Both must be repeated indefinitely to suppress the weed population. Neither will eliminate populations of most weeds without using other techniques in combination.

Physical methods such as hand pulling or digging are labor intensive but can effectively control or eliminate small weed infestations of limited distribution. While highly selective, such methods are unlikely to control deeply rooted weeds or weeds with spreading root systems.

Herbicides can effectively and selectively control all sizes and types of weed infestations with a small, but knowledgeable workforce. Careful attention must be paid to minimize potential non-target effects and to follow all relevant regulations. See Appendix B for analysis of non-target impacts and risk assessment. Weather or site conditions can limit use.

Cultural and prevention practices are the most cost effective and efficient in the long term. These methods are more indirect and best used in tandem with the others. As current weed populations are eliminated, the goal is to shift control measures toward cultural practices such as use of native seed mixes and less disturbance of native shrub communities, as well as prevention practices such as weed-free material standards and cleaning equipment between job sites.

Use of the most effective method or combination of methods within an IWM decision-making framework will result in the greatest roadside service levels at the lowest life-cycle costs. Figure 3 demonstrates some of the feedback loops involved in an IWM strategy.

The IRWM Decision-Making Process

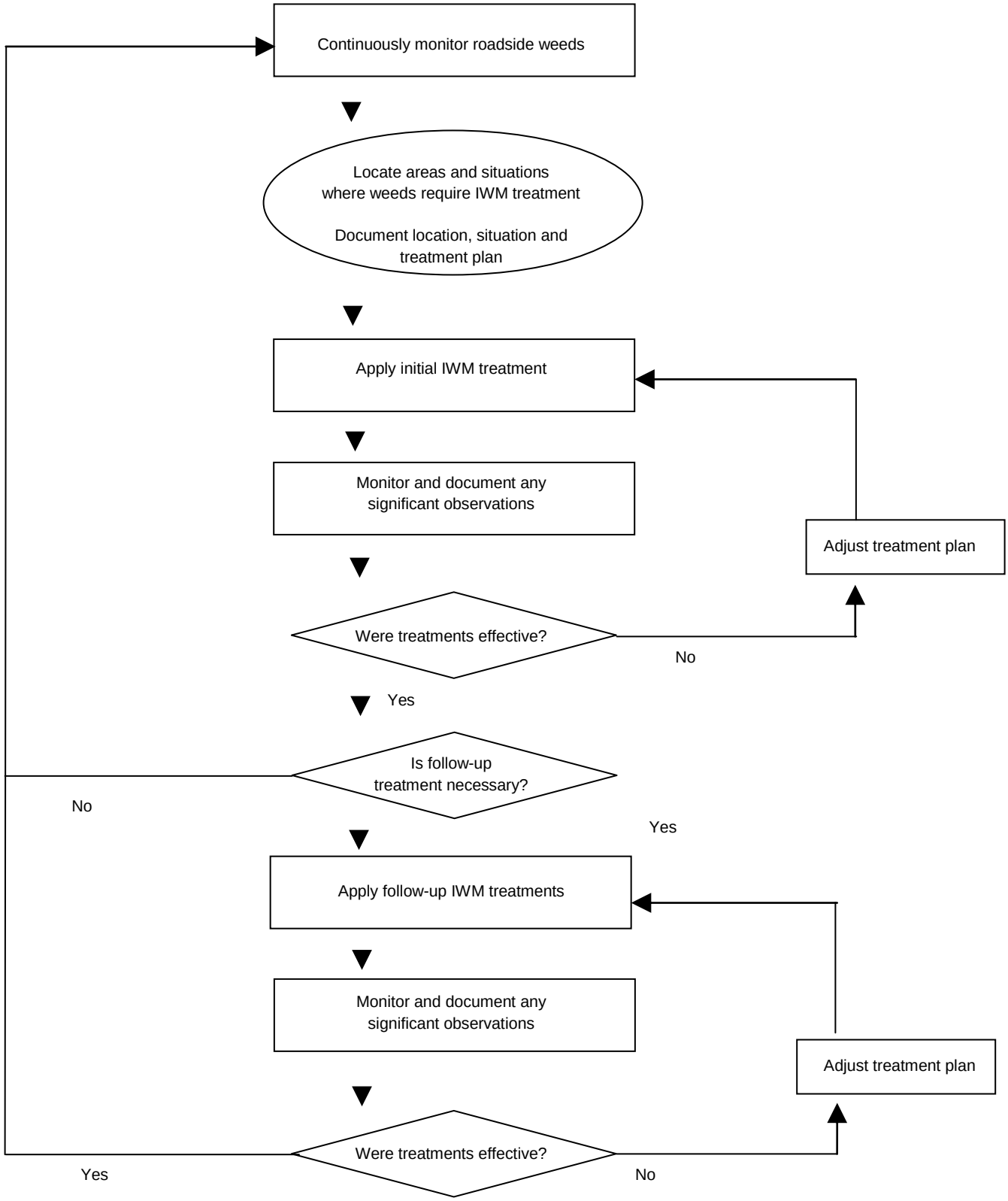

Figure 3. The continuing flow of monitoring, evaluation and adapting treatments occurring in an IRWM program (adapted with permission from WSDOT area management plans).

BIOLOGICAL WEED CONTROL

DESCRIPTION

Methods which use living organisms to inhibit a host plant's ability to survive or reproduce are considered biological controls. Insects, diseases, and foraging animals, such as goats and cattle, are examples of biological control organisms. Biological methods are typically applied only when weed infestations are so well established that total eradication is not practical or possible.

GENERAL USE CONSIDERATIONS

Insect biocontrol agents are routinely inexpensive to maintain, but their populations lag behind the development of the weed population. Careful testing and screening is done before releasing insect agents to ensure they will not also attack native or other desirable plants. Insect predators are intended to be very weed-specific, though insects are not available for many weeds. They are usually part of regional programs of which the roadside right-of-way is an incidental beneficiary. Livestock grazing has the same effect as mowing; it removes the top growth without disturbing the roots so perennial plants re-grow as soon as grazing pressure is removed. Grazing animals can suppress desirable bee and butterfly forage, create bare ground or otherwise disturb the shoulder making it prone to reinfestation and erosion. Measures must be taken to ensure that animals do not destroy desirable vegetation on adjoining land. Contiguous acres are usually needed for successful biological control. Biological controls can reduce populations, but can never result in eradication. The use of disease organisms as a form of biological control, is still very limited.

ROADSIDE APPLICATION

There are several limitations and hazards associated with using grazing animals on Clallam roadsides. Most importantly, many of the noxious and invasive weeds targeted for control are sporadically dispersed along the road system and not easy to selectively target by grazing animals. Biological control is applicable where host weeds are present in dense or continuous colonies. All available insect agents have been released or are present for control of noxious weeds within Clallam County (Table 1).

LIMITATION

Grazing: *not considered for use at this time*

- Grazing animals on narrow right-of-way pose a hazard to motorists
- Insufficient grazing area
- Creates bare ground
- Targeted species are distributed in such a way that makes grazing inefficient and less selective

Insects:

- Insect agent unavailable for many weeds
- Non-contiguous infestation or insufficient host density
- Minimal disturbance is required for insect population to grow to an effective level; often conflicts with routine mowing schedule
- Will not eliminate weed populations, only suppress them

Table 1. Insect biocontrol agents in Clallam County

Biological Agent	Latin Name	Target Weed	Comments
Bindweed gall mite	*Aceria malherbae*	Bindweed sp	Generally for field bindweed, but experimental use for hedge bindweed; best for hot, dry sites; these are new releases
Bull thistle seed head gall fly	*Urophora stylata*	Bull thistle	Seed feeder; not compatible with other control methods; may be present already
Canada thistle stem gall fly	*Urophora cardui*	Canada thistle	Metabolic sink, reducing vigor; not compatible with other control methods; three additional agents had been previously released (not by us!) for thistle control, but very detrimental to native thistle species.
Banded gall fly and knapweed seed head fly Lesser knapweed flower weevil and blunt nosed flower weevil	*Urophora quadrifasciata and U. affinus* *Larinus minutus and L. obtusus*	Knapweed, meadow	Flies often destroyed by seed weevils when both agents occur together Seed feeders
Knapweed root weevil Lesser knapweed flower weevil and blunt nosed flower weevil	*Cyphocleonus achates,* *Larinus minutus, and L. obtusus*	Spotted knapweed	Root weevil can be very effective, but limited distribution Seed feeders
Sap-sucking psyllid	*Aphalaris itadori*	Knotweed sp.	Experimental releases only in WA
Defoliating hemlock moth	*Agonopterix alstroemeriana*	Poison hemlock	Not effective, no longer distributed
Black-margined loosestrife beetle	*Galerucella calmariensis*	Purple loosestrife	Highly effective even in low density infestations, some non-target effects
Tansy flea beetle Cinnabar moth	*Longitarsus jacobaeae* *Tyria jacobaeae*	Tansy ragwort	Best on rosettes and seedlings; poor survival in wet areas; a Swiss ecotype was released in the hopes of increased survival A generalist that feeds on all plants in the *Senecio* genus, **distribution not recommended** -danger to native plants
Seed-feeding bruchid Seed-feeding weevil	*Exapion fuscirostre* *Bruchidious villosus*	Scotch broom	Seed eaters
Klamath weed beetle	*Chrysolina quadrigemina*	St. Johnswort	Feeds on ornamental and native species also; present; not well adapted to our climate

APPLICATION GUIDELINES

- Grazing may be possible under specific "Owner Will Control" option
- Release additional viable insect agents should they become available.

MAINTENANCE

None required at this time.

PHYSICAL WEED CONTROL

DESCRIPTION

Physical control includes both mechanized and manual methods. Mechanical methods use equipment to mow, cut, prune, scrape or cultivate in a manner which reduces, removes or prevents undesirable plant growth. A variety of machines are used in a roadside program, such as flail, reel, sickle, and rotary mowers, which come in different sizes, and graders, which are used to pull shoulders and remove sod buildup. Brush cutting is usually done with machines that are larger and heavier versions of rotary mowers. Mechanical methods are for larger scale general vegetation maintenance activities.

Manual methods include hand-held tools such as bladed weed-eaters, string trimmers, chain saws, brush hooks, hoes, and machetes; mechanical methods on a small scale, as well as grubbing and pulling weeds. Hand pulling is generally reserved for small or difficult to access sites or where greater selectivity is required. Repeat treatments are required for many species.

GENERAL USE CONSIDERATIONS

Mechanized equipment is typically used to non-selectively suppress undesirable or excessive vegetation growth on a large scale; not specifically to control weeds. Mechanical tools such as mowers do not affect the roots of plants, and cut plants often resprout in greater numbers. This is particularly true of weedy biennial and perennial forbs or shrubs. Many weeds respond to mowing by shorter regrowth and producing seeds on stalks below the blade height. Properly timed or frequent mowing can delay or prevent seed development during a growing season, but improperly timed mowing results in spreading propagules over a broad area. Sod scalping causes erosion potential and creates sites for weed invasion.

Weed suppression by mowers is temporary and must be repeated to achieve the desired effect. Without specific guidelines, mowing is non-selective in its effect on the plant community. Many desirable native plants grow more slowly than their weedy, invasive cousins. Desired and undesired plants are continuously reduced to the same height, the same starting point, with each mowing. Some weeds are spread by the mowing operation. Stable plant communities, an expressed objective of the county's roadside program, are not retained under heavy mowing pressure. Unless carefully timed, close mowing may be disastrous for ground nesting birds, animals, and pollinator forage. Mowing also has a large carbon footprint in comparison to other control strategies and machinery can leak hydraulic fluid and shed other hazardous substances into ditches and other sensitive environments.

Special considerations for this management option are necessary due to exposure to hazards such as noise, sharp power equipment and road traffic. Extra alertness is necessary. Protection for eyes, ears, hands, legs, and feet is required when using these tools. Alternative mechanical methods such as steam or flame have been investigated. Both steam and flaming work by destroying top growth and are best used when plants are first germinating, not when well established. Both have little effect on roots. Additionally, steam and flaming pose significant hazards for the operator and the environment and are very costly. These methods are not being considered for inclusion at this time.

Manual methods are commonly used for small infestations. This technique is effective in treating areas where obstructions prohibit mechanical methods. Hand pulling can be very selective and may be reserved for sites where extreme selectivity is critical and the infestation is small. Grubbing and hand pulling rely on moist soils and can be performed during inclement weather. These methods are labor intensive, slow, disturb the soil, and are usually expensive compared to other methods. As with other physical methods using mechanized equipment, manual treatments that do not extract all the roots of perennial plants will result in resprouting.

ROADSIDE APPLICATION

Physical control methods, both mechanical and manual, have been the preferred method for roadside vegetation management in Clallam County for many years. Mowing and brushing activities are an indispensable part of maintaining road safety by preventing line-of-sight obstructions, reducing fire hazard, preventing flooding, and ensuring biofiltration of hazardous runoff. Reach mowing is the practice of clearing vegetation, primarily brush and small trees, from the right-of-way. Work is accomplished with a rotary or flail mowing head attached to an extendable boom mounted to a tractor. This practice includes ditches and intersections. Clearing undesirable brush and trees from ditches encourages the growth of desirable grasses. This helps maintain the bio-filtration function of grass, resulting in cleaner runoff water.

The road department strives to make one complete mowing pass per year; more at intersections or critical locations. Right-of-way mowing and brushing can occur from spring to early fall when shoulder vegetation is actively growing and ongoing shoulder maintenance is required. Mowing does not normally reduce weed infestations, but can provide temporary suppression. It is best used in close coordination with other weed control methods. In general, perennial weeds like Canada thistle must be mowed at least three times per season or the weeds are invigorated.

The road department funds sheriff department-led chain gangs which provide a valuable manual workforce. Manual weed control activities will be incorporated into their assigned duties. Chain gangs will be the backbone of weed control activities that require a large labor force. They will be directed to work on large infestations of easily recognized weeds that can be effectively pulled such as flowering tansy ragwort and Scotch broom.

Under the IRWM plan, road shop supervisors will work closely with the environmental coordinator, noxious weed control coordinator, and right-of-way weed crew lead and coordinate with the mowing crew to ensure that all work is performed in accordance with Endangered Species Act and water quality requirements and state weed laws. Critical areas have been identified ensuring that mowers will know which areas and locations require special consideration. Appropriate guidelines have been developed for these locations. Changes and updates are done as necessary.

LIMITATION

- Mowing suppresses weed infestations; but does not control. Where control is desired, mowing is not recommended unless in combination with other control measure.
- Tough perennial weeds, especially those with extensive roots, are difficult to control using only physical means.
- Pulling or digging weeds is most effective when ground is soft.

APPLICATION GUIDELINES

- Avoid close mowing of desirable, native vegetation. Limit back slope mowing as much as possible. Avoid mowing the back slope in critical areas.
- Resurvey mowed roads to locate weed regrowth.
- Do not mow knotweed infestations; mowing encourages re-sprouting, may spread fragments capable of producing viable plants, and makes other treatments less effective. Consult crews responsible for weed control recommendations.
- Manual methods may be applied where practical and conditions favorable.
- Digging should be limited to individual plants or very small infestations.
- Limit digging of perennial weeds or those with deeply spreading roots unless they are newly established
- Pull and bag the heads of flowering plants. Dispose of appropriately.

Personnel

The mowing program is currently staffed with three employees who mow, as time allows, between other road maintenance duties. The road department funds two chain gangs that are comprised of up to five low-risk offenders overseen by a corrections officer. The chain gangs perform various tasks as directed by the road department. Weed Board staff digs minor regulated weed infestations as conditions and resources allow to help the County achieve compliance with law.

Training and Licensing

On-the-job training
Monthly safety trainings
Annual weed, native plant identification, and weed control training in conjunction with the Noxious Weed Control Program

Equipment

Various mechanical mowers and tractors with mowing attachments, weed whackers, chainsaws, weed wrenches, shovels, dandy diggers, and *hori-horis* (specialized digging tools).

Maintenance

- Regular maintenance and inspection of mowers and mower heads to minimize leaks or potential spills.
- Operators will be familiar with a spill prevention plan and carry spill kits.
- Ongoing training in critical areas issues for operators.
- Recurrent weed identification training for chain gang.
- Ongoing improvements in equipment.

PERFORMANCE MEASUREMENTS

- Number of weeds pulled
- Number of volunteer events
- Mowing – number of roadside pass miles. Pass miles count each shoulder mile mowed including those that are mowed more than once in a given year. The goal is to reduce this parameter while satisfying public, safety and regulatory responsibilities.

CHEMICAL WEED CONTROL

DESCRIPTION

Herbicide applications target specific noxious weeds or non-native and invasive species of special concern in our area that have been identified by the Clallam County Noxious Weed Board, state or federal agencies. Applications are made with herbicides selected for their effectiveness on the weed being targeted and may be applied using backpack sprayers or other handheld equipment as determined appropriate by the site conditions and/or the target weed.

GENERAL USE CONSIDERATIONS

Herbicide applications are a less physically, labor intensive means of controlling large weed infestations. Herbicides are the most effective way to control deeply rooted, persistent weeds. Properly applied herbicides can suppress weed germination and allow desirable vegetation to flourish with minimal effort. However, herbicides may not be appropriate under certain site or weather conditions, and require more complex decision making and staff training than most other control measures. In Washington all herbicides must undergo a registration process in addition to that required by the Environmental Protection Agency before they can be legally applied. Washington's pesticide laws may require an applicator be licensed.

Choosing an herbicide application requires carefully considering the level of weed infestation, economic impacts, and human and ecologic consequences. When a chemical measure is chosen, optimal effect is achieved through proper herbicide selection, timely application, proper application method, and the use of the effective rate of herbicide.

Herbicide use may differ depending on the setting. Spot applications of herbicides in a noxious weed control program are often used to control individual plants, while in agricultural settings, broadcast applications to entire fields are common. A limited number of chemicals are typically used for noxious weed management compared to those used in agriculture. In a successful weed management program, the amount of herbicide used on a particular site will decrease over time as the invasive plant population declines.

An herbicide's potential risk is assessed by the Environmental Protection Agency before the product is registered for use. A clear understanding of the risk of using a particular herbicide requires knowledge of the toxicity of the herbicide as well as the likelihood of exposure. Toxicity is a measure of how harmful any chemical compound is. It can be measured in many different ways and evaluated for many different biological systems. However, a chemical cannot have any effects on an organism without an exposure. Because noxious weed management with herbicides necessarily introduces chemicals into the environment, the challenge is to estimate the amount of exposure (the dose) for humans and different types of animals, as well as non-target plants. The presence of an herbicide in the environment poses less risk if the exposure for non-target organisms is sufficiently low that it is unlikely to have a negative impact.

An assessment of risk involves understanding the toxicity and likely exposure paths for various organisms that may be exposed to an herbicide. Risk assessments are used by project managers to identify those exposures that might be problematic. The project manager then uses this information to decide whether herbicides can be used without undue risk and to develop mitigation actions to reduce risks.

Several concepts are important in minimizing adverse effects. At a minimum, herbicide users should be familiar with:

1. The relative risk posed by the herbicide to the applicator and general public, and the anticipated exposure scenarios.
2. The types of wildlife and vegetation present, including endangered species. The invasive weed manager should learn enough about each species (life cycle, breeding habitat, food supply, shelter needs, etc.) to avoid impacts.
3. The relative risk posed by the herbicide to different wildlife and plant taxa that may be present and the anticipated exposure scenarios. Consideration should be given not only to the active ingredient, but also other compounds added to an herbicide formulation or added to the "tank mix" to be applied, such as surfactants.
4. The relative persistence of the herbicide in the environment, primarily in soil. Herbicide persistence is measured in terms of "half-life." One half-life is the amount of time it takes for the herbicide to break down to 50% of its original concentration in soil or water. As a general rule, it takes five half-lives for more than 97% of the herbicide to be fully degraded. Herbicide persistence is discussed in more detail in Appendix B.
5. The mobility of the herbicide in runoff water. Off-site movement in surface water and leaching to groundwater are both primarily influenced by the amount applied, the herbicide's water solubility and its tendency to adsorb to soils. Factors affecting herbicide mobility are discussed in more detail in Appendix B.

ROADSIDE APPLICATION

It is the explicit goal of this IRWM plan to minimize the use of herbicides whenever practicable, while shifting roadside vegetation to natural, self-sustaining, site-appropriate plant communities. Activities that create bare ground in the course of controlling weeds will be avoided, or be limited in duration, to prevent reinvasion by other weed species. Revegetation of bare ground with desirable plants will be promoted wherever opportunity exists.

Each species will have a Best Management Practice (BMP) specific to that species, developed and provided by the Clallam County Noxious Weed Program. Product label guidelines for timing and rates will be observed for best results. Herbicides may be used in conjunction with other practices, including biological and physical.

Most of the herbicides used in noxious weed control are of fairly low toxicity; however, not all herbicides have equal impacts. For example, some may pose greater risks to aquatic life and are not approved for use in aquatic settings. Others have long-lasting pre-emergent herbicidal activity that may restrict plant emergence or growth for several months after treatment. In areas that are to be re-vegetated soon after treatment, these herbicides may not be the best choice if their residues

remain biologically active in the soil after desirable plant species are seeded or transplanted.

Herbicide products chosen for this program are ones that maximize effectiveness, selectivity, and safety. Appendix B provides herbicide toxicity and possible exposure scenarios for wildlife. The analysis presented in the Cal-IPC document from which this information was reproduced, was based on the best available scientific data. Herbicide users are reminded of the need to keep in mind that risk analysis is a dynamic, ongoing process, as new data is generated on exposure potential and toxicity. Future studies or refined analyses may reveal risks that were previously unknown; alternatively, they may provide assurance that risks are actually lower than previously understood. With this in mind, invasive weed managers must stay informed about the latest technical developments about the chemical and non-chemical strategies they use.

The way in which herbicides are applied can enhance efficiency and safety goals. Spot, foliar treatments with backpack sprayers or even more selective hand held equipment (such as wick applicators or injectors) will be the most commonly used application method. Spot treatments can release or protect habitat for wildlife such as pollinators, song birds, and small mammals. Spot treatments reduce potential for offsite chemical drift. No broadcast treatments with mechanized equipment are being considered.

Herbicide applications to any particular site will be limited to one or two per season, depending on the weed target. The general treatment period for noxious weeds will be during the growing season when the weeds are in full leaf. Treating before bloom focuses on preventing seed production, treating after bloom focuses on herbicide translocation to the roots as the plant restores food levels in the roots. Late season treatments need to be timed so that green living leaf and stem growth is still present. Fall applications are effective for controlling germinating winter annuals, biennials in the rosette stage, and moving herbicide to the roots of established perennials.

All herbicides used by Clallam County are currently registered by the U.S. Environmental Protection Agency (EPA) and the Washington State Department of Agriculture (WSDA). Application of herbicides is in accordance with WSDA standards and chemical labels. County employees who apply the herbicides are licensed by WSDA. In addition, these employees undergo continuous training to upgrade their expertise in the selection and safe application of herbicides. Herbicide labels, Safety Data Sheets (SDS), WSDA sensitive person list, a safety plan, and this document are kept in the office and in the weed control truck.

Herbicide Selection Process

Several factors contributed to selecting particular herbicides to control noxious weeds on Clallam County roadsides.

- **EPA Approved for Roadside Use --** All of the selected herbicides are fully labeled for use on roadsides and are registered for use in the state of Washington. The herbicide label does not have to list all the weeds, but the label does have to list roadsides or rights-of-way as a use site.
- **Effectiveness on Target Species –** AquaNeat and Polaris are very broad spectrum and will control most of the county's noxious weeds. Milestone, Transline, Element 3A, and 2,4-D are selective and very effective only on broadleaf plants. Fusillade II is effective only on grass species. Many of the targeted weeds have a perennial life cycle with persistent root systems. Effective control requires translocated herbicides that kill the roots. All of the selected herbicides translocate to the roots.
- **Selectivity –** Several of the herbicides were chosen because they selectively target broadleaf weeds, not grasses. This allows grass to be unaffected and to colonize space previously occupied by broadleaf weeds. The grass herbicide gives the program a selective chemical for controlling weedy grasses, such as reed canarygrass, in a mixed plant community.
- **Human and Environmental Safety --** All of the selected herbicides are relatively non-toxic to humans and wildlife. Some of the products are labeled for aquatic use so inadvertent occurrence in water is anticipated to have minimal effects on aquatic organisms. Most are labeled for use on grazed areas such as range and pasture. Most are labeled for use in maintaining wildlife habitat, fence rows, as well as rights-of-way. Some products require additional handling precautions by the applicator, but do not pose increased risk to the general public or the environment. For example, eye hazard when using Element 3A is a characteristic of the formulation, not the active ingredient. Further, a more applicator friendly formulation of this product (already available in other states) will be substituted as soon as it has completed registration for use in Washington.

Herbicide Product List

Clallam County proposes to use the following products for targeted herbicide applications:

AquaNeat® (aquatic formulation glyphosate)
Element® 3A (aquatic formulation triclopyr)
Fusilade II® (fluazifop-P)
Milestone® (aquatic formulation aminopyralid)
Polaris® (aquatic formulation imazapyr)
Transline® (clopyralid)
WeeDestroy AM-40® (aquatic formulation 2,4-D).

The chosen products are effective on known roadside weeds, offer the greatest weed selectivity, maximize worker and public safety (no wait, access when the spray has dried), and pose the lowest risk for wildlife and the environment (Table 2). See Appendix B for risk analysis.

The standard, minimum personal protection equipment (PPE) when using herbicides includes:

Long sleeved shirt, long pants
Shoes plus socks
Chemical resistant gloves made of any waterproof materials

(Any additional PPE requirements are shown in Table 2).

Table 2. Selected herbicide characteristics.

Chemical Name Product Name	Selec-tive	Aquatic Sites	Target Weeds	Personal Protection Equipment	Comments
2,4-D WeeDestroy AM-40	✓	✓	Broadleaf	Standard; eye protection + apron for mixing	Inexpensive, often used in mix; short residual
Aminopyralid[1] Milestone	✓	✓	Broadleaf	Standard	Moderate residual may help suppress seed germination; very low rates
Clopyralid Transline	✓		Broadleaf	Standard	Very selective; will not affect many native and desirable plants; long residual; low rates
Fluazifop-P Fusilade II	✓		Grasses	Standard + eye protection	For dry sites; reed canary-grass and annual grasses
Glyphosate AquaNeat		✓	All weeds	Standard	Minimal to no residual; protect desirable vegetation
Imazapyr Polaris		✓	All weeds	Standard	Long residual; protect desirable vegetation
Triclopyr amine Element 3A	✓	✓	Broadleaf, shrubs	Standard plus eye protection	Moderate residual

[1]Registered as a reduced risk pesticide under the EPA reduced risk pesticide program

Adjuvants are compounds added into an herbicide mix to improve efficacy. They perform various functions, including: enhanced plant uptake of the herbicide; better mixing of otherwise incompatible herbicides; increased adhesion of the spray to plant surfaces; and reduced spray drift. In many herbicide products, adjuvants are included as part of the pre-mixed formulation as purchased. Applicators can also add adjuvants to spray mixtures prior to application. Adjuvants include marker dyes, which are visible indicators of freshly treated weeds, include Blazon and Highlite (aquatic formulation).

Surfactants, or “surface active agents", are a type of adjuvant added to a mix to increase the dispersing, spreading, wetting, or other properties of the liquids. Surfactants disperse water droplets and help penetrate a plant’s waxy surface. (Table 3).

Some states require registration of adjuvants as pesticide products, but the US EPA does not, so relatively less is known about adjuvants compared to pesticide active ingredients. Acute toxicity information is often available, with some of these compounds being labeled as strong eye or skin irritants, but information regarding chronic toxicity is sparse. Washington State and European countries require environmental toxicology data on adjuvants.

For many pesticide products containing adjuvants as part of the formulation, the compounds are not explicitly identified on the label or the Safety Data Sheet. Unless they are on one of US EPA’s lists of more toxic chemicals, they do not have to be identified. The identity of these ingredients in a pesticide or adjuvant product is legally protected from full disclosure as “Confidential Business Information.”

Without more detailed information, it is not possible to conduct a comprehensive risk assessment on adjuvants, so they are not included in the risk charts shown as part of Appendix B, which focus on herbicidal active ingredients. However, at least one adjuvant is known to pose hazards to wildlife—the surfactant used in the original formulation of RoundUp®, polyoxyethyleneamine (POEA). This surfactant is more toxic to aquatic life than the active ingredient glyphosate—it has been included as a separate entry in the risk charts. Nonylphenol ethoxylates (NPEs), which are used in some adjuvants (and many consumer products), may be linked to endocrine disrupting effects. No products containing polyethoxylated tallowamine (POEA) or nonylphenol ethoxylates (NPEs) will be allowed for use in this program. Adjuvants with low toxicity to wildlife include modified seed oils, alkyl ethoxylates, and silicones. Liberate®, Competitor®, DyneAmic®, and Agri-Dex® (all aquatic formulations) are brand names of some adjuvants from these low toxicity categories and have been selected for use in this program. Research is developing on this subject and will be regularly added to updates for this program

Government agencies negotiate for favorable pricing and award a contract to a preferred provider for many goods and services. Herbicides will be purchased under state contract whenever possible to conserve tax dollars. Because the preferred provider may vary from year to year; different brand names than listed in the previous tables, with the same active ingredient may be substituted. New products or different formulations with the same active ingredient that are more user or environmental friendly, and cost beneficial will be substituted as they become available.

Table 3. Adjuvants used to enhance herbicide effectiveness.

Adjuvants	Aquatic use	Treatment effects	PPE	Comments
Competitor - vegetable oil Agri-Dex, -crop oil concentrate Dyne-Amic - nonionic surfactant Liberate - fatty acids	✓	Increases herbicide uptake	Standard	Used at low rates
Blazon - marker dye Highlite - marker dye	✓	No active effect	Standard	Highlights recently sprayed weeds; washable

A number of studies have shown non-synthetic products (or “natural”) are considerably less effective for controlling weeds, especially biennials or perennials, than synthetic ones. However, three of these products, acetic acid, clove oil, and limonene are the subject of an on-going study for control of the annual weed, herb Robert. Pending study results in 2016, one or more of these herbicides may be added to the herbicide product list for control of this or other annual weeds.

Application Methods

- **Foliar.** Applications to the plants' leaves are an easy way to control weeds with maximum amount of herbicide directed to the target plants and optimum up take by the plants for both herbaceous forbs and grasses.
- **Wiping Applicators.** Wiping applicators (also called rope wicks) rub the concentrated herbicide solution on the plant's leaf and stem surfaces. Because only the weeds tall enough to contact the rubbing surface are affected, nonselective herbicides can be used selectively to release low-growing plants or plants below the treatment height. Drift does not occur with wiping applicators so there is no potential exposure for adjacent crops and gardens.
- **Stem Injection.** Some species, such as knotweeds, have stems of sufficient size that herbicide can be injected directly into the stem. While this is an effective treatment, it is a very labor intensive treatment for treating dense stands. Only some herbicides are labeled for this application method.
- **Stem Injection/Spaced Cuts/Cut Surface/Cut Stump/Basal Bark.** Stem injection, spaced cuts, cut surface, cut stump, and basal bark are treatments often used for controlling tall growing woody plants. As the name implies, herbicide is applied to just the cut surface or the woody stem. The herbicide rate and carrier is adjusted according to the part of the woody plant being treated. Unlike foliar treatments done during the growing season, these treatments can be applied year round. These treatments are particularly effective for large butterfly bush and Scotch broom in excess of 1-2 inches in diameter.

Record Keeping

Thorough record keeping is maintained on a WSDA approved form (Appendix B), per State requirement for all herbicide applications. The record includes information about the treatment including location, chemical used, weather conditions, and applicator comments. Citizen inquiries pertaining to herbicide applications are recorded and addressed.

LIMITATION

Herbicides should not be used:

- When weather conditions do not permit
- Where landowners have a current "Landowner Will Control" agreement
- Special management areas may have specific control practices or limitations

APPLICATION GUIDELINES/STANDARD OPERATING PROCEDURES

- Use only EPA and WSDA approved herbicides.
- All applications supervised by licensed applicators.
- Observe strict compliance to product labels and to State and local regulations.
- Use personal protective equipment as directed on the herbicide product label.
- Carefully select products, rates, timing of application, and equipment to be used.
- Include marker dye to aid identification of treated areas.
- Follow all applicable notification protocols.
- Follow product label for use and storage.
- Apply only aquatically approved formulations within 50 feet of water.
- Treat only the noxious weed site
- Minimize drift injury by not spraying when wind exceeds 10 mph in direction of sensitive non-target plants.
- Use drift reduction agents or techniques as appropriate.
- Don't spray when drift cannot be controlled.
- Avoid application when rainfall is imminent.
- Conduct mixing and loading operations in an area where a spill would not contaminate an aquatic site or well head.
- Do not rinse spray equipment near bodies of water or sources of potable water.
- Be aware and protective of people, working equipment, sensitive crops and gardens, apiaries, endangered species, water and wells.
- Avoid direct applications to pollinators.
- Secure containers during transportation.
- Contain and clean up spills and request help as needed.
- Keep copy of product labels and SDSs in truck.
- Promptly respond to any public inquiries or direct them to the supervisor.
- Post treated areas and specify the duration of exclusion, if appropriate.
- Provide public educational information on the need for weed treatments.
- Coordinate weed management activities where joint use of a right-of-way exists.

Herbicide Notification Process

General public notice is provided annually in early spring. A Press Release (Appendix C) is provided to the local news media. Public Notice is posted on the County website. Both include general vicinity of areas to be treated, reference to the IRWM plan and how to obtain a copy, and information for entering into an Owner Will Control Agreement with Clallam County. Additionally, up to one week prior to weed treatments along county rights-of-way, an Herbicide Notice (Appendix D) is posted at intersections and at least every two miles of contiguous treatment. Information in the Herbicide Notice includes the names of the herbicides to be used, target weed species, approximate date of application, and the telephone number to contact for further information. Notices that are pre-posted are redated as to the actual date of application.

Staff

The IRWM program will be staffed with a licensed supervisor and two seasonal employees that will be licensed or operate under the direct supervision of the supervisor or licensed Noxious Weed Control Board staff.

Training and Licensing

Washington State Department of Agriculture Pesticide License “Public Operator”
Washington State University IPM Program Certification (Continuing Education)

Equipment

Equipment used: back pack sprayers, hand held-spray bottles and loppers, wicker wipe applicators, EZJect lance and injection guns for selected noxious weeds. A backpack sprayer is a self-contained unit (tank and pump) and is carried on the back of the applicator. The capacity of these sprayers is usually less than 5 gallons. The entire tank may be pressurized or only a small chamber that draws from the main tank. This equipment is useful for selective applications and spot treatments. Backpack sprayers are very adaptable to a wide range of nozzle configurations for treating foliage. The backpack sprayer is the major application device for roadside weed control in Clallam County.

Maintenance

- Regular maintenance and calibration of all spray equipment.
- Early detection of targeted weed infestations and ongoing site evaluations.
- Ongoing training of staff including yearly recertification credits.
- Ongoing improvement and updates of equipment and handling protocols.

PERFORMANCE MEASUREMENTS

- Number of projects completed.
- Area of weeds controlled.
- Public, interdepartmental, and agency weed control requests – number of requests, area of treatment, miles of road.
- Public satisfaction -- number of complaints (the lower the number, the better the performance)
- Survey goals -- area and number of miles inspected.
- Documentation, evaluation, and reporting

OWNER WILL CONTROL AGREEMENT

Property owners will have the option to keep the road right-of-way abutting their property weed free with or without herbicides. To do so, the property owner must enter into an Owner Will Control Agreement with the County and perform weed control as outlined in the Agreement.

When entering into an Owner Will Control agreement, property owners assume the county's responsibility under state laws RCW 17.10 and WAC 16-750 to control noxious weeds, which requires timely and often repeated control efforts during the growing season. The landowner would also assume any additional weed control responsibilities resulting from county policy.

Property owners participating in control agreements may also be interested in assisting with cultural control enhancements consistent with long-term roadside weed control goals. Such opportunities will be pursued as program resources and voluntary participation allow.

A sample Owner Will Control packet is included in Appendix F.

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CULTURAL WEED CONTROL

DESCRIPTION

Techniques that benefit the development and health of desirable, competitive plant communities are considered cultural weed control methods. Cultural methods, along with prevention, are the preferred method of weed control wherever possible. Examples include the use of mulch and soil amendments that improve soil fertility to stimulate growth of desired species or to alter soil pH to discourage undesired plants. Cultural weed control includes the planting or seeding of desirable species. Effective use of cultural methods must be conducted in close coordination with efforts to eliminate existing noxious weed sites.

GENERAL USE CONSIDERATIONS

Cultural control methods encourage natural, self-sustaining, site-appropriate plant communities to develop in the long term. Native plant materials are preferred because once established on appropriate sites they require few additional inputs to thrive and self-perpetuate. In addition to low maintenance, well established native plantings provide many environmental services, such as erosion control, biofiltration, pollinator and animal habitat. Native plantings have the potential to prevent undesirable weeds from becoming established by two mechanisms, competition and allelopathy. Competition is the interaction between plants for site resources such as space, nutrients, moisture, and light. Allelopathy occurs when one plant produces chemicals which inhibit the establishment and growth of others. The composition of plant communities on the roadside is likely to be a result of both mechanisms. Native wildflowers provide forage for pollinators and are aesthetically pleasing, while occupying the site to prevent or retard invasion by undesired noxious weeds.

ROADSIDE APPLICATION

The long term goal of this plan is to programmatically incorporate cultural practices into overall roadside management practices. Possible opportunities include: new construction, shoulders and ditches, locations under “Owner Will Control” agreements, post weed treatment, and other county land such as pits, trails, and parks.

Activities that enhance or create native or self-sustaining plant communities should be applied as broadly as possible. Cultural practices are best applied to disturbed or bare ground or after weed treatments have occurred. Controlling the noxious weeds may release native roadside plants but more active measures may be required. Clallam County has a unique opportunity to partner with Olympic National Park to develop and obtain native seed mixes and plant material through the Matt Albright Native Plant Center.

Activities to improve site conditions such as mulching or adding soil to increase successful desirable plant establishment will be considered as resources and materials are available. Such activities cannot interfere or conflict with the primary use and safety of county rights-of-way.

LIMITATION

- Revegetating activities must be postponed until weed infestation is adequately controlled.

- Plant selection must not conflict with roadside safety and maintenance considerations, public or animal health, and adjacent land use or values.
- Roadsides are a harsh environment for establishing many desirable plant species; amending soil may not be a viable option in many cases.

APPLICATION GUIDELINES

- Use native species wherever possible.
- Blend with adjacent landscaping.
- Choose low growing plants for foreslope that require less mowing
- Utilize weed-free, chipped materials on site to suppress weeds. Weedy brush may only be chipped and left on site if it is in early growth stages, and has no ripe seed.

Staff

WSU Master Gardener Coordinator, volunteers, Weed Crew

Training and Licensing

No licensing required
Native plant identification, biology, and habitat needs
Planting techniques
Use of GPS equipment

Equipment

Handheld GPS, hand tools

MAINTENANCE

Maintain/evaluate sites for first five years
Monitor periodically thereafter

PERFORMANCE MEASUREMENT

- ♦ Cooperative relationships with outside entities developed and maintained
- ♦ Planning documents developed
- ♦ Volunteer participation
- ♦ Area replanted
- ♦ Maintenance costs are reduced over time

PREVENTATIVE WEED CONTROL

DESCRIPTION

Preventative weed control refers to any control method that aims to reduce or prevent weeds from being established. Examples of preventative weed control would be using certified weed free materials such as road and shoulder base rock, gravel, straw, soil, or mulch material for construction and maintenance activities, and making sure equipment is cleaned before moving from one location to another.

GENERAL USE CONSIDERATION

Prevention is, by far, the most environmentally and cost-effective control strategy. In addition to the above mentioned best management practices, prevention includes actively surveying for and eradicating new invaders or small, newly discovered infestations as they are encountered.

ROADSIDE APPLICATION

Prevention is a top priority for this plan. Using certified weed-free materials whenever possible reduces or prevents introducing new weeds, and avoiding soil disturbance helps prevent creating an environment vulnerable to invasion. Road designs that are easier to maintain and incorporate weed prevention features can be very cost effective in the long term. Weed Board staff is available to advise and provide technical assistance to Road Department engineers at all stages in road construction.

Weed Free Materials. Since prevention is the foundation of noxious weed control, prevention should start with certified weed-free seeds, mulches, soil, and gravel. The North American Invasive Species Management Association has certification standards that involve inspection of sources and sites to determine they do not contain seeds or plant parts of invasive weeds. Inspection includes, but is not limited to, surrounding ditches, top soil piles, gravel/sand piles and pits, fence rows, roads, easements, rights-of-way, working areas, storage areas, and a buffer zone surrounding the area. Washington subscribes to these certification standards and Clallam County will apply these standards as widely as possible.

Clean Equipment. An important part of prevention is to not carry noxious weed seeds or plant parts from site to site. Before moving from or to a construction or maintenance project, clean the equipment. Remove hanging debris; wash off mud. Ensure that associated vehicles and crew are similarly inspected. These actions help stop the movement of weeds along the roadside corridor. Clean hand tools, boots and clothing as well.

Avoid Bare Ground. One of the problems of mechanical tools is scalping the soil. Whether it's by a grader, a mower, a bush hog, or a string trimmer, bare ground creates openings for the establishment of invasive weeds. Historically, when roadsides were disturbed, native plants from the soil seed bank or undisturbed adjacent land provided the seed source for the new native plants. In today's world, with human disturbances and inadvertent plant introductions, aggressive invasive plants are ready to occupy the available site. Covering bare ground with weed-free materials or seeding with desirable seed mix as soon as possible will suppress weed germination.

Design Controls. Adding new engineering standards that require less maintenance, such as favorable slope gradient, extending chip-seal edge, and incorporating native plantings in construction planning all help to prevent weed invasion.

EDRR. Eradication is a very realistic objective in the early stage of noxious weed establishment. Detecting new invaders or small weed patches and eliminating them at an early stage prevents costly intervention later. This form of prevention called Early Detection, Rapid Response (EDRR), is a preferred strategy for this program.
Both county employees and the general public can be an important part of the EDRR process. The components of EDRR are: 1) detection reporting, 2) identification confirmation, 3) rapid assessment, 4) program planning, and 5) rapid response. The general public will be encouraged to report suspicious plants, or new weed locations. The Clallam County noxious weed board has the resources to confirm the identity of suspicious weeds.

LIMITATION

- Roadways are exposed to all manner of weed pressure and completely preventing transportation and introduction of invasive plants is not possible.
- Routine maintenance activities will create some amount of bare ground.
- This control measure does not deal with established weed infestations.

APPLICATION GUIDELINES

- Incorporate prevention strategies programmatically into all aspects of planning and executing weed control activities and road maintenance.
- Develop native plant materials so that native seeds of desired plants are readily available.
- Limit activities that create bare ground.
- Where disturbance is expected, plan to revegetate with site appropriate plants. Identify the most favorable conditions for establishment.
- Inspect, evaluate weed invasion risk, and treat appropriately in response to emergency disturbances such as fire and flooding.
- Adopt a monitoring schedule to detect the presence of new invaders along roadsides or weed invasion of new construction.
- Incorporate EDRR strategy

Personnel

WSU Master Gardener Coordinator, volunteers

Training and Licensing

Cooperative training with WSDOT
Annual prevention and weed identification programs conducted by the Weed Board

Equipment

None determined at this time

PERFORMANCE MEASUREMENT

- A higher percentage of weed sites are small.
- Program costs are reduced over time.

2016 WORK PLAN

2016 Work Plan

The focus of this work plan is the control of state-listed noxious weeds and invasive, non-native weeds of special concern on Clallam County rights-of-way. The integral precept of this IRWM plan is that all control techniques are potentially applicable to the solution of the problem.

With more than five hundred miles of county roads there are a variety of weed problems as well as control opportunities. Biological controls will continue to operate on roadsides through releases made elsewhere in the county. Additional releases will be made if new insect controls become available and are compatible with routine maintenance activities such as mowing, which is non-specific to and independent of weed control.

Physical controls will continue to be applied across the road system where effective and as resources allow. Scheduling chain gang weed control activities to be consistent with weed growth life-stage and as part of an overall strategy will greatly increase the efficiencies of using this labor force. Volunteers will be recruited for various projects, especially where adjacent infestations threaten county assets.

Chemical control is an important tool that is needed for specific weed problems. Great care has been taken in choosing which herbicides may be applied, and additional safeguards are included by ensuring only targeted, hand applications are allowed. Herbicide use is limited to specific locations which are listed in this plan based on surveys conducted in 2015.

Most importantly, cultural and preventative controls will be applied programmatically to sustain the progress made by all of the above mentioned control methods. Combined, these management practices will move us towards achieving a low maintenance, naturally stable, plant community.

High priority weed targets are identified and control options for an array of roadside weeds are summarized in the tables below. These are followed by specific tasks necessary to implement the 2016 work plan. Tasks are itemized under separate category headings. While listed separately, the tasks represent the best mix of control options chosen to address specific weed problems. The complete set of tasks is carefully designed to be implemented in tandem, not independently.

Identifying High Priority Weed Targets

Table 4 contains known roadside weeds for Clallam County. The table is arranged to show which weeds are the highest priority for control based on potential economic or environmental impacts and feasibility for control. The list is not comprehensive and will change as conditions change.

"Plant status" indicates one of several categories: a **noxious weed** (a prioritized legal designation including Class A, Class B and Class C weeds where control may be required under state law), a **non-native, invasive** plant capable of causing economic or environmental impacts, but not listed by the state, and **weedy**, so prevalent that it is generally considered naturalized or an aesthetic nuisance. Infestations of invasive, non-native species are more easily eliminated before they become established.

To be most efficient when deciding treatment priorities, where known, weeds are characterized as widespread or rare. The following abbreviations are used in the "status" column in Table 4:

ISSC = **I**nvasive **S**pecies of **S**pecial **C**oncern
NCR = **N**oxious, **C**ontrol **R**equired
NR = **N**oxious**, R**are
NW = **N**oxious, **W**idespread
WR = **W**eedy**, R**are
WW = **W**eedy**, W**idespread

Weeds are assigned to a "category" based on information in the "status" column. Weeds are categorized as follows:

Category 1 weeds are Class A, B designate, and selected B or C noxious weeds, additional noxious weeds and invasive species of special concern that are very limited in distribution, and newly discovered invaders that were previously unknown in the county (EDRR - early detection, rapid response). Category 1 weeds are the *highest priority* for control.

Category 2 weeds are noxious weeds that are widespread, but of particular concern to the general public or an affected public entity. Category 2 weed infestations will be added to the annual work plan in an effort to methodically reduce widespread weeds over time and to accommodate requests.

Category 3 weeds are those that are so widespread they are generally considered naturalized or a nuisance. These weeds are tolerated. Control is not considered feasible.

A list of roadside weeds, life cycle, growth form, category and status are in Appendix G.

Table 4. Known roadside weeds in Clallam County.

Common Name	Category	Status	Threat
alyssum, hoary	1	NCR	Aggressive invader in fields of forage crops; toxic to horses
bindweed, field	1	NR	Seriously interferes with agriculture
brome, ripgut	1	ISSC	Long seed awns cause injury to nose and eyes of grazing animals; known to occur in Clallam County, but not on roadsides; will be treated under EDRR protocol if observed.
butterfly bush	1	NR	Invades natural areas; dense stands crowd out native vegetation in riparian areas and interfere with natural succession
cheatgrass or downy brome	1	ISSC	Depletes soil moisture in early spring; fire hazard in summer; known to occur in Clallam County, but not on roadsides; will be treated under EDRR protocol if observed.
chicory	1	ISSC	Only found in the Dungeness Valley where it is starting to spread
cinquefoil, sulfur	1	NCR	Not readily grazed by livestock and wildlife; forms dense stands
comfrey	1	ISSC	Used medicinally for poultices; liver damage when ingested; can form dense stands; difficult to control once established

Common Name	Category	Status	Threat
fennel, common*	1	NCR	Dense stands exclude native vegetation
hawkweed, orange	1	NCR	Dense stands exclude other species; bitter and unpalatable, little forage for livestock and wildlife
herb Robert	1	N**	Spreads rapidly; displaces native herbaceous plants; allelopathic, inhibits the germination of small seeded forbs in forest understory
hogweed, giant	1	NCR*	Skin contact with sap causes severe dermatitis and blistering on people and animals
knapweed, diffuse	1	NCR*	Spreads seed by tumbling; prickly flower heads; unpalatable after early spring
knapweed, meadow	1	NCR	Outcompetes pasture species; degrades wildlife habitat; interferes with agriculture
knapweed, spotted	1	NCR	Allelopathic plant that can inhibit the germination of grasses; forms dense stands that exclude desired plants and wildlife
knotweed, Bohemian	1	NCR	Easily spreads by disturbance; dense colonies eliminate other plant species and can degrade fish habitat; causes structural damage to human structures
knotweed, giant	1	NCR	Easily spreads by disturbance; dense colonies eliminate other plant species and can degrade fish habitat; causes structural damage to human structures
knotweed, Japanese	1	NCR	Easily spreads by disturbance; dense colonies eliminate other plant species and can degrade fish habitat; causes structural damage to human structures
laurel, spurge	1	NR	Toxic to humans and animals; contact with plants can cause dermatitis
loosestrife, purple	1	NCR*	Dense stands eliminate other plant species; poor palatability; degrades wildlife habitat and hunting and fishing areas.
old man's beard	1	NR	Climbing growth smothers other plants, even trees
poison hemlock	1	NCR	Highly toxic to humans and animals; all parts of the plant are toxic; severe birth defects
ribbon grass	1	NR	Aggressive invader displaces other plants in wet sites; an ornamental form of reed canarygrass; may also be used as a source for psychedelic drugs
tansy ragwort	1	NCR	Poisonous to horses, cattle, and pigs; animals grazing tansy can produce tainted milk, may result in potentially toxic residue in honey
tansy, common	1	NR	Dense stands degrade forage value; toxicity issues for humans and livestock
teasel, common	1	NCR	Forms dense stands of prickly, unpalatable plants; degrades habitat and reduces accessibility
whitetop, hairy	1	NR	Monocultures displace desirable plants; unpalatable; can be toxic to cattle
wormwood, absinth	1	NR	Aggressive invader, will outcompete desirable forbs and grasses in pastures, fields and native grasslands; plants have a strong bitter taste and odor, may affect milk quality
blackberry, evergreen	2	NW	Dense canopies crowd out native species; impenetrable barrier

Common Name	Category	Status	Threat
blackberry, Himalayan	2	NW	Dense canopies crowd out native species; impenetrable barrier
broom, Scotch	2	NW	Forms dense stands; unpalatable; interferes with forest regeneration; fire hazard; scent can exacerbate human grass allergies; seeds are toxic to horses and livestock
burdock, common	2	WR	Forms large rosettes; hooked spines on seeds become entangled in fur of animals
canarygrass, reed	2	NW	Unpalatable unless young, dense stands crowd out native plants; especially difficult to control; serious wetland invader; can stop the process of succession in riparian sites, impedes tree seedling establishment
carrot, wild	2	NW	Damages agricultural commodity as it may cross pollinate with domestic carrot, seriously degrading the quality of commercial carrot seed production
iris, yellow flag	2	NR	Toxic to humans and animals; displaces vegetation at wet margins of ditches, ponds, and lakes; plant resins can cause skin irritation in humans
peavine, everlasting	2	ISSC	Forms dense thickets; can be toxic to livestock; seeds poisonous; seriously interferes with forest regeneration
thistle, bull	2	NW	Aggressive competitor, unpalatable for cattle
thistle, Canada	2	NW	Aggressive competitor, unpalatable; decreases forage; host species for several agricultural pests
bindweed, hedge	3	WW	
buttercup, creeping	3	WW	
catsear, common	3	NW	Crowds out palatable forage species
clover, various	3	WW	
daisy, oxeye	3	NW	Livestock avoid grazing; milk from dairy cows has unpleasant flavor
dandelion, common	3	WW	
horsetail	3	WW	
orchard grass and other pasture grasses	3	WW	
St Johnswort, common	3	NW	Causes photo-sensitization when grazed; toxic at all stages of growth

*No active sites, but previously documented; **Insufficient distribution information

Table 5 shows general guidelines for year-round treatments of the listed noxious weeds and invasive weed species of special concern. It is intended as a basic reference framework from which decisions are made for weed treatments from available options. Seasonal variables are considered and addressed as they become evident. Changes to the Clallam County Noxious Weed List or species that appear on county right-of-way may make adjustments necessary.

Table 5. Recommended control treatments for Clallam County roadside noxious weeds.

Noxious Weed	Fall	Winter	Spring	Summer
Category 1 Weeds				
alyssum, hoary	Foliar herbicide treatment	Manual removal/digging	Manual removal/ digging; foliar herbicide treatment	Foliar herbicide treatment; clip flower heads
bindweed, field	Foliar herbicide treatment	Plants die back - no action	Foliar herbicide treatment	Foliar herbicide treatment
butterfly bush	Herbicide treatment - cut stump or foliar	Manual removal/ digging; mowing; cut stump treatment	Manual removal/ digging; herbicide treatment - cut stump or foliar	Manual removal/ digging; herbicide treatment - cut stump or foliar
canarygrass, reed	Foliar herbicide treatment	Plants die back - no actions	Foliar herbicide treatment	Foliar herbicide treatment
cinquefoil, sulfur	Foliar herbicide treatment	Plants die back - no action	Manual removal/ digging; foliar herbicide treatment	Foliar herbicide treatment
fennel, common	Manual removal/ digging; foliar herbicide treatment for fall regrowth	Manual removal/ digging;	Manual removal/ digging; foliar herbicide treatment	Manual removal/ digging; foliar herbicide treatment
hawkweed, orange	Foliar herbicide treatment	Plants die back - no action	Foliar herbicide treatment	Foliar herbicide treatment
herb Robert	Foliar herbicide treatment	Plants die back - no action	Manual removal; foliar herbicide treatment	Manual removal; foliar herbicide treatment
hogweed, giant	Manual removal/ digging;	Plants die back - no action	Manual removal/ digging; foliar herbicide treatment; clip flower heads	Manual removal/ digging; foliar herbicide treatment
knapweed species	Manual removal/ digging;	Manual removal/ digging;	Foliar herbicide treatment (rosette stage)	foliar herbicide treatment; biological control
knotweed species	Foliar herbicide treatment or injection	Plants die back - no action	Mowing for sight distance issues	Foliar herbicide treatment or injection (late summer)
laurel, spurge	Foliar herbicide treatment	Plants die back - no actions	Foliar herbicide treatments	Foliar herbicide treatments
loosestrife, purple	Manual removal/digging;	Plants die back - no action	Manual removal/digging;	Manual removal/ digging; foliar herbicide treatment; clip flower heads; biological control
old man's beard	Foliar herbicide treatment if prostrate; basal stem treatment	Basal stem treatment	Foliar herbicide treatment if prostrate; basal stem treatment	Foliar herbicide treatment if prostrate; basal stem treatment
poison hemlock	Manual removal/ digging; foliar herbicide treatment for fall regrowth	Manual removal/ digging;	Foliar herbicide treatment (rosette stage)	Manual removal/ digging; foliar herbicide treatment; clip flower heads; biological control
tansy, common	Foliar herbicide treatment	Plants die back - no action	Manual removal/ digging; foliar herbicide treatment	Foliar herbicide treatment

Noxious Weed	Fall	Winter	Spring	Summer
tansy ragwort	Manual removal/ digging; foliar herbicide treatment for fall regrowth	Manual removal/digging	Manual removal/ digging; foliar herbicide treatment (rosette stage)	Manual removal/ digging; foliar herbicide treatment; clip flower heads; biological control
teasel, common	Foliar herbicide treatments	Plants die back - no action	Manual removal/ digging; foliar herbicide treatment	Foliar herbicide treatment
white top, hairy	Foliar herbicide treatments	Plants die back - no action	Foliar herbicide treatments	Foliar herbicide treatments
wormwood, absinth	Mowing for sight distance and seed prevention; herbicide treatment - cut stump, basal bark	Mowing for sight distance; herbicide treatment - cut stump, basal bark	Manual removal/ digging; mowing for sight distance; herbicide treatment - foliar, cut stump, basal bark	Mowing for sight distance; herbicide treatment - foliar, cut stump, basal bark
Category 2 Weeds				
blackberry species	Foliar herbicide treatment; mowing for sight distance issue	Mowing for sight distance issues	Foliar herbicide treatment; mowing for sight distance issue	Foliar herbicide treatment; mowing for sight distance issue
broom, Scotch	Manual removal /digging; mowing for sight distance issues; cut stump treatment	Manual removal/ digging; mowing; cut stump treatment	Manual removal/ digging; cut stump and foliar herbicide treatment	Manual removal/ digging; cut stump and foliar herbicide treatment; clip flower heads; biological control
iris, yellow flag	Foliar herbicide treatment	Plants die back - no action	Foliar herbicide treatment	Foliar herbicide treatment
peavine, everlasting	Foliar herbicide treatments	Plants die back - no action	Foliar herbicide treatments	Foliar herbicide treatments
thistle, bull	Foliar herbicide treatment to rosettes	Plants die back - no action	Manual removal/ digging; foliar herbicide treatment	Manual removal/ digging; foliar herbicide treatment; clip flower heads
thistle, Canada	Foliar herbicide treatment	Plants die back - no action	Foliar herbicide treatment	Foliar herbicide treatment; clip flower heads

TASKS

Biological

- Identify release appropriate sites adjacent to County right-of-way.
- Coordinate with WSU Extension and the Noxious Weed Control Board for releases as they become available.
- Assist with research projects where possible.

Physical

- Create a contact list to be shared between departments.
- Coordinate mowing schedule with weed treatments to avoid incompatible treatments.
- Provide mowers with map of planned weed treatment areas.
- Clearly mark areas, communicate location to field crews.
- Schedule and oversee six weeks of chain gang time for large pulling projects.
- Support volunteer opportunities for weed pulling projects as appropriate.

- Create ***Report It!*** forms so that road crews can report weed infestations.
- Discourage mowing of desirable native vegetation wherever possible.
- Collaborate with mowing personnel to update mowing practices.
- Consult on road standards that maximize mowing effectiveness in regard to weed control.

Cultural

- Identify opportunities to use native plantings in the early stages of projects in the County's transportation plan
- Develop roadside environmental typing system.
- Compile list of plant material sources and needs from other government entities.
- Seek grant opportunities to implement pilot projects.
- Foster partnership with Olympic National Park Matt Albright Plant Material Center to requisition native plant augmentation suitable for roadside needs.
- Compile roadside appropriate list of native or desirable grasses, forbs, and shrubs from a literature search, WSDOT and Federal Highway system, and other entities with large right-of-way management responsibilities.
- Partner with experts from local, state and federal agencies and entities including but not limited to Clallam County Noxious Weed Control Board, Clallam County Parks, Washington State University Extension, WSU Master Gardeners, local chapters of Bee Keepers, the Native Plant and Audubon Societies, The Nature Conservancy, Conservation Districts, Olympic National Park, Olympic National Forest, USFW Marine Refuge System, Makah, Quileute, Lower Elwha Klallam, and Jamestown S'Klallam Tribes, and others who have an interest in developing local native seed and plant resources for use in government projects.
- Encourage landowners with "Owner Will Control" agreements to undertake adjacent roadside enhancements consistent with developing a low maintenance, self-sustaining plant community to prevent weed invasion. Include roadside appropriate list in "Owner Will Control" packet as it becomes available.

Preventative

- Develop rock and gravel source weed management protocols.
- Inventory, develop and implement weed management plans for all county quarries, storage areas, and spoil disposal sites.
- Adopt weed free material requirements for all county projects.
- Develop clean equipment standards and requirements for all county projects.
- Provide inspection services for all privately sourced material for county projects that may be weed-contaminated.
- Compile a list of sources that meet weed-free standards.
- Facilitate annual department weed and native plant identification training in cooperation with Weed Board staff. Supply field crew with identification booklets. Provide plant identification services for field crew in cooperation with Weed Board Staff.

Chemical

- Implement project list based on tables 6 and 7, control requests, and planned reduction of Category 2 weed sites.
- Complete treatment records.
- Enter data into Clallam County Noxious Weed Control Program (CCNWC) database.
- Monitor at least 10% of all treatments, retreat as needed and as resources allow.
- Conduct a weed inventory on at least 25% of all county roads annually.
- Identify, document, and map additional species, location, size, and density.
- Identify and compile a list of high priority infestations for following year. Create map.
- Identify and compile a list of sites for revegetation appropriate opportunities.
- Support four, volunteer-based projects either on or adjoining county property that protect county property from weed infestations. This may include monitoring, road-typing for revegetation, and revegetation projects.
- Compile locations and instructions for special management areas. Include and update field maps as frequently as needed.
- Promptly respond to all public inquiries. Address any public concerns regarding applications.
- Manage "Owner Will Control" agreements.
- Develop on-line self-serve, “Owner Will Control” application process and forms.
- Maintain current list and map of “Owner Will Control” locations for both the office and field use.
- Develop on-line, self serve, weed control request application process and forms.
- Develop on-line, ***Report It!*** process and forms.
- Compile annual report summarizing accomplishments, effectiveness, and recommendations for the subsequent year. Brief the Road Department and County Commissioners by December 31.
- Draft IRWM plan and submit to the Clallam County Noxious Weed Control Board and Road Department Supervisor for approval prior to the Weed Board’s first meeting of the year. At its first meeting, the Weed Board holds a public hearing to approve the annual County Noxious Weed Control List. Submission of the IRWM plan should occur 20 days before the meeting, and should be posted online and made available to the public upon request. Advertise the plan to allow the public to provide feedback. The finalized plan and a map of proposed treatment locations should be posted online and made available to the public upon request.

APPLICATION LOCATIONS

In 2015 Weed Board staff surveyed approximately 50% of county roads using a standard protocol. The work plan addresses treatment locations and proposed herbicide use in very specific details.

Table 6 and Table 7 list the roads proposed for herbicide treatment in the 2016 growing season for east, central, and west Clallam County. Table 6 includes roads which contain the worst infestations of four noxious weeds species, collectively knapweeds and knotweeds, which are required for control under state law (Category 1). These weeds have not been successfully controlled through mowing or other control practices. Adjacent roads, which are just beginning to be infested, may be included as well. A total of 3.4 acres comprised of these four weed species was specifically identified during a recent survey and is included for control in this table. Maps of these roads are presented in Appendix G. Additional category 1 or 2 weeds found on the roads listed in Table 6 or Table 7 may also be treated as time and resources allow. All other roads or locations containing Category 1 or Category 2 weeds will only be considered for inclusion in this year's work plan by request from an affected owner or entity or as an Early Detection Rapid Response (EDRR) to a newly discovered infestation of less than 100 square feet.

Table 6. Roads selected for herbicide treatment in 2016 by county location.

Road	Target Weed	Acres	Total Miles Surveyed	Comments
East Clallam County				
Palo Alto Rd.	Meadow knapweed	0.04	8.3	Burnt Hill is source of meadow knapweed on all vicinity roads. I patch teasel, 43 of tansy
Happy Valley Rd	Meadow knapweed Spotted knapweed	0.97 0.03	5.4	3 patches teasel, I patch of tansy
River Rd	Spotted knapweed Meadow knapweed	0.04 0.57	1.4	2 patches tansy
Johnson Cr. Rd.	Meadow knapweed	0.11	0.75	
Easterly Rd.	Meadow knapweed	0.01	0.25	
W. Washington St.	Spotted knapweed	0.10	1.0	Likely source on vicinity roads. 2 patches of poison hemlock,
Subtotals: 6 roads	**2 weed species**	**1.87**	**17.1**	
Central Clallam County				
Olympic Hot Springs Rd	Meadow knapweed	0.460	3.4	Source of vicinity infestations. I patch herb Robert
Little River Rd.	Meadow knapweed	0.330	3.8	
Black Diamond Rd.	Meadow knapweed	0.015	4.6	1 patch herb Robert
W. Lauridsen Blvd.	Meadow knapweed	0.080	0.9	
W. Edgewood Dr.	Meadow knapweed	0.090	1.7	I patch tansy
Lower Elwha Rd.	Meadow knapweed	0.002	2.4	
Laird Rd.	Meadow knapweed	0.003	0.4	
W. Lyre River Rd.	Meadow knapweed	0.190	1.3	Likely source of vicinity infestation
E Lyre River Rd.	Meadow knapweed	0.040	1.4	3 patches herb Robert
Gossett Rd.	Meadow knapweed	0.004	1.4	
Farrington Rd.	Meadow knapweed	0.006	0.8	3 patches of tansy

Road	Target Weed	Acres	Total Miles Surveyed	Comments
Whiskey Creek Beach Rd.	Meadow knapweed	0.004	0.9	5 patches of tansy
E. Beach Rd.	Meadow knapweed	0.300	0.6	
Fisher Cover Rd.	Meadow knapweed	0.040	0.7	
Sub totals:14 roads	**I weed species**	**1.56**	**24.3**	
West Clallam County				
W Lake Pleasant Rd.	Bohemian/Giant knotweed	0.002	1.00	
Charlie Creek Rd.	Bohemian knotweed	0.002	0.25	
Hoko-Ozette Rd	Bohemian knotweed	0.008	18.00	tansy ragwort, Scotch broom increasing
Sub totals: 3 roads	**2 weed species**	**0.012**	**19.3**	
Totals: 23 roads	**4 weed species**	**3.44 ac**	**60.7 miles**	

In 2015 a group of WSU Master Gardeners (MG) conducted windshield surveys encompassing approximately 26 miles of Old Olympic Highway and selected adjacent roads (Table 7). The purpose of the survey was to establish a baseline distribution of Scotch broom, Canada thistle, and bull thistle. If treatments are approved in this demonstration area, the group pledged to intensely monitor treatment results.

Master Gardener survey protocols differed from the Weed Board's; measuring gross distribution in road segments, not square feet. The MGs kept paper records documenting locations and other information which were later transferred to a GIS layer. Additional species and infestation (square feet) where Weed Board roadside surveys over lapped have been included in Table 7.

- Patch lengths come from MG surveys
- Patch size comes from Weed Board surveys
- 'Number patches' is number of times a patch of each weed species was noted on that road. Appendix H contains all roadside weed locations documented in 2015 surveys.

Table 7. Thistle-Scotch broom demonstration project conducted by Master Gardeners.

Road	Weeds	Patch length (ft)	Patch size ($ft^{2)}$	# Patches	Miles Surveyed
Cameron Road	Canada thistle tansy ragwort	30	45	2 1	1.8
Cays Road	Bohemian knotweed Canada thistle Scotch broom	70 5	90	2 3 6	2.8
Finn Hall Road	bull thistle Canada thistle	751 4,054		8 11	2.5
Gehrke Road	Canada thistle Scotch broom	140 30		2 1	0.9
Gunn Road	Scotch broom			1	0.9
Heuslein Road	bull thistle Canada thistle	70		5 9	1.4

Road	Weeds	Patch length (ft)	Patch size ($ft^{2)}$	# Patches	Miles Surveyed
Kitchen-Dick Road	bull thistle Canada thistle teasel meadow knapweed Scotch broom spotted knapweed	150	298 1 153	2 6 7 1 1 3	3.2
Lewis Road	bull thistle Canada thistle Scotch broom			4 4 1	1.1
Matson Road	bull thistle Canada thistle Scotch broom	10 2108 300		1 6 1	0.5
Old Olympic Highway	bull thistle Canada thistle field bindweed meadow knapweed Scotch broom spotted knapweed	75 50	250 13 5	7 13 1 2 3 2	5.9
Shore Road	bull thistle Canada thistle			1 3	0.9
Spring Road	bull thistle Canada thistle			2 2	0.6
Vautier Road	Canada thistle Scotch broom spotted knapweed	200		2 1 1	0.6
Woodcock Road	bull thistle Canada thistle meadow knapweed poison hemlock Scotch broom	50 130 200	1 1,480	5 14 2 5 4	3.2
Totals: 14 roads	**9 weed species**	**8,318 ft.**	**2,246 ft^2 0.05 acre**	**158 patches**	**26.2 miles**

APPENDICES

Appendix A Chapter _____ Clallam County Code

Appendix B Non target Impacts and Risk Assessment

Appendix C Sample Record keeping forms

Appendix D Sample Press Release and Public Notice

Appendix E Sample Herbicide Notice

Appendix F Sample Owner Will Control Packet-Draft

Appendix G Roadside weed life cycle, growth form, category and status

Appendix H Focus area maps of target roads

Appendix I Known roadside weed locations

Appendix J References

Appendix A Chapter _____ Clallam County Code

Still Under Consideration At This Time

Appendix B Non-Target Impacts and Risk Assessment

Not only must a roadside weed control strategy be effective and efficient, but it must consider potential adverse impacts to non-target plant and animal species and include measures to mitigate those impacts to the greatest extent possible.

Any potential impacts to humans, pets, livestock, wildlife, desirable plants and the environment from noxious weed and invasive plant removal on roadsides are of concern to the project managers. Every control method has benefits and costs. For example the disturbance caused by workers and mowing or excavation equipment which allows weeds to proliferate can be more significant than impacts from herbicides. Hand removal may result in trampling and soil disturbance. Although all control methods pose some level of risk, potential risks associated with herbicide will receive the greatest scrutiny. Best management practices that reduce or mitigate potential herbicide impacts to non-target organisms will be incorporated into all aspects of the work plan.

Important background information regarding the types of animals that may be impacted by noxious weed and invasive plant control in a roadside setting has been synthesized from the California Invasives Species Council (Cal-IPC) 2015 manual titled, *Best Management Practices for Wildland Stewardship: Protecting Wildlife When Using Herbicides for Invasive Plant Management* and presented below. The full document is available at www.cal-ipc.org. Such information is vital to making informed decisions on ways to mitigate or avert potential effects where possible; especially when making control choices in regard to herbicide selection, application methods and timing. Although the Cal-IPC manual's focus is on wildlands, many of the same types of animals may be found living near if not on, county roadsides and should therefore be considered.

Organisms that are endangered or under threat of becoming endangered receive special protection under The Endangered Species Act. An Information for Planning and Conservation (IPaC) Trust Resource report of threatened and endangered plant and animal species found in Clallam County was provided by the US Fish and Wildlife Service. These species are included in Table 8.

Insects

Insects are a diverse class of animals that are part of the food web on which many vertebrate species depend. Butterflies, bees, wasps and even mosquitoes pollinate plants that then provide fruits and seeds for other animals. Flies and beetles eat rotting debris, which helps recycle nutrients in the ecosystem. Aphids and many other soft-bodied insects suck the juices of plants and are themselves a high-protein food for other insects, reptiles, amphibians, birds and mammals.

Most insects are so small and so intimately connected to vegetation that it is difficult to avoid spraying them directly, along with the invasive plants being treated. Honeybees are routinely tested for sensitivity to herbicides and are broadly representative of other insects. While most herbicide active ingredients used in wildland weed management pose very low toxicological risks to invertebrate species, some of the inert ingredients in formulated herbicide products may pose a greater risk. For example, some oil-based emulsifiable concentrate formulations may be harmful to soft-bodied adult or larval insects like aphids or caterpillars. The Taylor's checkerspot butterfly is the only endangered insect listed in Clallam County. No roadside habitat for the Taylor's checkerspot butterfly has been identified.

Reptiles and Amphibians

Lizards, snakes, turtles, frogs, newts and salamanders are frequently residents of areas where invasive plant management is planned. These species can be exposed to herbicides through direct sprays and

spray drift, and through consuming herbicide-contaminated water, prey, or plants. Amphibians may be especially vulnerable, since they spend a portion of their life cycle as aquatic organisms and often only need small puddles or seasonal streams for growth. The inert ingredients in a formulated herbicide product may be as important to evaluate as the active ingredient in terms of the risk they pose to amphibians. No endangered or threatened reptiles or amphibians have been identified in Clallam County.

Fish and Aquatic Invertebrates

Fish and aquatic invertebrates are often more sensitive to herbicides than terrestrial animals because of their physiology or the increased exposure potential that may result from herbicide movement into aquatic sites. Aquatic species can be exposed to herbicides through direct spray, spray drift, spills or surface runoff. Though few commonly-used herbicide active ingredients are highly acutely toxic to aquatic organisms, toxic effects can result from the exposure to other ingredients in formulated products, such as surfactants. With the current suite of herbicides typically used in invasive plant management, bioaccumulation of herbicides in fish tissue is not a problem, since these herbicides are typically metabolized and/or excreted fairly quickly. A number of fish species (salmonids and trout) found in Clallam County are listed as threatened or endangered and many creeks and rivers are the subject of habitat restoration projects intended to help restore these stocks to healthy population levels.

Mammals

Deer, coyotes, mountain lions, wood rats, gophers, and mice are just a few of the mammals that may populate or feed on animals that populate typical roadsides. Pets, such as dogs and cats, with their owners or wandering freely, might be exposed in a more limited manner. Animals may be exposed to herbicides through contaminated food or water, as well as direct sprays, spray drift, and contact with treated vegetation. The toxicity of herbicides to mammals has been better studied than for most other species because they are used as surrogates for human toxicity assessments. Studies on mammals allow for evaluation of a wide variety of parameters, including reproductive, developmental, and neurological effects in exposed populations, as well as effects on blood chemistry, organ weights, and body weight gain or loss.

The most abundant mammals on a typical roadside area are rodents. They are small enough and abundant enough that they may be directly sprayed or exposed to drift during an herbicide application, particularly with ground spray equipment.

Deer and other herbivores may browse on treated vegetation. Once the vegetation is dead, it becomes less attractive to eat; however, in situations where a selective herbicide is used that kills only broadleaf plants or only grass plants, the treated, but unaffected plant species may pose a dietary exposure risk.

Fishers, while not currently listed as an endangered species, have received special management consideration and have been reintroduced into Clallam County in Olympic National Park. No county roadside habitat has been identified.

Birds

Potentially impacted birds include large carnivorous birds like hawks or ospreys, herbivorous species like geese and ducks, small insectivorous birds, and small fruit and seed-eating birds. All of these species can be exposed to herbicides through their food and drinking water. The highest risks are typically for birds eating sprayed vegetation since that is often the target of the application, and the

likelihood of being exposed is higher than for those species eating contaminated prey. In general, the herbicides used to control invasive plants do not pose significant acute toxicity risks to birds when used under typical use scenarios; however, less is known about chronic and reproductive effects. To minimize risk, applications during nesting season should be avoided if possible. Several federally listed bird species are found in Clallam County, but there are no habitat listings for county right-of-way.

Plants

All types of plants may be affected by weed control activities. Because herbicides are designed to kill plants, an applicator's ability to distinguish desirable plants from weeds is critical. Certain native plant species are protected under state or federal laws. The most current data set (as a GIS shapefile) was obtained from the Natural Heritage Program which is managed by the Washington State Department of Natural Resources. It contained general locational information of rare, threatened and endangered plant species. It was reviewed for species and sites that warrant special management consideration on Clallam County roadsides. Pink fawn lily, which is noted as sensitive (a non regulatory status) was found in the vicinity of six county roadsides. No noxious weed infestations have yet been documented in close proximity to these pink fawn lily sites, but all shall be noted and continue to be under special consideration. Whitebark pine which is a candidate for federal listing is known to exist in Clallam County, but no sites have been identified on county right of way. No rare, endangered or threatened species were identified on county roadsides in the DNR Natural Heritage Program dataset.

Table 8. Species in Clallam County with potential for special management consideration

Common Name	Populations Present /Habitat	Population Identified on County Roadside?	Listing Status
PLANT			
Pink fawn lily	Yes	In vicinity of Walgren Rd, Grant Rd,Pavel Rd, River Breeze Wy, W. Lake Pleasant Rd, Hoko-Ozette Rd.	State-Sensitive, (non regulatory)
Whitebark pine	Yes	none	Fed Candidate
BIRD			
Streaked Horned Lark	Yes	none	Fed-Threatened
Marbled murrelet	Yes/plus habitat overlap	none	Fed-Threatened
Northern spotted owl	Yes/plus habitat overlap	none	Fed-Threatened
Short-tailed Albatross	Yes	none	Fed-Endangered
Yellow-billed Cuckoo	Yes	none	Fed-Threatened
FISH			
Bull Trout	Yes/plus habitat overlap	Indirect	Fed-Threatened
Dolly Vardon	Yes	Indirect	Fed-Threatened
INSECT			
Taylor's checkerspot butterfly	Yes-FS, private, ONP, DNR/ plus habitat overlap	None-possible potential habitat?	Fed-Endangered
MAMMAL			
Fisher	Yes, reintroduced in ONP	None	Fed-Threatened
HABITAT OVERLAP ONLY			
Chinook	Habitat designation	Indirect	Threatened
Chum	Habitat designation	Indirect	
Sockeye	Habitat designation	Indirect	
Killer whale	Habitat designation	Indirect	

Risk Charts

The herbicide risk charts, tables, and text that follow have been reproduced with permission from the publication: Cal-IPC. 2015 *Best Management Practices for Wildland Stewardship: Protecting Wildlife When Using Herbicides for Invasive Plant Management.* Cal-IPC Publication 2015-1. California Invasive Plant Council, Berkeley, CA. The charts include the most common herbicides used by wildland managers for invasive plant management and include those chosen for use on Clallam County roadsides (see Table 2). Fluazifop, which would be allowed for use under this plan, was not included in the Cal-IPC risk charts because the data needed to conduct the analysis was not available at the time the risk charts were completed.

Wildlife

The risk charts provide information on the comparative risk of each herbicide to each type of wildlife from selected exposure scenarios. A summary of the methods used to generate these charts follows, and refers the reader to the primary sources for more detail. Each chart summarizes potential risk for a specific exposure scenario and is based on a risk assessment model developed by the USFS. See the spreadsheet of calculations on the PRI website for detailed information on risk charts. Using the spreadsheet, you can modify application rates to assess changes in risk profiles. It is important to note that many of the scenarios are “worst case” and do not represent typical real-world situations. The assumptions for each scenario, with a description about how they relate to typical real-world situations are listed on the risk charts.

Risks that fall outside an acceptable zone should prompt the land manager to consider steps to mitigate the risk.

Risk to Wildlife Depends on Both Toxicity and Exposure

Risks to wildlife are dependent on the herbicide’s toxicity to that particular taxonomic group and the animal’s exposure to the herbicide. Toxicity is described using Toxicity Reference Values (TRVs), which represent the dose of herbicide generally assumed to be without adverse effects. Lower TRVs indicate a more toxic herbicide for the particular taxonomic group. The TRVs used to develop the risk charts for the different wildlife taxa are summarized in below.

An important determinant of exposure is the herbicide application rate. For the risk charts, the application rates were set to half of the maximum application rate as indicated on the herbicide’s product label. This “half- max” application rate was used to better approximate typical wildland herbicide applications. For example, invasive plant management typically involves portions of acres to be spot treated, but not entire acres. Alternatively, entire acres might be treated via broadcast spray, but at rates below maximum allowable rates. Since application rate is directly proportional to risk, the risk values at maximum application rates would simply be twice the values shown in the charts (likewise, lower rates would have proportionally less risk)—with the exception of spills, where application rate is not relevant. Table 9 provides the application rates used to estimate exposure for each herbicide in terms of pounds of the active ingredient (or the acid equivalent of the active ingredient) and the equivalent rate per acre for the formulated product.

While hazard assessment for most chemicals typically involves investigating the relationship between increasing exposure and increasing observed adverse effects in laboratory studies, some chemicals may have the potential to cause impacts at very low doses.
Examples of this are the endocrine disrupting chemicals (EDCs), which can interfere with an animal's endocrine (hormone) system, potentially at very low exposure levels. Certain chemicals such as the plasticizers found in plastic bottles are suspected to be EDCs. At the present time, there is no evidence that any of the herbicide active ingredients used in invasive weed control are EDCs. The US EPA studied glyphosate and 2,4-D through their Endocrine Disruptor Screening Program and determined that no convincing evidence exists that either substance disrupts estrogen, androgen, or thyroid pathways. Studies have not been conducted for the other herbicides discussed in this manual, but none are on the European Union list of suspected endocrine disruptors.

Hazard Quotients Defined

The Hazard Quotient (HQ) is a measure of risk and is defined as the ratio of the predicted exposure to a Toxicity Reference Value (TRV) for the particular type of wildlife being assessed. HQ values >1 indicate that exposure exceeds the "No Effect" level, and wildlife may be at risk of adverse effects. For these exposure scenarios, action should be taken by the land manager to reduce exposure.

Table 9: Half-Maximum Application Rates Used in Risk Charts

Herbicide Active Ingredient	Half-Max Application Rate (lbs AE or AI per acre)	Half-Max Application Rate (rate per acre)
Aminopyralid	0.055	3.5 oz of Milestone®/acre
Chlorsulfuron	0.061	1.5 oz of Telar®/acre
Clopyralid	0.125	0.335 pints Transline®/acre
Glyphosate	4.0	3.5 quarts RoundupProMax®/acre (with surfactant) 4 quarts Aquamaster®/acre (no surfactant)
Imazapyr	0.75	3 pts Habitat®/acre
Triclopyr BEE	4.0	4 quarts Garlon 4®/acre
Triclopyr TEA	4.5	1.5 gals Garlon 3®/acre
2,4-D	2.0	4 pts Weedar®/acre

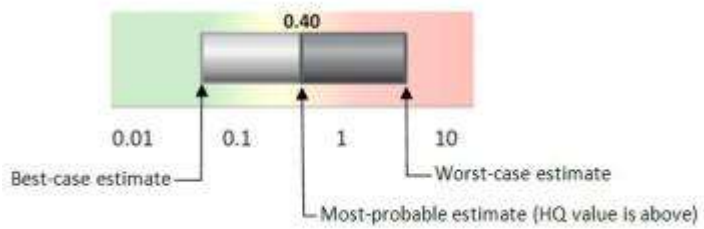
AE = Acid Equivalent; AI = Active Ingredient.

**Fluazifop (Fusilade®) is the one widely-used active ingredient not included in the risk charts because USFS risk analysis was completed after the risk charts were developed*

How to Read the Risk Charts

In the risk charts that follow, risk is expressed as a Hazard Quotient (HQ), which is the ratio of the predicted exposure to a Toxicity Reference Value (TRV), a level of exposure that is anticipated to be without adverse effects.

Each bar on the chart shows a range of estimated risk for a specific exposure scenario based on three estimates of exposure—best-case (low exposure), most-probable (the most likely exposure), and worst-case (high exposure). Each estimate is based on a set of assumptions, such as the amount of herbicide residue on food (such as foliage, fruits, and insects) and the amount of food eaten or the amount of runoff into a water body. Factors used to estimate exposure specific to each scenario are listed in the caption for each chart.



The **best-case risk estimate** is at the left end of each bar and assumes the lowest exposure. The **most-probable risk estimate** (HQ=0.40 in the example above) is located at the point at which the bar changes color from light gray to dark gray, and assumes the most likely exposure. The **worst-case risk estimate** is at the right end of the bar and assumes worst-case exposures.

The background of each risk chart is color-coded, with a HQ in the green zone indicating low risk, an HQ in the yellow zone indicating that anticipated exposures are approaching a level of concern, and an HQ in the red zone indicating that the predicted exposure will exceed the TRV, and adverse effects may result. Because wildlife TRVs are derived from No Observable Adverse Effect Levels (NOAELs), a bar in the red zone does not necessarily mean that harm will occur, but risks that fall in this zone should prompt the land manager to consider steps to mitigate the risk. The further the bar is into the red zone, the more likely it is that adverse effects will occur. The BMPs in Section 3 describe steps that can be taken to reduce risks when HQ values risk calculations exceed a level of concern.

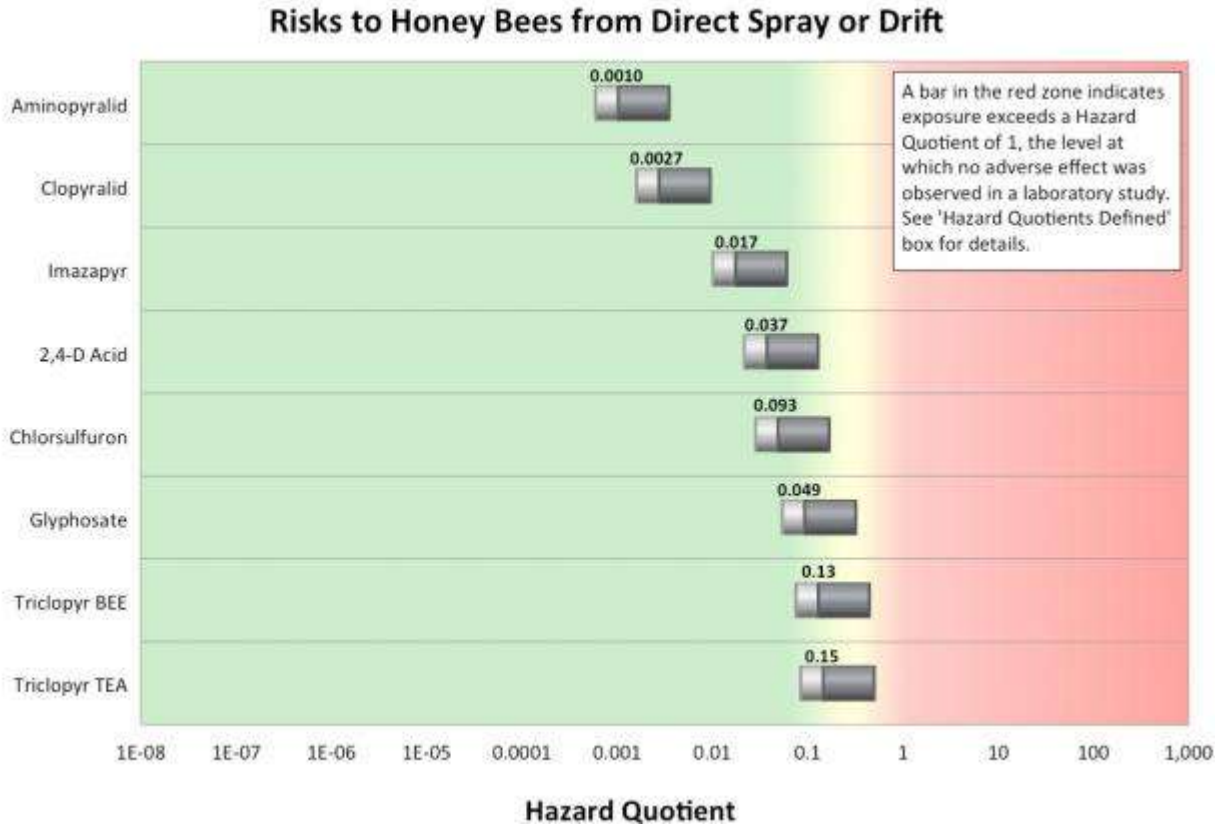
The scale of the charts is logarithmic, which allows for the display of values that differ by many factors of ten. The logarithmic scale also visually compresses the bars and skews plots slightly to the right—for example, a HQ value of 0.5 is not exactly in the middle between 0.1 and 1, but slightly to the right of the halfway point.

Overview of Risks to Wildlife from Use of Common Herbicides

Overall, the risk estimates shown in the charts demonstrate that for the majority of the most-probable acute exposure scenarios, the herbicides pose low risks to wildlife. An exception to this involves fish and aquatic invertebrates exposed to glyphosate formulations that contain certain higher-toxicity surfactants such as polyethyleneamine (POEA). These products cannot be legally applied directly to water, and applicators should also use caution when making applications near aquatic sites, such as ephemeral pools that may be used as breeding areas for amphibians and insects. Using glyphosate products that do not contain POEA in these settings can reduce the potential for impacts.

A second example of risks that may exceed the level of concern under the most-probable exposure scenarios involves products that contain either triclopyr BEE or triclopyr TEA. In these cases, the HQ values can exceed the level of concern for chronic exposure scenarios when large, herbivorous mammals consume vegetation that contains residues of these herbicides.

With regard to the worst-case (highest) exposure level scenarios, 2,4-D acid, glyphosate/surfactant combinations and triclopyr BEE and TEA can all pose risks that exceed the level of concern. These scenarios include both acute and chronic exposures for aquatic invertebrates, fish, mammals and birds.



Taxa: Adult stage honey bees are used as a surrogate for all terrestrial insects.

Assumptions: Terrestrial application of herbicide at half of the maximum rate on a representative product's label (see Table 9); 50% of the bee's body surface is covered with herbicide; 100% of herbicide is absorbed; the distance between the bee and the sprayer is 0-10 feet.

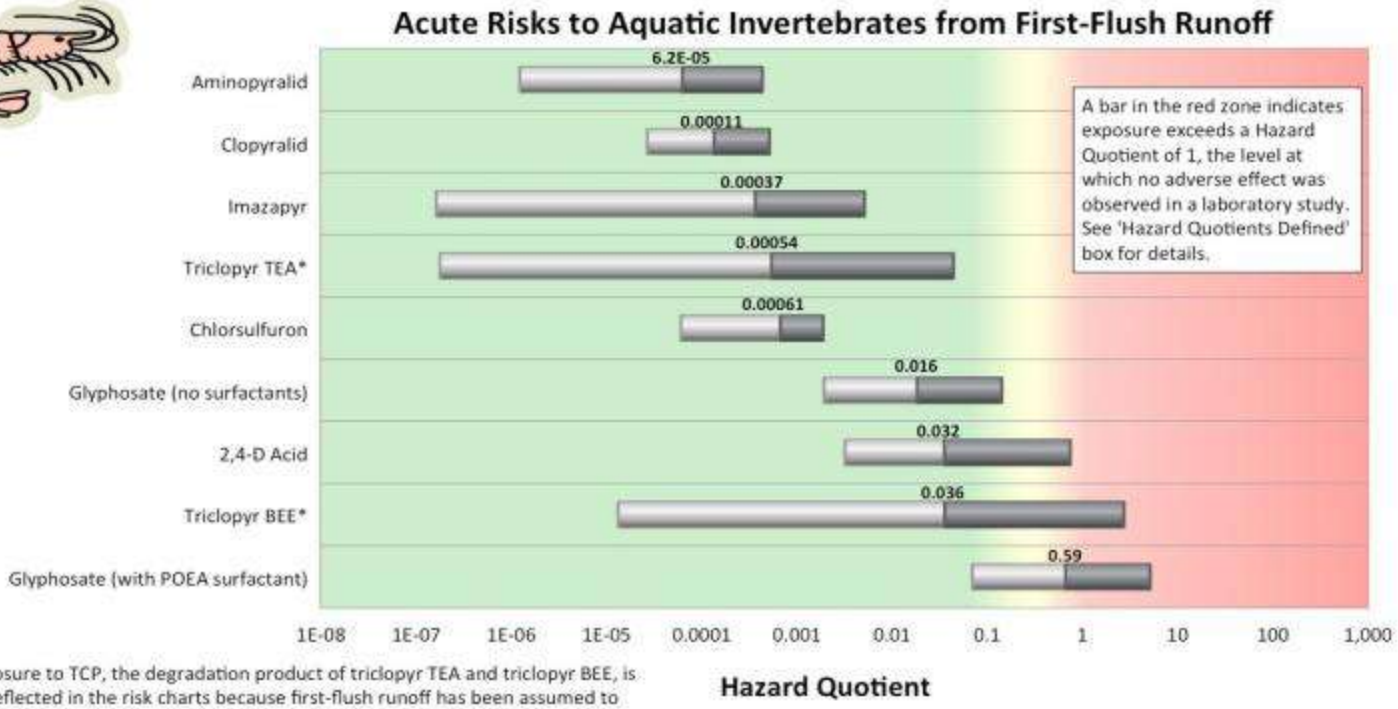
Likelihood: Most likely with spray-to-wet applications on blooming plants or those with extrafloral nectaries.

Mitigation: Do not apply to blooming plants. Apply early in the morning or close to sunset when insects are less active. Use low-volume applications and reduce the amount applied per acre.

Risk calculated as a function of: The inherent toxicity of the herbicide to honey bees; the amount of active ingredient sprayed; and the distance between bee and applicator. Risks in this chart do not account for potential toxicity of any surfactants that are part of the product formulation or added to spray mixtures.

Methodology and sources: See description following risk charts and PRI website, where you can access a spreadsheet for adjusting application rates and other variables.

Reading the chart: For each bar, the labeled central value is the most likely estimate. The right end of the bar assumes worst-case conditions for all underlying variables; the left end of the bar assumes best-case conditions. Mitigation is advised if risk enters the red zone.



*Exposure to TCP, the degradation product of triclopyr TEA and triclopyr BEE, is not reflected in the risk charts because first-flush runoff has been assumed to occur soon after application, before significant amounts of TCP have formed.

Taxa: Aquatic invertebrates.

Assumptions: Terrestrial application of herbicide at half of the maximum rate on a representative product's label (see Table 9); 10-acre treatment with no buffer zone between treatment area and water body.

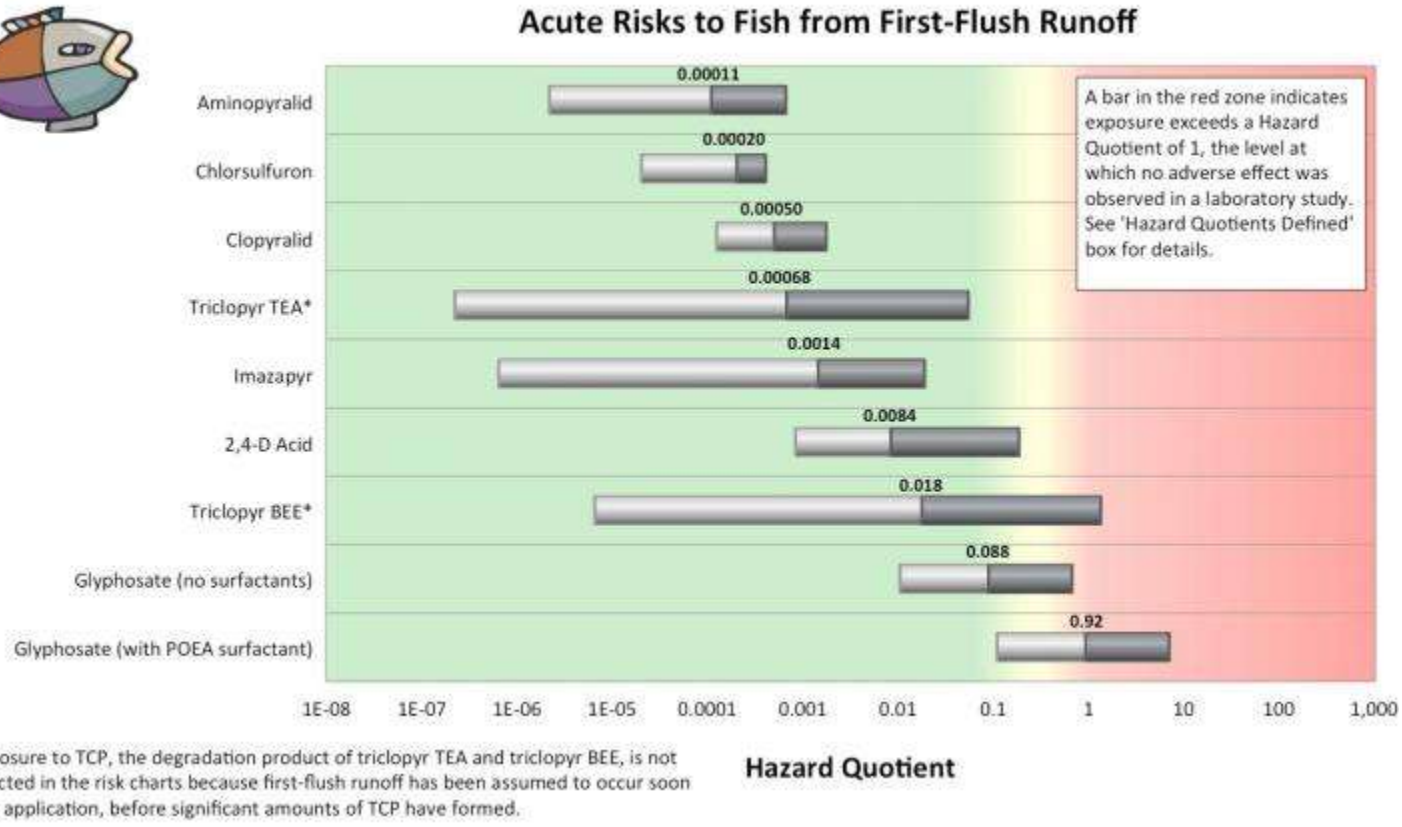
Likelihood: Buffer zones may be required on some water ways and are common practice when using herbicides not approved for aquatic use. Dry season applications can result in long intervals before a rain event, resulting in lower residues for runoff.

Mitigation: Use low-volume applications and reduce the amount applied per acre. Use buffer zones (see Bakke (2001) to help gauge effective buffer distances). Make applications during the dry season to avoid runoff. For applications near waterways, consider using herbicide formulations intended for use in aquatic systems.

Risk calculated as a function of: The inherent acute toxicity of the herbicide to aquatic invertebrates; herbicide characteristics that affect transport through soil to water (water solubility, ability to adsorb to soil); soil type; and the application rate. Herbicide degradation is not considered, as the estimate is for runoff occurring soon after the application. Except for glyphosate with the POEA surfactant, risks in this chart do not account for potential toxicity of any surfactants that are part of the product formulation or added to spray mixtures.

Methodology and sources: See description following risk charts and PRI website where you can access a spreadsheet for adjusting application rates and other variables.

Reading the chart: For each bar, the labeled central value is the most likely estimate. The right end of the bar assumes worst-case conditions for all underlying variables; the left end of the bar assumes best-case conditions. Mitigation is advised if risk enters the red zone.



*Exposure to TCP, the degradation product of triclopyr TEA and triclopyr BEE, is not reflected in the risk charts because first-flush runoff has been assumed to occur soon after application, before significant amounts of TCP have formed.

Taxa: Fish are also used as a surrogate for amphibians.

Assumptions: Terrestrial application of herbicide at half of the maximum rate on a representative product's label (see Table 9); 10-acre treatment with no buffer zone between treatment area and water body; rain within 24 hours of application.

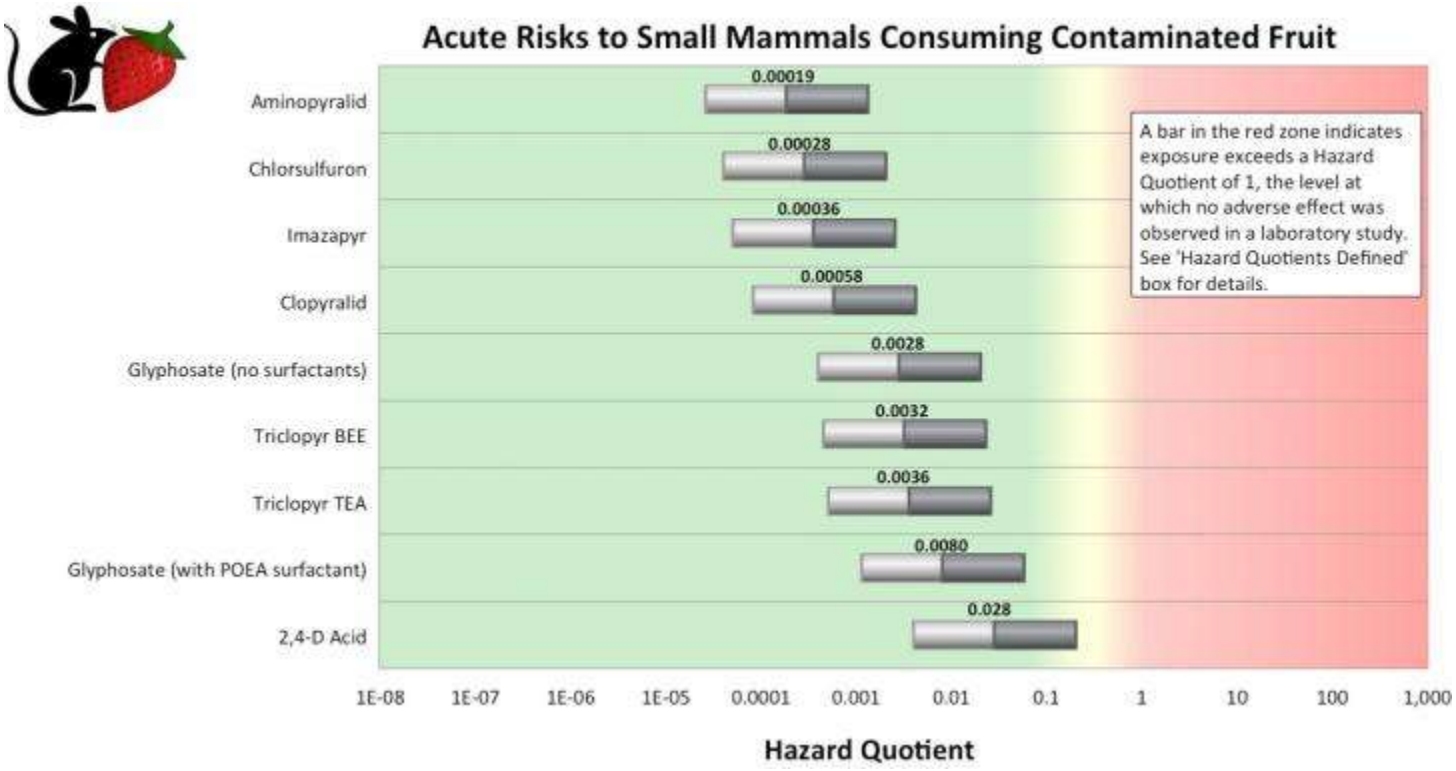
Likelihood: Buffer zones may be required on many water ways and are common practice when using herbicides not approved for aquatic use. Dry season applications in California will result in a long interval before a rain event, resulting in lower residues for runoff.

Mitigation: Use low-volume applications and reduce the amount applied per acre. Use buffer zones (see Bakke (2001) to help gauge effective buffer distances). Make applications during the dry season to avoid runoff. For applications near waterways, consider using herbicide formulations intended for use in aquatic systems.

Risk calculated as a function of: The inherent acute toxicity of the herbicide to fish; herbicide characteristics that affect transport through soil to water (water solubility, ability to adsorb to soil); soil type; and the application rate. Herbicide degradation is not considered, as the estimate is for runoff occurring soon after the application. Except for glyphosate with the POEA surfactant, risks in this chart do not account for potential toxicity of any surfactants that are part of the product formulation or added to spray mixtures.

Methodology and sources: See description following risk charts and go to PRI website where you can access a spreadsheet for adjusting application rates and other variables.

Reading the chart: For each bar, the labeled central value is the most likely estimate. The right end of the bar assumes worst-case conditions for all underlying variables; the left end of the bar assumes best-case conditions. Mitigation is advised if risk enters the red zone.



Taxa: Small mammals.

Assumptions: Terrestrial application of herbicide at half of the maximum rate on a representative product's label (see Table 9); 10-100% of diet is contaminated.

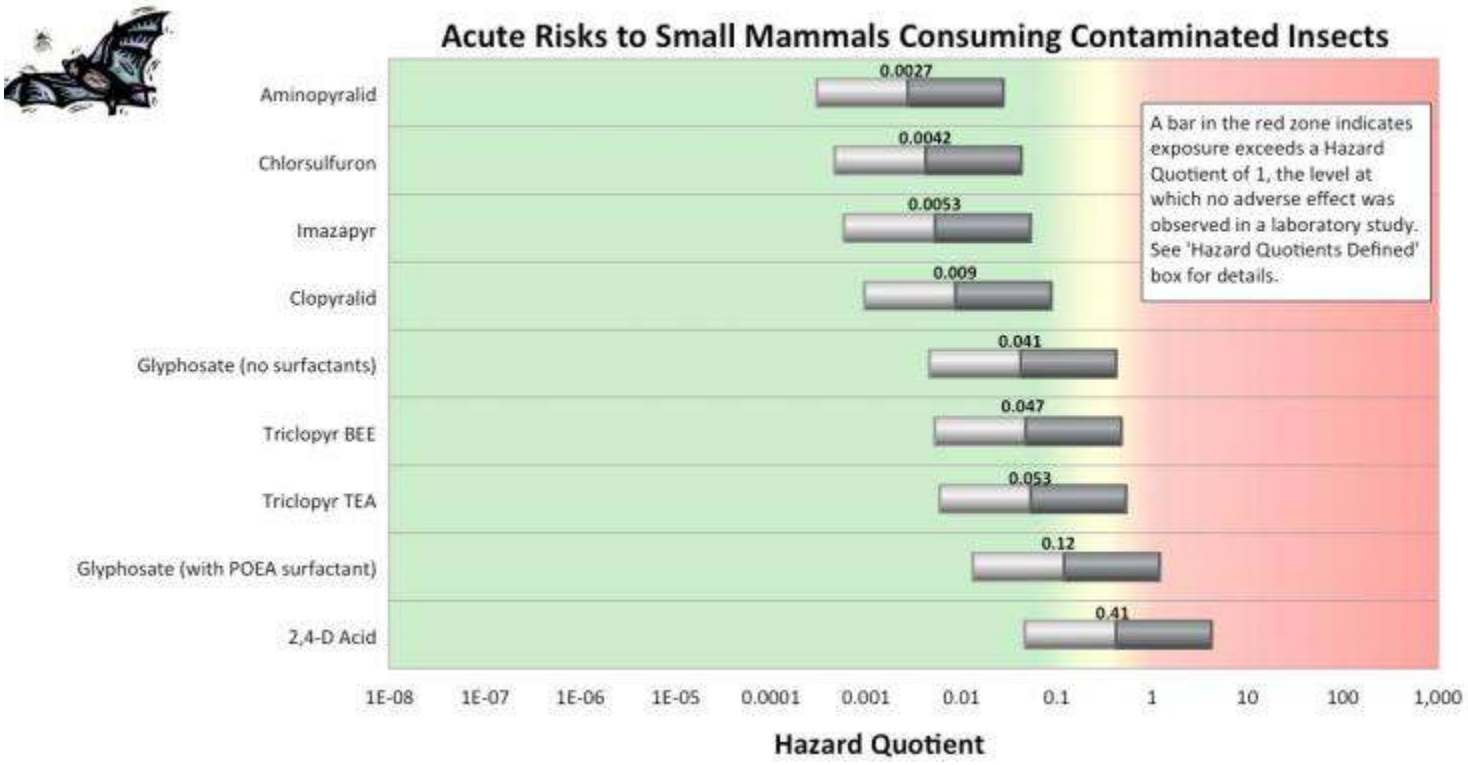
Likelihood: Under spot applications it is possible that a significant portion of a small mammal's diet could be contaminated. With broadcast applications over any sizable area (unusual for wildland management) contamination is likely for some small mammals.

Mitigation: Use low-volume application and reduce the amount applied per acre. If possible, don't treat large contiguous areas all at once. Avoid contamination of plants used as food sources by small mammals.

Risk calculated as a function of: The inherent acute toxicity of the herbicide to mammals; the residue rate of herbicide on fruit (which is proportional to the application rate). Except for glyphosate with the POEA surfactant, risks in this chart do not account for potential toxicity of any surfactants that are part of the product formulation or added to spray mixtures.

Methodology and sources: See description following risk charts and go to PRI website, where you can access a spreadsheet for adjusting application rates and other variables.

Reading the chart: For each bar, the labeled central value is the most likely estimate. The right end of the bar assumes worst-case conditions for all underlying variables; the left end of the bar assumes best-case conditions. Mitigation is advised if risk enters the red zone.



Taxa: Small mammals.

Assumptions: Terrestrial application of herbicide at half of the maximum rate on a representative product's label (see Table 9); 10-100% of diet is contaminated.

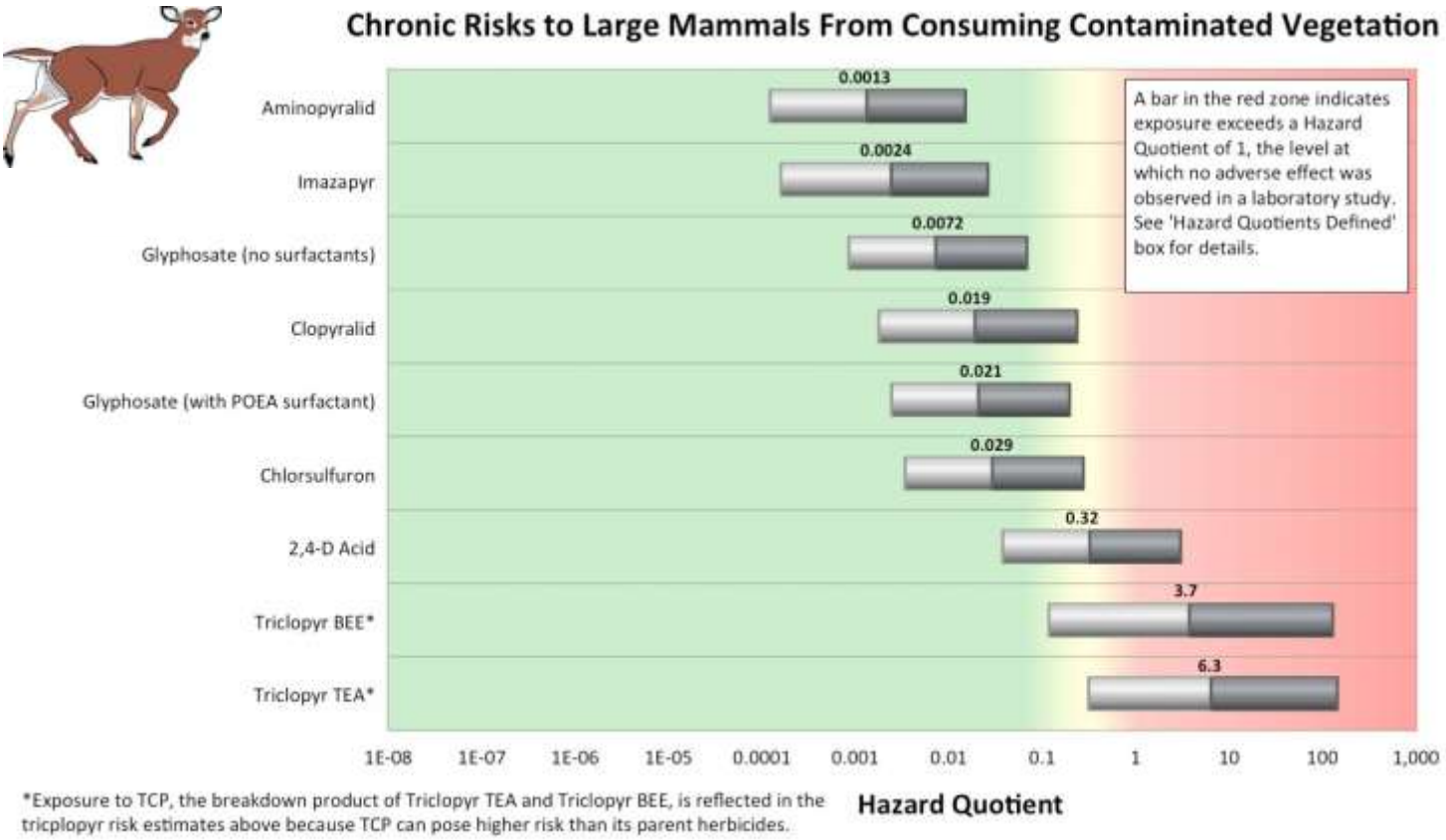
Likelihood: Under spot applications it is unlikely that a significant portion of a small mammal's insect-based diet could be contaminated. With broadcast applications over any sizable area (unusual for wildland management) contamination is possible for some small mammals.

Mitigation: Use low-volume applications and reduce the amount applied per acre. If possible, don't treat large contiguous areas all at once. Avoid treating plants when feeding by insects is likely, if known.

Risk calculated as a function of: The inherent acute toxicity of the herbicide to mammals; the residue rate of herbicide on insects (which is proportional to the application rate). Except for glyphosate with the POEA surfactant, risks in this chart do not account for potential toxicity of any surfactants that are part of the product formulation or added to spray mixtures.

Methodology and sources: See description following risk charts and go to PRI website, where you can access a spreadsheet for adjusting application rates and other variables.

Reading the chart: For each bar, the labeled central value is the most likely estimate. The right end of the bar assumes worst-case conditions for all underlying variables; the left end of the bar assumes best-case conditions. Mitigation is advised if risk enters the red zone.



Taxa: Large mammals.

Assumptions: Terrestrial application of herbicide at half of the maximum rate on a representative product's label (see Table 9); 10-100% of diet is contaminated for several months.

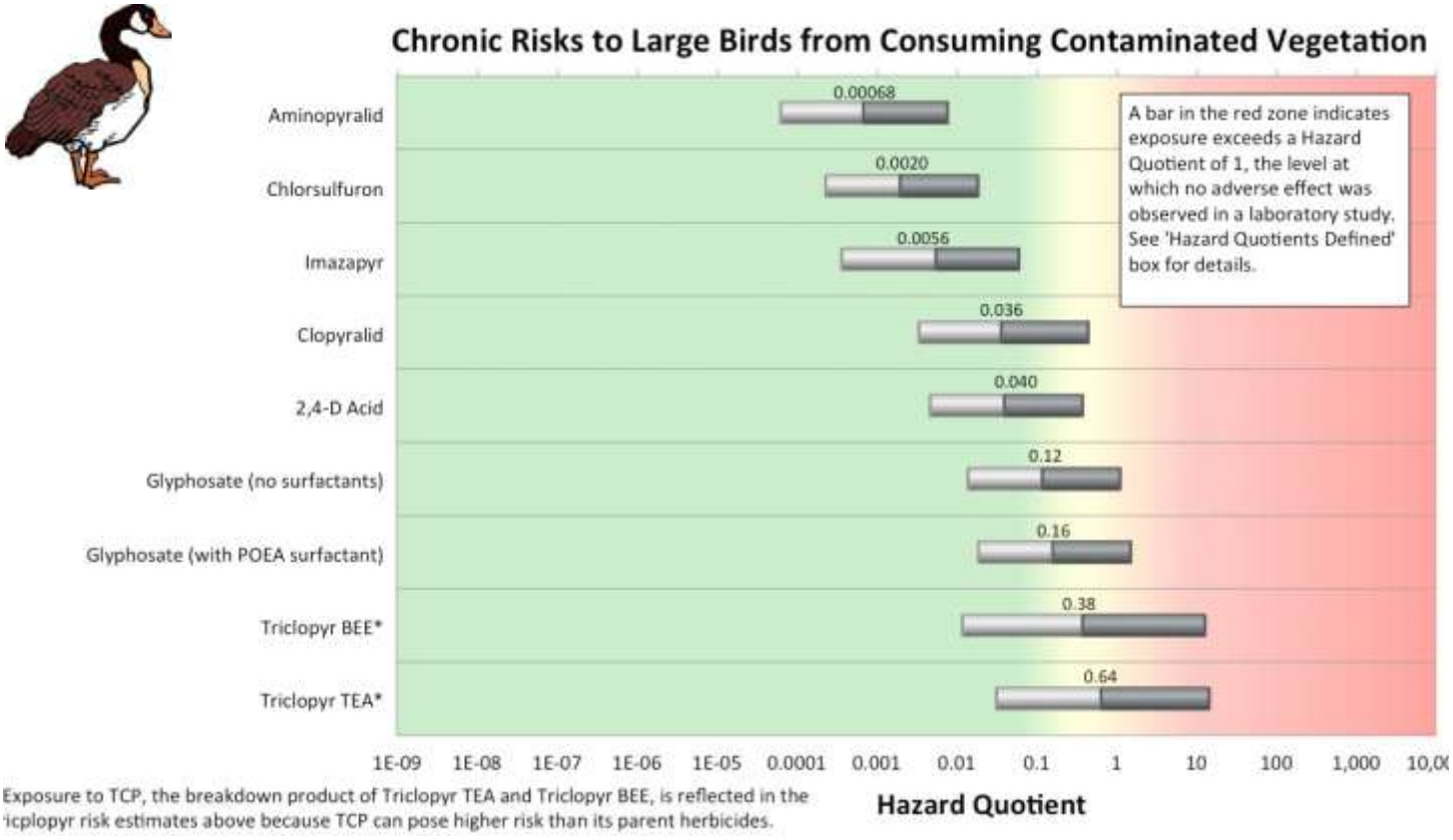
Likelihood: Under spot applications it is unlikely that a significant portion of any large mammal's diet would be contaminated. With broadcast applications over any sizable area (unusual for wildland management) consider the feeding range of the wildlife relative to the treatment area.

Mitigation: Use low-volume applications and reduce the amount applied per acre. If possible, don't treat large contiguous areas all at once. Avoid contamination of plants known to be used as food sources by large mammals.

Risk calculated as a function of: The inherent chronic toxicity of the herbicide to mammals; the residue rate of herbicide on vegetation (proportional to the application rate). Except for glyphosate with the POEA surfactant, risks in this chart do not account for potential toxicity of any surfactants that are part of the product formulation or added to spray mixtures.

Methodology and sources: See description following risk charts and go to PRI website, where you can access a spreadsheet for adjusting application rates and other variables.

Reading the chart: For each bar, the labeled central value is the most likely estimate. The right end of the bar assumes worst-case conditions for all underlying variables; the left end of the bar assumes best-case conditions. Mitigation is advised if risk enters the red zone.



Taxa: Large birds.

Assumptions: Terrestrial application of herbicide at half of the maximum rate on a representative product's label (see Table 9); 10-100% of diet is contaminated for several months.

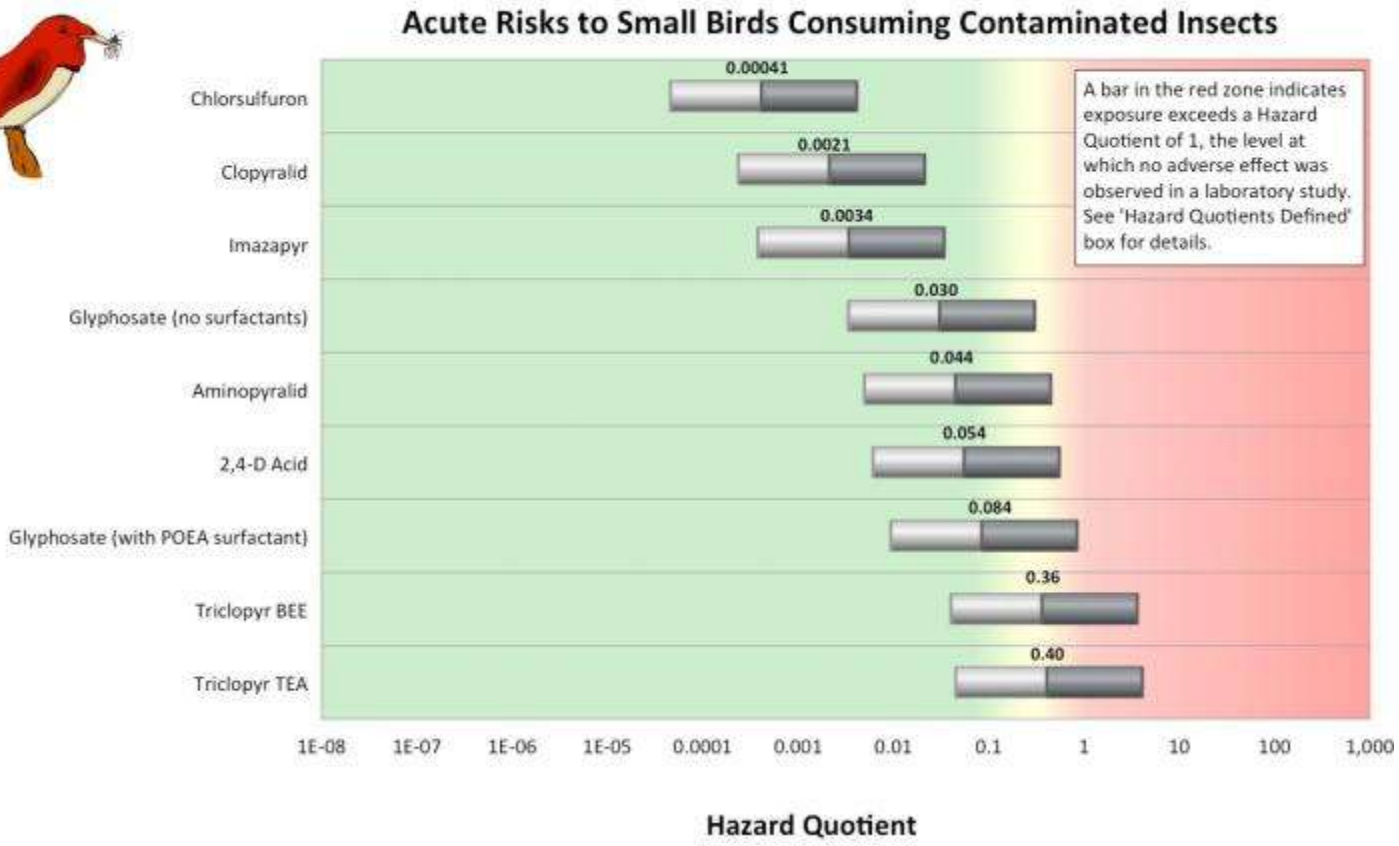
Likelihood: Under spot applications it is unlikely that a high portion of any bird's diet would be contaminated. With broadcast applications over any sizable area (unusual for wildland management) consider the feeding range of the wildlife relative to the treatment area.

Mitigation: Use low-volume applications and reduce the amount applied per acre. If possible, don't treat large contiguous areas all at once. Avoid contamination of plants known to be used as food sources by birds. Avoid treatments during nesting season.

Risk calculated as a function of: The inherent chronic toxicity of the herbicide to birds; the residue rate of herbicide on vegetation (which is proportional to the application rate). Except for glyphosate with the POEA surfactant, risks in this chart do not account for potential toxicity of any surfactants that are part of the product formulation or added to spray mixtures.

Methodology and sources: See description following risk charts and go to PRI website, where where you can access a spreadsheet for adjusting application rates and other variables.

Reading the chart: For each bar, the labeled central value is the most likely estimate. The right end of the bar assumes worst-case conditions for all underlying variables; the left end of the bar assumes best-case conditions. Mitigation is advised if risk enters the red zone.



Taxa: Small birds.

Assumptions: Terrestrial application of herbicide at half of the maximum rate on a representative product's label (see Table 9); 10-100% of diet is contaminated.

Likelihood: Under spot applications it is unlikely that a high portion of any bird's insect-based diet would be contaminated. With broadcast applications over any sizable area (unusual for wildland management) consider the feeding range of the wildlife relative to the treatment area.

Mitigation: Use low-volume applications and reduce the amount applied per acre. If possible, don't treat large contiguous areas all at once. Avoid treating plants when insects are feeding. Avoid treatments during nesting season.

Risk calculated as a function of: The inherent acute toxicity of the herbicide to birds; the residue rate of herbicide on insects (which is proportional to the application rate). Except for glyphosate with the POEA surfactant, risks in this chart do not account for potential toxicity of any surfactants that are part of the product formulation or added to spray mixtures.

Methodology and sources: See description following risk charts and go to PRI website, where you can access a spreadsheet for adjusting application rates and other variables.

Reading the chart: For each bar, the labeled central value is the most likely estimate. The right end of the bar assumes worst-case conditions for all underlying variables; the left end of the bar assumes best-case conditions. Mitigation is advised if risk enters the red zone.

The methods used for estimating risk are based closely on USFS risk assessment methodology (link), in which three estimates are calculated for the exposure (dose) received as a result of various herbicide use scenarios. Each dose estimate is based on a set of best-case, most-probable, or worst-case assumptions based on exposure parameters appropriate to that scenario. The dose estimates are then compared to Toxicity Reference Values to assess risk if the scenario were to occur.

Exposure estimates were calculated using the risk assessment spreadsheets developed by Syracuse Environmental Research Associates (SERA) for the USFS and the Bureau of Land Management (BLM), published between 2007 and 2014. A full description is available in the report "Preparation of Environmental Documentation and Risk Assessments." Risk assessments for each of the herbicides discussed here are also downloadable from the USFS site. A detailed explanation of the methods used to estimate risk in this report is also available in Chapter 2 of the "2010 Marin Municipal Wastewater District (MMWD) Herbicide Risk Assessment." However, some parameter values and methods used for the risk estimates above differ from the *2010 MMWD Herbicide Risk Assessment*. Each of these changes is discussed below. Finally, the PRI website provides detailed information on how the risk charts were developed and allows users to modify application rates to assess changes in risk profiles.

Modifications to USFS Risk Estimation Methods

Several modifications to USFS/SERA default values were made for this evaluation:

TRVs: Toxicity Reference Values (TRVs) based on LD_{50} or LC_{50} transformed to "No Effect" levels by incorporating an additional uncertainty factor of 20, the methodology used by US EPA to adjust TRVs for assessment effects to endangered species. This transformation ensures that all TRVs are based on "No Effect" levels and allows direct comparison of herbicides. This change has been incorporated into the more recent USFS herbicide risk assessments, and PRI updated the older risk assessments to include this change.

Percent of diet contaminated: In more recent versions of the USFS/SERA herbicide risk assessments, the percentage of an animal's diet assumed to be contaminated was modified to 10% (best-case), 30% (most-probable) or 100% (worst-case). PRI applied the same change to herbicides not yet adopted by USFS, to ensure an "apples to apples" comparison between herbicides. Residue rates assumed for herbicides onfood (fruit, vegetation and prey) were based on the most up-to-date values from USFS/SERA (WorksheetMaker 6.0). The caloric error factor, which was introduced in recent versions of USFS/SERA worksheets, was not utilized here.

Herbicide Residue Rates: USFS changed the residue rates used in the latest version of their risk calculation spreadsheets for estimating exposures from consumption of contaminated fruit, insects and vegetation. This change lowers the best-case predicted dose for wildlife from consumption of contaminated food. In the new versions of the spreadsheets, a new lower residue rate was introduced that is equivalent to the following:

Best-case residue rate = Most-probable rate x (Most-probable rate ÷ Worst-case rate)

These values were incorporated into the calculations for all of the herbicides to ensure comparison of equivalent value.

Insect Contamination Rate: The USFS changed the mass of a honey bee from 93 mg to 116 mg and the surface area from 2.66 cm^2 to 1.42 cm^2 in the more recent herbicide reviews. The net effect is to reduce the estimated dose received by the honey bee. These values were incorporated into the calculations for all of the herbicides to ensure comparison of equivalent values.

Toxicity Reference Values Used to Estimate Risk

Toxicity Reference Values (TRVs) are given in terms of mg of acid equivalent (AE) or active ingredient (AI). NOAEL is the No-Observed-Adverse-Effect Level.

Table 10. Toxicity reference values used to estimate risk

Receptor (units)	Herbicide	TRV Used	USFS TRV	Endpoint
Honeybees (mg/bee)	2,4-D Acid	1075	1075	NOAEL
	Aminopyralid	1075	1075	NOAEL
	Chlorsulfuron	25	25	NOAEL
	Clopyralid	909	909	NOAEL
	Glyphosate	860	860	NOEC
	Imazapyr	860	860	NOAEL
	Triclopyr BEE	620	620	NOAEL[b]
	Triclopyr TEA	620	620	NOAEL[b]
Birds, acute (mg/kg body weight)	2,4-D Acid	415	415	NOAEL
	Aminopyralid	14	14	NOAEL
	Chlorsulfuron	1686	1686	NOAEL
	Clopyralid	670	670	NOAEL
	Glyphosate	1500	1500	NOAEL
	Imazapyr	2510	2510	NOAEL
	Triclopyr BEE	126	126	NOAEL[b]
	Triclopyr TEA	126	126	NOAEL[b]
Birds, chronic (mg/kg body weight)	2,4-D Acid	76	76	NOAEL
	Aminopyralid	184	184	NOAEL
	Chlorsulfuron	140	140	NOAEL
	Clopyralid	15	15	NOAEL
	Glyphosate (no surfactants)	58	58	NOAEL
	Glyphosate (with POEA)	43	43	NOAEL
	Imazapyr	610	610	NOAEL
	TCP[c]	116	116	NOAEL[b]
	Triclopyr BEE	7.5	7.5	NOAEL[b]
	Triclopyr TEA	7.5	7.5	NOAEL[b]
Mammals, small (mg/kg body weight)	2,4-D Acid	25	25	NOAEL
	Aminopyralid	104	104	NOAEL
	Chlorsulfuron	75	75	NOAEL
	Clopyralid	75	75	NOAEL
	Glyphosate	500	500	NOAEL
	Imazapyr	738	738	NOAEL
	Triclopyr BEE	440	440	NOAEL[b]
	Triclopyr TEA	440	440	NOAEL[b]

Receptor (units)	Herbicide	TRV Used	USFS TRV	Endpoint
Mammals, large (mg/kg body weight)	2,4-D Acid	5	5	NOAEL
	Aminopyralid	50	50	NOAEL
	Chlorsulfuron	5	5	NOAEL
	Clopyralid	15	15	NOAEL
	Glyphosate	500	500	NOAEL
	Imazapyr	738	738	NOAEL
	TCP[c]	12	12	NOAEL[b]
	Triclopyr BEE	0.4	0.4	NOAEL[b]
	Triclopyr TEA	0.4	0.4	NOAEL[b]
Fish (mg/liter of water)	2,4-D Acid	4.8	95.6	$LC_{50} \div 20$
	Aminopyralid	50	50	NOEC
	Chlorsulfuron	30	30	NOEC
	Clopyralid	5[a]	103	$LC_{50} \div 20$
	Glyphosate (no surfactants)	0.5	0.5	NOAEC
	Glyphosate (with POEA)	0.048	0.048	NOAEC
	Imazapyr	10.4	10.4	NOAEC
	TCP[c]	0.18	0.18	NOAEC[b]
	Triclopyr BEE	0.091	0.091	NOAEC[b]
	Triclopyr TEA	20	20	NOAEC[b]
Aquatic Invertebrates (mg/liter of water)	2,4-D Acid	1.25[a]	25	$LC_{50} \div 20$
	Aminopyralid	89	89	NOEC
	Chlorsulfuron	10	10	NOEC
	Clopyralid	23.1	23.1	NOEC
	Glyphosate (no surfactants)	2.7	2.7	NOAEC
	Glyphosate (with POEA)	0.075	0.075	NOAEC
	Imazapyr	41	41	NOAEC
	TCP[c]	0.55	0.55	NOAEC[b]
	Triclopyr BEE	0.045	0.045	NOAEC[b]
	Triclopyr TEA	25	25	NOAEC[b]

[A] To ensure comparison of equivalent endpoints between herbicides, all TRVs *values expressed as LC_{50} or LD_{50} values were translated by either USFS or PRI to "No Effect" levels by incorporation of an uncertainty factor of 20, similar to that used by US EPA to protect endangered species. This practice was only recently incorporated into the USFS methodology, so PRI implemented these changes for the herbicides reviewed by USFS prior to the change.*

[b] For triclopyr and TCP toxicity to mammals, USFS used allometric parameters that correct the NOAEL for the amount of food and water consumed, based on body weight and size, to adjust for differences between the test species and the taxa to which the TRV is applied.

[c] TCP is the primary degradation product of triclopyr. Because triclopyr must degrade before any TCP is produced, only the chronic scenarios of large mammals and birds eating vegetation involve potential exposure to TCP. The other scenarios are acute events, where triclopyr has not yet degraded to form TCP. Chronic exposure to treated vegetation will result in exposure to a combination of the parent compound and TCP, which degrade at similar rates. The risk bars are based on the TRV for the more toxic (lower value) of the two to produce a more protective risk estimate. For both mammals and birds, the risk charts are based on the TRV for triclopyr acid, since it has the lower value.

Herbicide Half-Life

Herbicide half-life is a measure of persistence in the environment. Herbicides that are persistent in the soil environment continue to have herbicidal activity and cause adverse effects on the ecosystem until the concentration drops below a level that is toxic to plants. The range of half-lives for the herbicides in soil under aerobic conditions—in the presence of oxygen and microbes—can vary by a factor of ten or more for each herbicide. Exposure to sunlight can accelerate decomposition of some herbicides. The longest half- lives are typically relevant under arid conditions where microbial degradation rates are low. Anaerobic degradation is usually slower than aerobic degradation. In general, glyphosate is expected to be less persistent than other herbicides considered in this assessment, while imazapyr and aminopyralid are among the most persistent. Triclopyr BEE and TEA rapidly degrade or dissociate to triclopyr acid, so the persistence of triclopyr degradates—triclopyr acid and TCP— is most relevant to triclopyr applications. Organic herbicides such as clove oil, pelargonic acid, and limonene have very short half- lives (a few days to a week), which limits their potential for exposure.

Figure 4 shows the range of half-lives for the herbicides in soil under aerobic conditions. In the plot, herbicides are arranged in order of the Central value of their measured half-life. The Upper, Lower and Central values on Figure D-1 are based on a review of the academic literature and the values used by government agencies, including US EPA, USFS, California Department of Pesticide Regulation (DPR), and the Oregon Department of Environmental Quality (ODEQ) (see PRI website for more information).

The Central values for the herbicides used in the plots (except for 2,4-D and aminopyralid) in Figure D-1 are the half-life values used by USFS in its risk assessments as the Central half-life estimate in soil, with the values for 2,4-D from DPR's environmental fate review and for aminopyralid from US EPA's risk assessment. Lower and Upper values used in the figure are taken from US EPA's risk assessments or from DPR's or ODEQ's environmental fate documents summarizing the available literature studies. Half-lives vary depending on test conditions, and comparable studies conducted under the same test conditions were not always available for every herbicide. When soil values were unavailable, the half-life on fruit was used.

Figure 4 is intended to provide as much as possible an "apples-to-apples" comparison of aerobic soil half- lives. However, imazapyr does not degrade in soil under aerobic conditions, so a field dissipation half-life (5.9 years) is used, in order to provide a numerical point of comparison to other herbicides. Note that half-lives of herbicides in water or in anaerobic sediments (such as wetlands) may be different than the aerobic soil half- lives presented in Figure 4 For most pesticides, the anaerobic half-life (in the absence of oxygen) is longer than the aerobic half-life. Sunlight and processes that dissipate herbicides in the environment like rainfall runoff, absorption by plants, or irreversible binding to soils can also alter the persistence of a chemical in the treated area.

Figure 4 shows the total range of half-lives observed for the different chemicals. Half-life values used by the USFS in their worksheets are those used to produce the charts and are more narrowly constrained to reflect half- lives under the most common conditions.

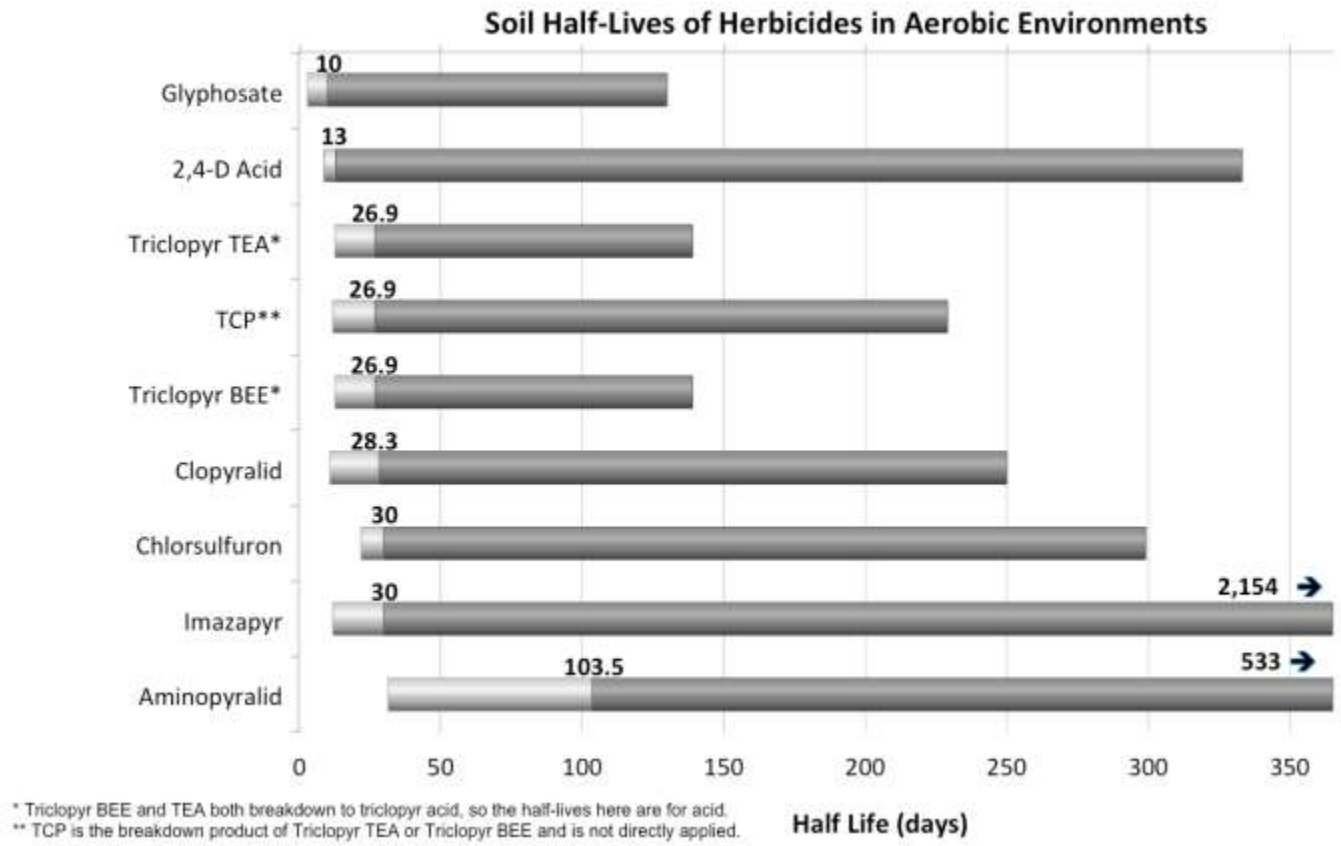


Figure 4: Comparison of the range of herbicide half-lives under aerobic conditions in soil. The high end of the range is typically under arid conditions where microbial degradation rates are low. Exposure to sunlight can accelerate decomposition and shorten the half-life of some herbicides. Sources are described after Table 10. For aminopyralid, see EPA Fact Sheet 2005. For imazapyr, see EPA 2007 Appendix A Imazapyr Effects Determination for the CA Red-legged frog.

Water Contamination Rates

Water contamination rates are a measure of how much of an applied herbicide will run off of the treated area into nearby water bodies. Maximum or peak concentrations of herbicides in water bodies receiving runoff are typically observed when rainfall or irrigation occurs soon after treatment, before the herbicide has degraded substantially. The concentration of herbicide in this "first-flush" runoff may potentially impact aquatic organisms and terrestrial animals that make contact with or drink contaminated water. The potential of herbicides to move off-site in runoff water depends on water solubility, half-life, and the ability of the herbicide to bind to soil. The site characteristics are relevant too, as different soil types bind to herbicides differently. Bare or impermeable soils are much more prone to runoff than vegetated areas; sandy soils are susceptible to leaching that may result in groundwater contamination.

The risk charts use the USFS method (based on the Groundwater Loading Effects of Agricultural Management Systems (GLEAMS) model) to estimate the concentration of each herbicide in water for an application to 10 acres, no buffers along the edge of the treated area, and rainfall after the application based on averages for a variety of sites. The range of water contamination rates is based on the range of site variables such as soil type and chemical properties. Use of buffer zones around water bodies will reduce water contamination.

Water contamination rates are measured in units of milligrams of herbicide per liter per pound of herbicide applied per acre (mg/L per lb/acre). Actual herbicide concentrations in the receiving water body will depend on how many pounds of active ingredient are applied to land that drains to the water body. Use of herbicides with application rates of fractions of a pound per acre (see Table 9) will generally result in lower concentrations than herbicides with higher application rates. Predicted concentrations in the receiving water bodies for the half-maximum application rates for each active ingredient are shown in Figure 5. These concentrations were used to estimate the risks displayed in the charts for aquatic species and for animals drinking the water.

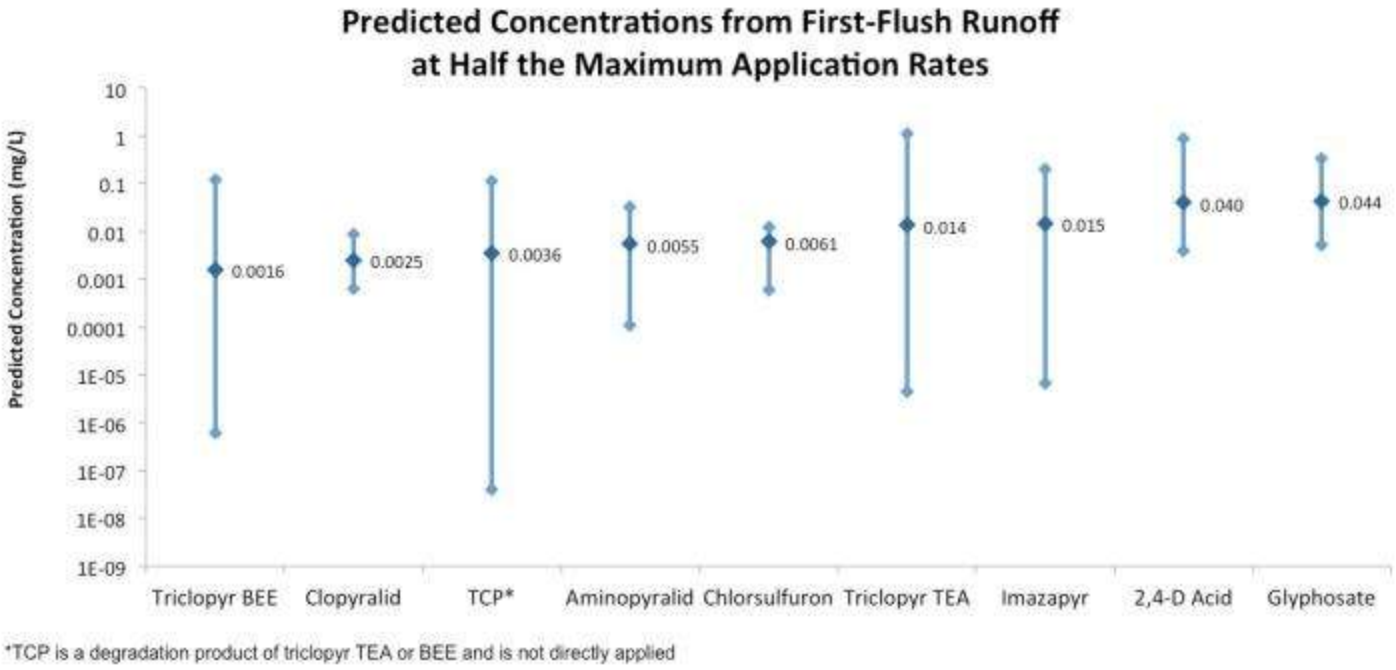


Figure 5: Comparison of the range of predicted concentrations in peak runoff after terrestrial application at half-maximum application rate. Factors affecting predicted concentrations include application rate, water solubility, half-life, and the ability of the herbicide to bind to soil (Koc). Use of buffer zones near surface waters will help to reduce water contamination. Source: "Estimated Water Contamination Rates" in USFS risk assessment worksheets at www.fs.fed.us/foresthealth/pesticide/worksheets.shtml.

Appendix C Sample Record keeping forms

Treatment Form-Front

2015
Herbicide/Manual Treatment Data Form

Project ID # or Name:	Project Complete? **Y** or **N** (add notes)
	High Priority for next year? **Y** or **N**

Name of Entity for whom Treatment was applied: Clallam County

Road Name:_____ City: _____ State: _____ Zip: _____

Min and Max Address or Begin and End Mile Post _____

GIS Road Segment (if known) _____ Total Miles Treated:_____

General Activity Fields

Work Force: Crew Members Present:

Site/Inventory Fields

Start Date	Stop Date	Acres examined for weeds	Treatment Site (circle one)	**Total Manual Infested Area Treated: (DO NOT lump plants together)**
			Road edge/ROW Trail Pit Admin Site Other	**ACRES**

Weeds Treated (Just the PLANTS code is OK)	**Infested Area Treated** (DO NOT lump plants together)	% of area examined for weeds infested with this species (lump plants together – use cover classes 1 - 9 listed below)	**M**anual/**H**erbicide or **S**urvey
	acres		
	acres		
	acres		
	acres		
	acres		

† **Cover Classes: 1** = Trace, **2** = 1 – 3%, **3** = 3 – 5% **4** = 5 – 10%, **5** = 10 – 25%, **6** = 25 – 50%, **7** = 50 – 75%, **8** = 75 –%, **9** = 95 – 100%
Note: Cover classes are meant to be *approximations only.*

All Licensed Applicators: Name and License # _____

Firm Name: _____ Phone # _____

Firm Address: _____ City: _____ State: _____ Zip: _____

Application Date	Time Start	Time Stop	Temp (F)	Wind Speed (MPH)	Wind Direction	Cloud Cover	Remarks – Weather forecast

Application Area (acres)	Total Volume of Mix Applied (gal)	Diluent	Special comment
		Water	

Product Name	EPA Registration #	Amount of herbicide used (oz)	Herbicide Applied/Acre or other measure	Concentration Applied

Was this application made as a result of a permit? Yes No
If yes, Permit # _____

WA State NPDES Acres:

Notes:

Page 2

Sample Monitoring Form

Clallam County
Weed Treatment Monitoring

Examiner name:_____

Evaluation Date:_____

Ref #	
Project # and Name	
From "Comments": **Road name with BMP & EMP** **–OR-** **Min and Max Address**	
Date(s) of treatment	
Herbicide or Manual treatment (circle one)	

Weeds Treated (Scientific name or code)	**Infested Area Treated (acres)**	**Cover class from "% area examined for weeds infested with this species"**	**Percent efficacy of treatment (use codes on next page)**

Do you think this treatment area is a high priority for retreatment next year? Yes / No

Please provide comments on the next page, if you have any.

Instructions: All information on page 1 of this datasheet comes from the "Herbicide/Manual Treatment Data Form", except for:

- **Examiner name**
- **Evaluation Date**
- **Percent efficacy of treatment**

For Percent efficacy of treatment, enter the code that best approximates the percent of the population that was eradicated:

Code	% Efficacy	Rating	Description
0	0	No effect	No effect can be detected on the target species population
03	1 – 5	Failure	Little to no effect can be detected on the target species population.
15	6 – 25	Poor	Treatment killed less than a quarter of the target species population.
35	26 – 50	Marginal	Less than half of the target species population was controlled.
65	51 – 75	Fair	Over half of the target species population was controlled.
85	76 – 90	Good	Treatment was successful in killing most of the target species population
95	91 – 99	Excellent	Over 95% of the target species population has been killed with the treatment.
100	100	Complete	Not a single individual of the target species population was found after a complete survey of the site. The infestation was eradicated.
UN	UNK	Unknown	Treatment efficacy/success cannot be determined.

Comments:

Appendix D Sample Press Release and Public Notice

March 1, 20__

PUBLIC NOTICE

Clallam County is beginning the year 20__ Integrated Roadside Weed Control program which may include spot treatments of herbicide to control specific noxious weeds and invasive species of special concern along selected portions of county right-of-way. Approximately _____ miles of road are scheduled for treatment this year. Notices indicating which herbicide has been applied, the application date, and the target weed species will be posted onsite. The Integrated Roadside Weed Management Plan, which contains information about target weeds, locations, and treatment methods can be viewed online at _____ or contact the county for further information at 360-417-2442.

Property owners who do not wish to have their adjoining right-of-way treated with herbicide have the option of keeping the right-of-way abutting their property weed free by applying for an Owner Will Control Agreement with Clallam County. Forms can be obtained online at _____ or by contacting the county at (360) 417-2442.

NOTICE

Herbicide(s) will be applied to the Clallam County right-of-way any time from/ on :
(check herbicides that apply)

_____, 2016
(when pre-posting, correct date to correspond to actual treatment date)
to spot treat noxious weeds, which threaten agriculture, native vegetation, and habitat in this area:

- ❑ Milestone
- ❑ Element 3A
- ❑ Transline
- ❑ Polaris
- ❑ AquaNeat
- ❑ Weed Destroy AM40
- ❑ Fusilade II

Targeted Weed Species include, but are not limited to:

NO USE RESTRICTIONS ARE IN PLACE

Avoid contact with treated vegetation until spray has dried.

FOR MORE INFORMATION CONTACT:

(Applicator to list a number for a contact that can explain the treatment to the caller)

_____ Phone Number:_____

Or Clallam County Noxious Weed Control Program at (360) 417-2442

Appendix F Sample Owner Will Control Packet-Draft
Agreement Sample
INCOMPLETE

- Liability form- must be reviewed by legal, *in development*
- Control Recommendation Form-*in development*
- Option cultural roadside enhancements-*In development*

OWNER WILL CONTROL

By entering into this agreement, owner will agree to control noxious weeds and other weeds of concern as described in Appendix __ of this agreement on county right-of-way adjacent to owner's property located at _____.
For the purpose of this agreement, 'control' will consist of complete removal of all above ground biomass and as much of the root system as is feasible of weeds listed in your packet, as well as any additional weeds of concern as determined by the county.
If noxious or other weeds of concern are observed on right-of-way adjacent to above named address, County will notify property owner of their presence. Property owner will then have ten (10) days to completely remove weeds as required by this agreement. If owner fails to control weeds in that timeframe, this agreement will be terminated and weeds will be controlled as determined by the County, including by the use of herbicides.
If the Owner will Control agreement is terminated as described above, property owner may apply to reenter into a new Owner will Control agreement the following calendar year.
This agreement is valid from the date signed by both parties until December 31 of the same year. County will mail applications for the following year to all current signees of this agreement. As treatments may begin as early as late February, property owners who wish to enter into a new Owner will Control agreement are required to return signed agreements by January 31st, or within 30 days of receiving the agreement, whichever is later.

_____ _____
Property Owner Date

_____ _____
County Representative Date

Sample Failure to Control Warning

County Logo
223 E Fourth St, Suite 15
Port Angeles, WA 98362

Date

RE: Failure to fulfill 'Owner will Control' agreement

Dear Property Owner,

You entered into an Owner will Control agreement with Clallam County Road Department regarding noxious and invasive weeds on the county roadside adjacent to your property.

Crews were recently in your area and found the roadside adjacent to your property has not been maintained as required by the terms and conditions of the agreement (see enclosed).

You have ten (10) days from date of this letter to control weeds as outlined in the Owner Will Control agreement. If the right-of-way is not adequately maintained as described in the agreement the agreement will be immediately terminated and weeds of concern will be controlled as determined by the County, including by the use of herbicides.

If the Owner will Control agreement is terminated as described above, you may still apply to reenter into an Owner will Control agreement for next calendar year.

If you have any questions, please call _____ at _____

Or email us at:_____

This is the only notice you will receive regarding this matter.

Sincerely,

County Representative
Clallam County Roads Department

Enclosed: Owner Will Control agreement

Appendix G Roadside weed life cycle, growth form, category and status

Common Name	Scientific Name	Life Cycle[1]	Growth Form	Threat	Cate -gory	Status
alyssum, hoary	*Berteroa incana*	A, B, P	Forb	Aggressive invader in fields of forage crops; toxic to horses	1	NCR
bindweed, field	*Convolvulus arvensis*	P	Forb	Seriously interferes with agriculture	1	NR
brome, ripgut	*Bromus rigidus*	A	Grass	Long seed awns cause injury to nose and eyes of grazing animals; known to occur in Clallam County, but not on roadsides; will be treated under EDRR protocol if observed.	1	ISSC
butterfly bush	*Buddleia davidii*	P	shrub	Invades natural areas; dense stands crowd out native vegetation in riparian areas and interfere with natural succession	1	NR
cheatgrass or downy brome	*Bromus tectorum*	A	Grass	Depletes soil moisture in early spring; fire hazard in summer; known to occur in Clallam County, but not on roadsides; will be treated under EDRR protocol if observed.	1	ISSC
chicory	*Cichorium intybus*	P	Forb	Only found in the Dungeness Valley where it is starting to spread	1	ISSC
cinquefoil, sulfur	*Potentilla recta*	P	Forb	Not readily grazed by livestock and wildlife; forms dense stands	1	NCR
comfrey	*Symphytum officinale*	P	Forb	Used medicinally for poultices; liver damage when ingested; can form dense stands; difficult to control once established	1	ISSC
fennel, common*	*Foeniculum vulgare*	P	Forb	Dense stands exclude native vegetation	1	NCR
hawkweed, orange	*Hieracium aurantiacum*	P	Forb	Dense stands exclude other species; bitter and unpalatable, little forage for livestock and wildlife	1	NCR
herb Robert	*Geranium robertianum*	A, B	Forb	Rapid spreading; displaces native herbaceous plants; allelopathic, inhibits the germination of small seeded forbs in forest understory	1	N**
hogweed, giant	*Heracleum mantegazzianum*	B, P	Forb	Skin contact with sap causes severe dermatitis on people and animals	1	NR*
knapweed, diffuse	*Centaurea diffusa*	B, P	Forb	Spreads seed by tumbling; prickly flower heads; unpalatable after early spring	1	NCR*
knapweed, meadow	*Centaurea x moncktonii*	P	Forb	Outcompetes pasture species; degrades wildlife habitat; interferes with agriculture	1	NCR
knapweed, spotted	*Centaurea stoebe*	B	Forb	Allelopathic plant that can inhibit the germination of grasses; forms dense stands that exclude desired plants and wildlife	1	NCR
knotweed, Bohemian	*Polygonum x bohemicum*	P	Subshrub	Easily spreads by disturbance; dense colonies eliminate other plant species and can degrade fish habitat; causes structural damage to human structures	1	NCR
knotweed, giant	*Polygonum sachalinense*	P	Forb	Easily spreads by disturbance; dense colonies eliminate other plant species and can degrade fish habitat; causes structural damage to human structures	1	NCR
knotweed, Japanese	*Polygonum cuspidatum*	P	Subshrub	Easily spreads by disturbance; dense colonies eliminate other plant species and can degrade fish habitat; causes structural damage to human structures	1	NCR
laurel, spurge	*Daphne laureola*	P	Shrub	Toxic to humans and animals; contact with plants can cause dermatitis	1	NR
loosestrife, purple	*Lythrum salicaria*	P	Forb	Dense stands eliminate other plant species; poor palatability; degrades wildlife habitat and hunting and fishing areas.	1	NCR*
old man's beard	*Clematis vitalba*	P	Forb - vine	Climbing growth smothers other plants, even trees	1	NR
poison hemlock	*Conium maculatum*	B	Forb	Highly toxic to humans and animals; all parts of the plant are toxic; severe birth defects	1	NCR

Common Name	Scientific Name	Life Cycle[1]	Growth Form	Threat	Cate -gory	Status
ribbon grass	*Phalaris arundinacea*	P	Grass	Aggressive invader displaces other plants in wet sites; an ornamental form of reed canarygrass	1	NR
tansy ragwort	*Senecio jacobaea*	B	Forb	Poisonous to horses, cattle, and pigs; animals grazing tansy can produce tainted milk, may result in potentially toxic residue in honey	1	NCR
tansy, common	*Tanacetum vulgare*	P	Forb	Dense stands degrade forage value; toxicity issues for humans and livestock	1	NR
teasel, common	*Dipsacus fullonum*	B	Forb	Forms dense stands of prickly, unpalatable plants; degrades habitat and reduces accessibility	1	NR
whitetop, hairy	*Lepidium appelianum*	P	Forb	Monocultures displace desirable plants; unpalatable; can be form toxic to cattle	1	NR
wormwood, absinth	*Artemisia absinthium*	P	Shrub	Aggressive invader, will outcompete desirable forbs and grasses in pastures, fields and native grasslands; plants have a strong bitter taste and odor, may affect milk quality	1	NR
blackberry, evergreen	*Rubus laciniatus*	P	Subshrub	Dense canopies crowd out native species; impenetrable barrier	2	NW
blackberry, Himalayan	*Rubus armeniacus*	P	Shrub	Dense canopies crowd out native species; impenetrable barrier	2	NW
broom, Scotch	*Cytisus scoparius*	P	Shrub	Forms dense stands; unpalatable; interferes with forest regeneration; fire hazard; scent can exacerbate human grass allergies; seeds are toxic to horses and livestock	2	NW
burdock, common	*Arctium lappa*	B	Forb	Forms large rosettes; hooked spines on seeds become entangled in fur of animals	2	WR
canarygrass, reed	*Phalaris arundinacea*	P	grass	Unpalatable unless young, forms dense stands that crowd out native plants; especially difficult to control; serious wetland invader; can stop the process of succession in riparian sites, impedes tree seedling establishment	2	NW
carrot, wild	*Daucus carota*	B	Forb	Damages agricultural commodity as it may cross pollinates with domestic carrot, seriously degrading the quality of commercial carrot seed production	2	NW
iris, yellow flag	*Iris pseudacorus*	P	Forb	Toxic to humans and animals; displaces vegetation at wet margins of ditches, ponds, and lakes; plant resins can cause skin irritation in humans	2	NR
peavine, everlasting	*Lathyrus latifolius*,	P	Forb - vine	Forms dense thickets; seeds can be toxic to livestock; seriously interferes with forest regeneration where it invades from edges of timber units	2	ISSC
thistle, bull	*Cirsium vulgare*	B	Forb	Aggressive competitor, unpalatable for cattle	2	NW
thistle, Canada	*Cirsium arvense*	P	Forb	Aggressive competitor, unpalatable; decreases forage; host species for several agricultural pests	2	NW
bindweed, hedge	*Calystegia sepium*	P	Forb - vine		3	WW
buttercup, creeping	*Ranunculus repens*	P	Forb		3	WW
catsear, common	*Hypochaeris radicata*	P	Forb	Crowds out palatable forage species	3	NW
clover (several)	*Trifolium spp.*	P	Forb		3	WW
daisy, oxeye	*Leucanthemum vulgare*	P	Forb	Livestock avoid grazing; milk from dairy cows has unpleasant flavor	3	NW
dandelion, common	*Taraxacum officinale*	P	Forb		3	WW
horsetail	*Equisetum*	P	Forb	Large quantities poisonous to livestock	3	WW
orchard grass	*Dactylis glomerata*	P	Grass		3	WW
St Johnswort, common	*Hypericum perforatum*	P	Forb	Causes photo-sensitization when grazed; toxic at all stages of growth	3	NW

[1] A - annual; B - biennial; P - perennial

ISSC = **I**nvasive **S**pecies of **S**pecial **C**oncern, **NCR** = **N**oxious, **C**ontrol **R**equired**, NR** = **N**oxious**, R**are **NW** = **N**oxious, **W**idespread
WR = **W**eedy**, R**are, **WW** = **W**eedy**, W**idespread

Appendix H Focus area maps of target roads

Maps 1, 2 and 4-7show known weed infestations targeted for control on and around roads identified in Table 6.

Map 3 shows known infestations of bull and Canada thistle as well as Scotch Broom that are targeted for control on and around roads identified in Table 7.

East Clallam County

Map 1. Diamond Point Focus Area
Map 2. Happy Valley-Palo Alto Road Focus Area
Map 3. Thistle –Scotch Broom Demonstration Focus Area-Contains

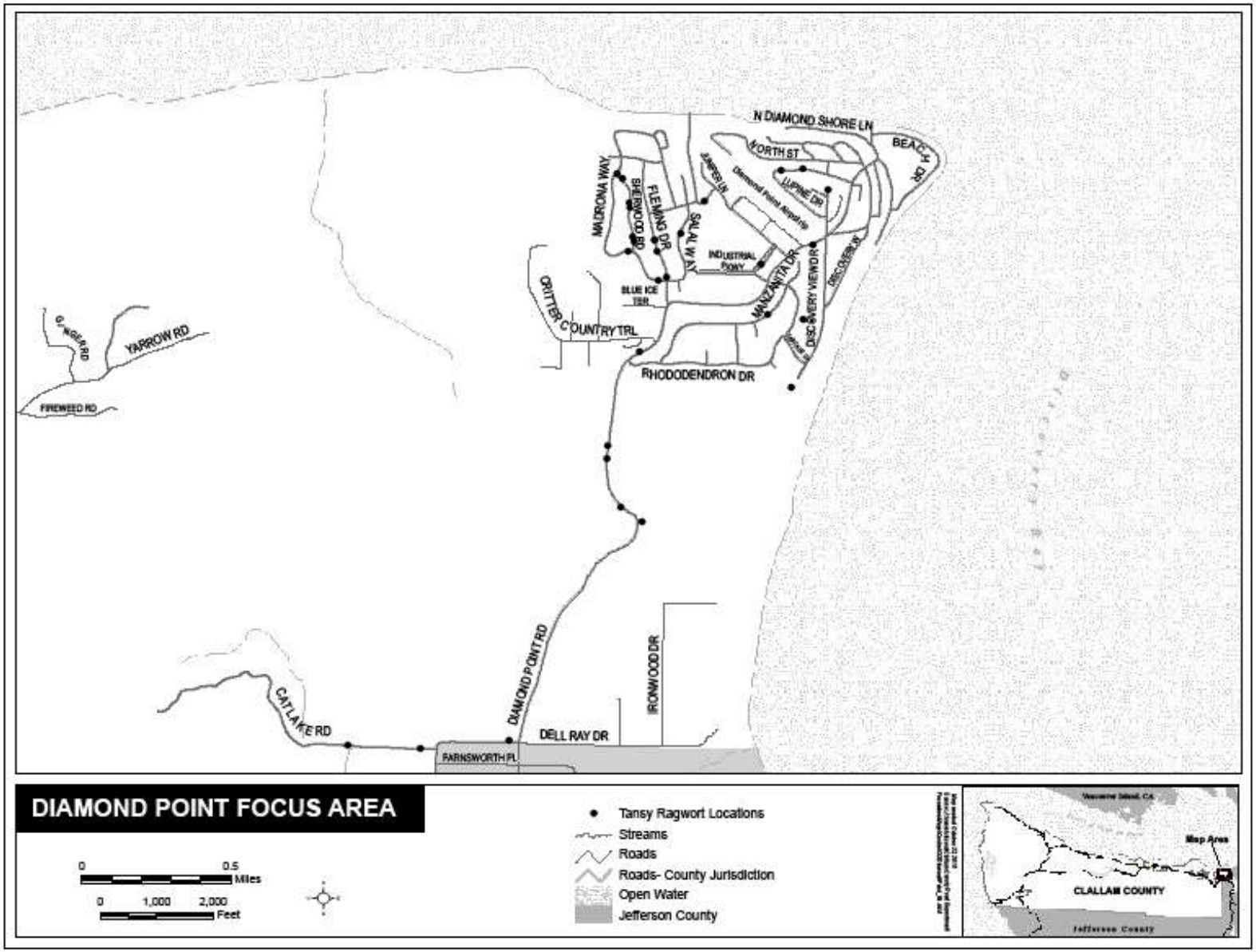
PA/Central Clallam County

Map 4. Black Diamond/Lauridsen Blvd. Focus Area
Map 5. Lake Sutherland/East Beach Focus Area
Map 6. Whiskey Bend/Lyre River Focus Area

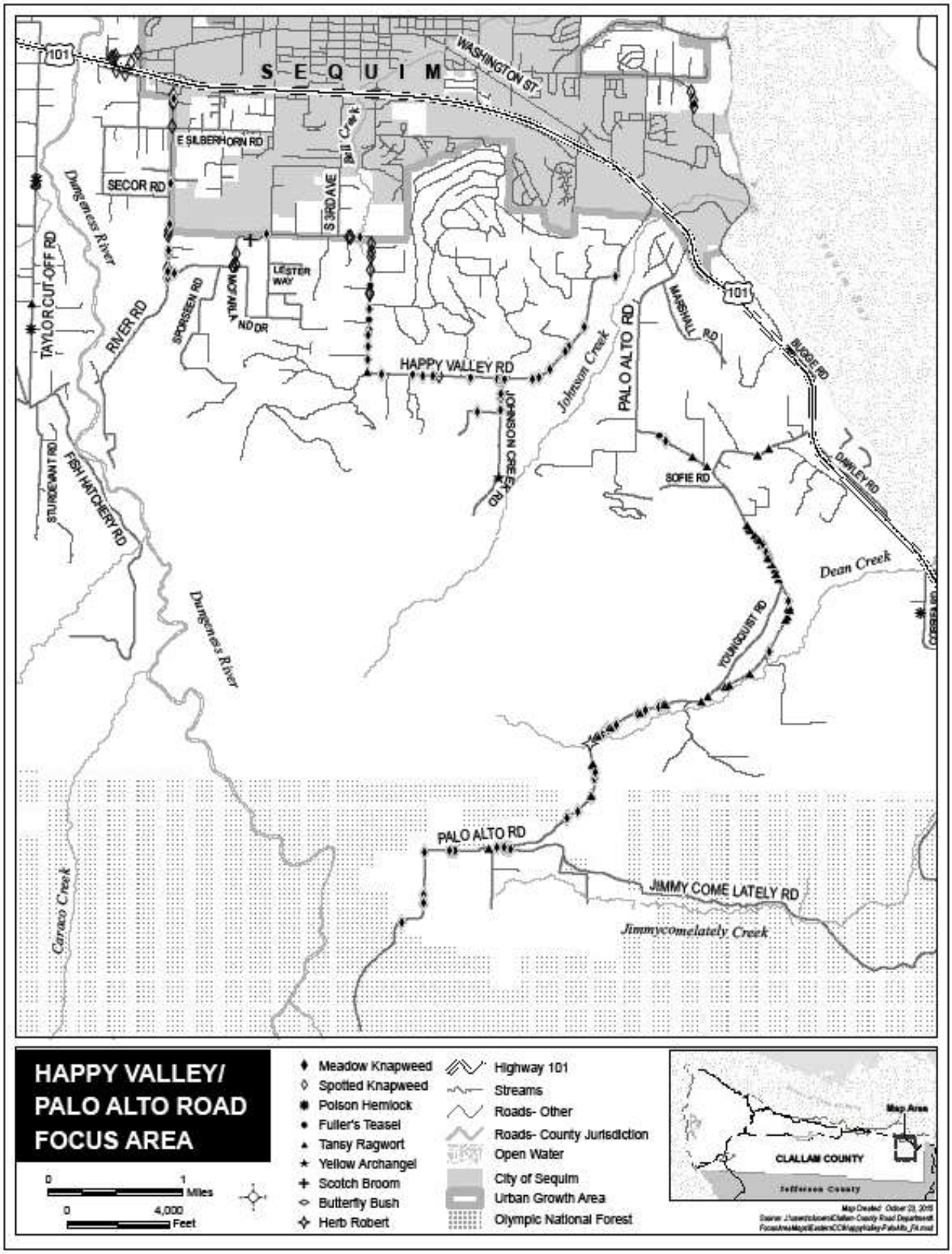
West Clallam County

Map 7. Lake Pleasant Focus Area

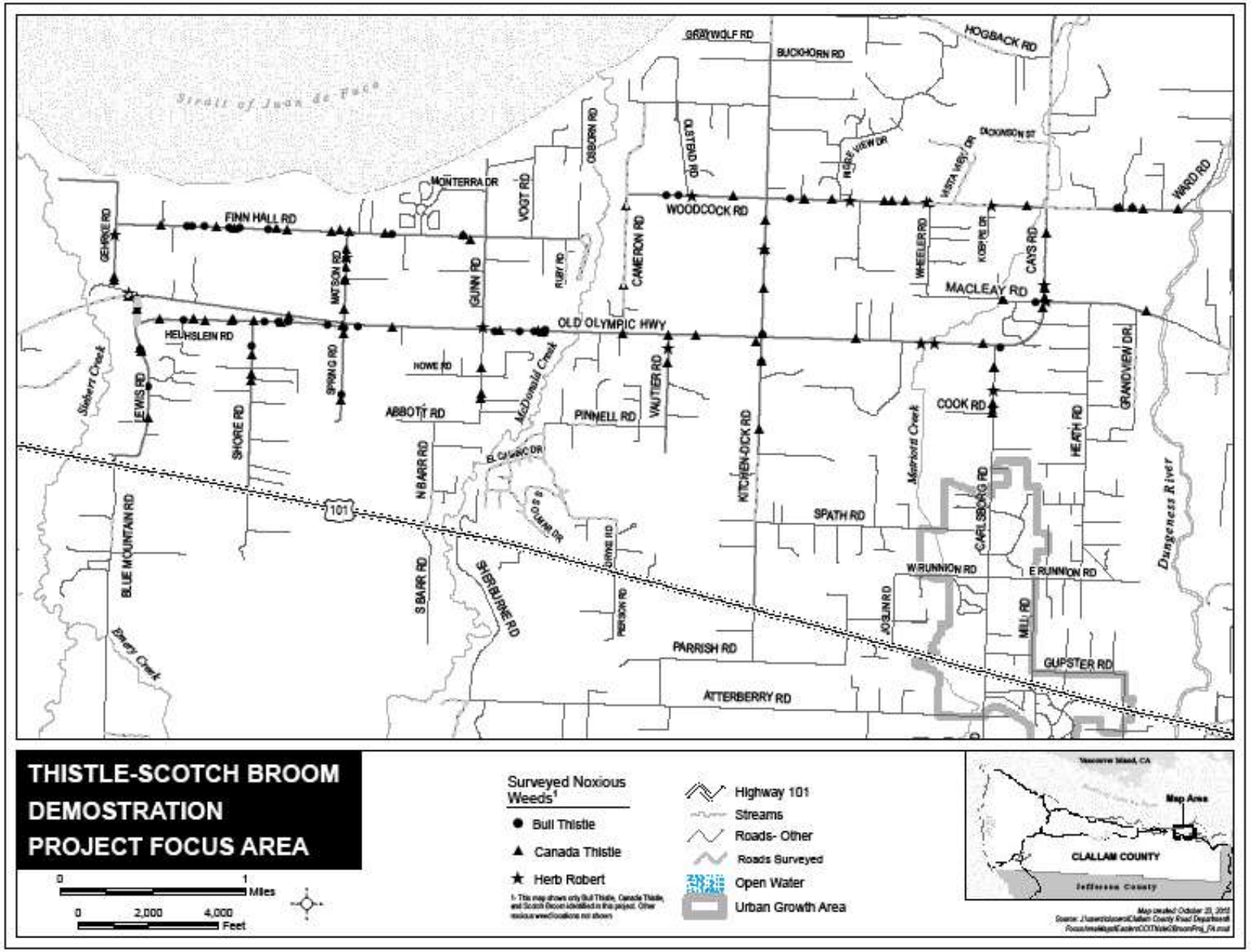
Eastern Clallam County
Map 1.Diamond Point Focus Area



Map 2. Happy Valley-Palo Alto Road Focus Area

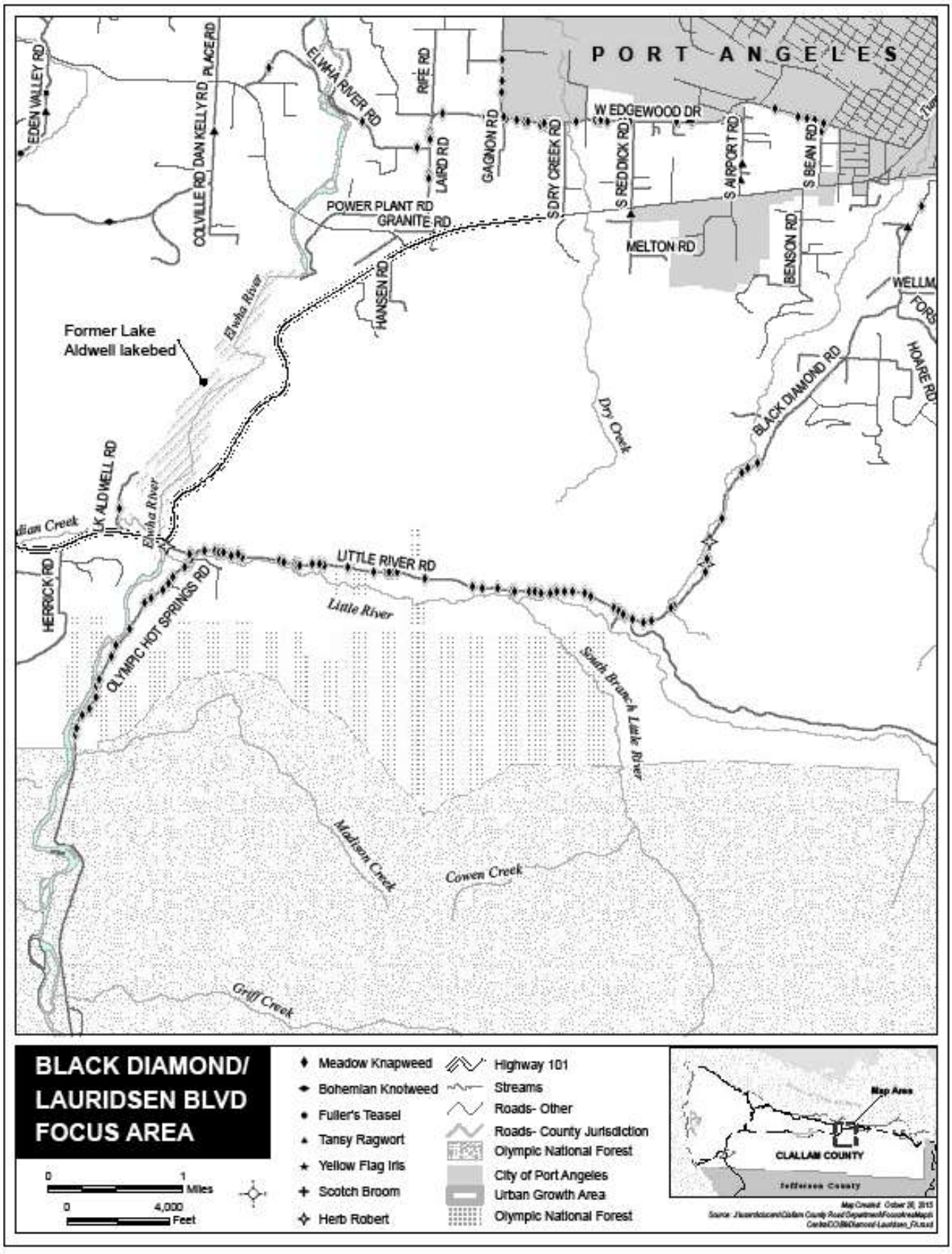


Map 3. Thistle –Scotch Broom Demonstration Focus Area

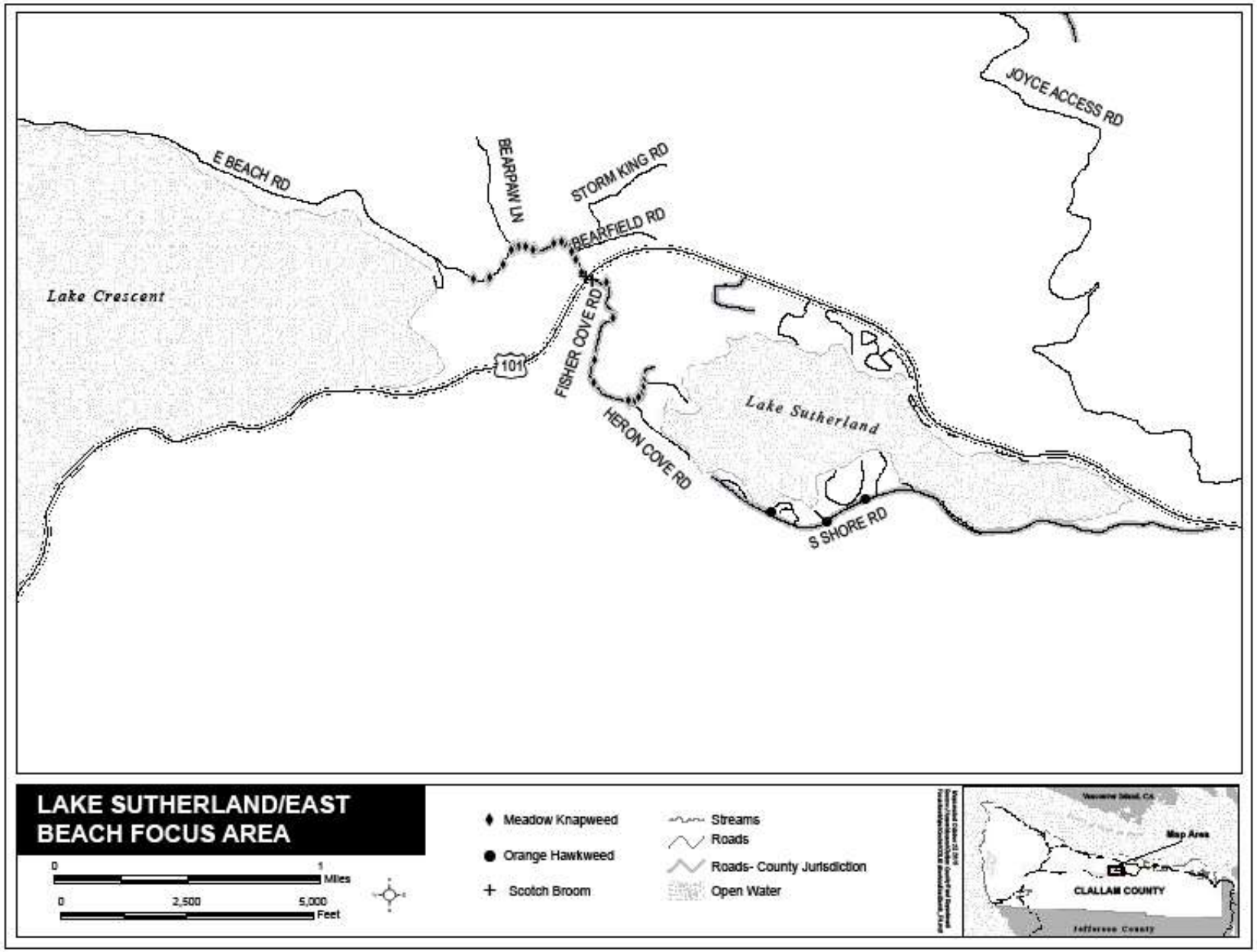


PA Central

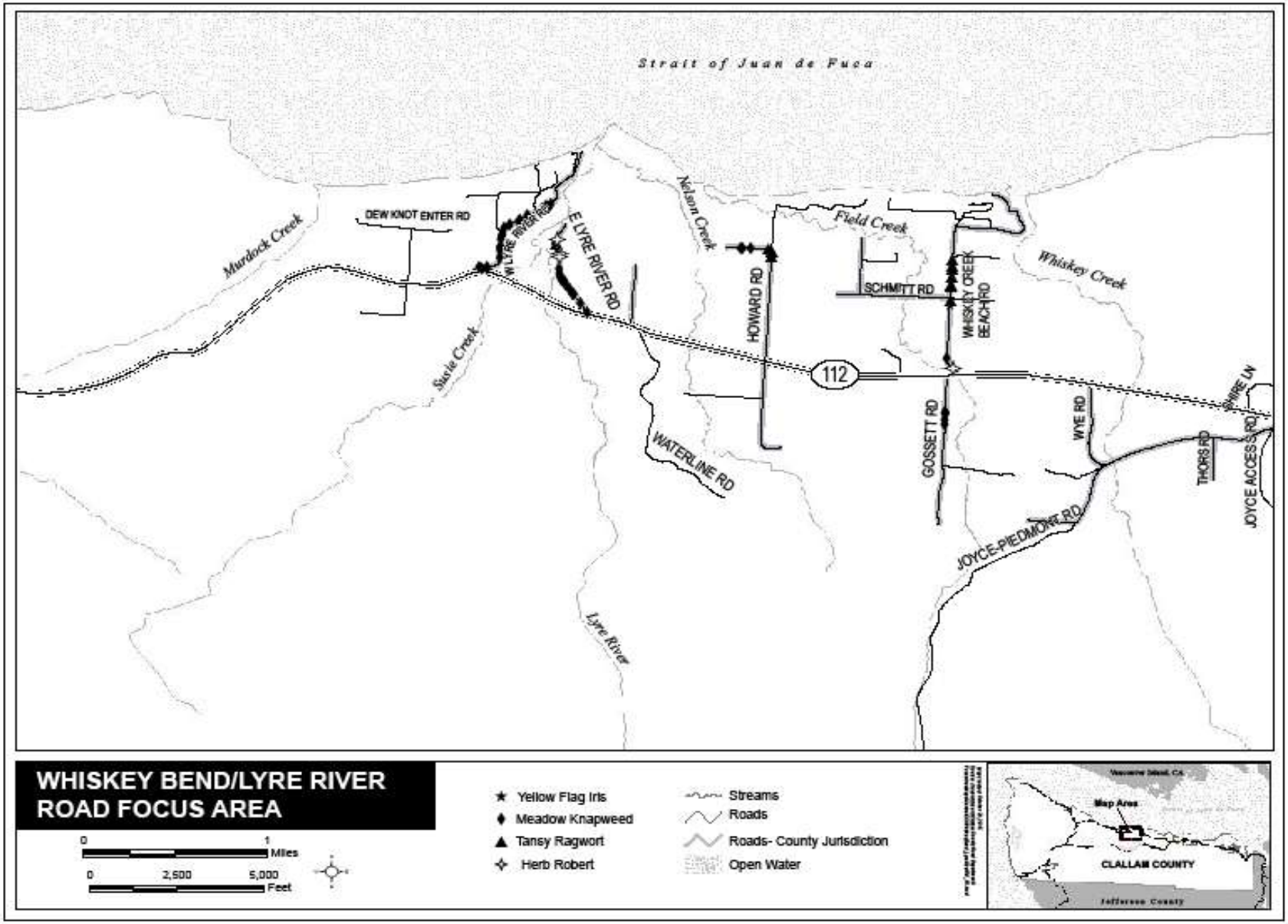
Map 4. Black Diamond/Lauridsen Blvd. Focus Area



Map 5. Lake Sutherland East Beach Focus Area

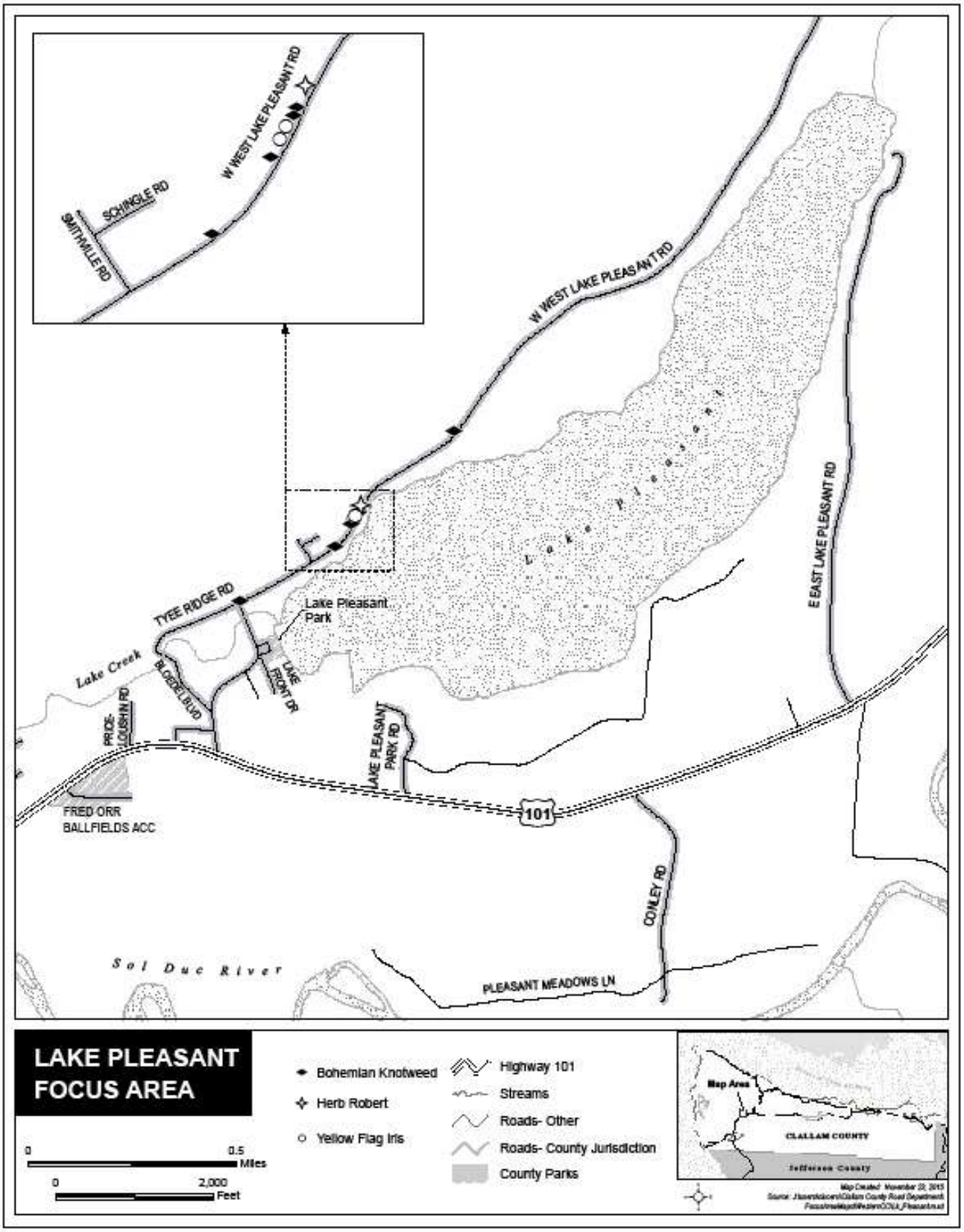


Map 6. Whiskey Bend/Lyre River Focus Area



West Clallam

Map 7. Lake Pleasant Focus Area



Appendix I Known roadside weed locations

The following table contains known roadside weed locations based on 2015 surveys of approximately 250 of 528 miles of the county road system. It does not include most Category 2 weeds unless they were part of the Thistle-Scotch Broom Demonstration Focus Area or found to be locally limited during the survey (Table 11).

Min Address - the first location a weed was recorded on the associated road, based on information from the county's GIS system.
Max Address - the farthest address at which a weed infestation was noted.
Miles - the length of road where weed infestations were documented, not the total length surveyed.
 # Patches - the number of times an infestation was noted in the associated road segment.

The infestation area is noted in both square feet and the equivalent acres. These cells are blank where no information was recorded. Summaries for each road are **bolded**.

Table 11. All roadside weed locations in approximately 250 miles of roads surveyed in 2015.

Road	Weed	Min Address	Max Address	Miles	Area (ft^2)	Area (acres)	# Patches
Atterberry Road	Field bindweed	1080	2099	1.0	180	0.00413	1
	Meadow knapweed	2100	2159	0.2	2	0.00005	3
	Spotted knapweed	2340	2779	0.4			1
Summary		**1080**	**2779**	**2.0**	**182**	**0.00418**	**5**
Barker Road	Poison hemlock	**60**	**159**	**0.04**			**1**
Black Diamond Road	Herb Robert	2440	4419	2.0	500	0.01148	2
	Meadow knapweed	1	519	1.9	642	0.01474	13
Summary		**1**	**4419**	**3.9**	**1142**	**0.02622**	**15**
Blue Mountain Road	Common tansy	5540	6159	0.6			1
	Herb Robert	4000	4509	0.5	500	0.01148	2
	Meadow knapweed	590	1469	0.6	167	0.00383	13
	Spotted knapweed	590	1469	0.9	50	0.00115	1
	Tansy ragwort	310	479	0.8	16	0.00037	5
Summary		**310**	**4509**	**1.9**	**683**	**0.01568**	**22**
Business Park Loop	Poison hemlock	170	409	0.2	12	0.00028	1
	Spotted knapweed	1	169	0.2	521	0.01196	10
Summary		**1**	**409**	**0.4**	**533**	**0.01224**	**11**
Cameron Road	Tansy ragwort	1	119	0.1	45	0.00103	1
	Canada thistle	140	759	0.6			2
Summary		**1**	**759**	**0.7**	**45**	**0.00103**	**2**
Carlsborg Road	Canada thistle	1410	1519	0.2			3
	Scotch broom	1	109	0.2	45	0.00103	3
	Spotted knapweed	110	179	0.1	59	0.00135	11
Summary		**1**	**1519**	**0.5**	**104**	**0.00239**	**17**
Cat Lake Road	Tansy ragwort	**1**	**1259**	**1.2**	**8**	**0.00018**	**2**

Road	Weed	Min Address	Max Address	Miles	Area (ft^2)	Area (acres)	# Patches
Cays Road	Bohemian knotweed	2400	2519	0.1	90	0.00207	2
	Canada thistle	1	519	0.5			3
	Scotch broom	1	519	0.5			1
	Scotch broom	1400	1709	0.3			1
Summary		**1**	**2519**	**0.9**	**90**	**0.00207**	
Charley Creek Road	Bohemian knotweed	**1**	**769**	**0.8**	**100**	**0.00230**	**3**
Chicken Coop Road	Bohemian knotweed	1	369	0.4	0	0	1
	Tansy ragwort	370	1519	0.6	264	0.00606	5
Summary		**1**	**1519**	**1.0**	**264**	**0.00606**	**6**
Cook Road	Canada thistle	**1**	**259**	**0.3**			1
Corriea Road	Poison hemlock	**250**	**849**	**0.6**	**800**	**0.01837**	1
Dan Kelly Road	Bohemian knotweed	1250	3179	1.9	200	0.00459	1
	Tansy ragwort	1	669	0.7	6	0.00014	1
Summary		**1**	**3179**	**2.6**	**206**	**0.00473**	**2**
Deer Park Road	Herb Robert	4820	8739	3.9	1600	0.03673	1
	Scotch broom	4820	8739	3.9	1600	0.03673	2
	Tansy ragwort	250	369	2.3	481	0.01104	12
Summary		**250**	**8739**	**6.2**	**3681**	**0.08450**	**15**
Diamond Point Road	Tansy ragwort	**1**	**519**	**0.9**	**220**	**0.00505**	**8**
Discovery View Drive	Tansy ragwort	**240**	**449**	**0.1**			**2**
E East Beach Road	Meadow knapweed	1	119	0.2	13201	0.30305	17
	Scotch broom	1	119	0.1			1
Summary		**1**	**119**	**0.2**	**13201**	**0.30305**	**18**
E East Lyre River Road	Herb Robert	1	619	0.6	309	0.00709	3
	Meadow knapweed	1	619	0.6	1746	0.04008	14
	Tansy ragwort	1	619	0.6	30	0.00069	1
Summary		**1**	**619**	**0.6**	**2085**	**0.04787**	**18**
E East Sequim Bay Road	Tansy ragwort	**1**	**779**	**0.8**			3
Easterly Road	Meadow knapweed	**1**	**449**	**0.4**	**0**	**0**	**1**
E Runnion Road	Scotch broom	1	259	0.3	9	0.00021	1
	Spotted knapweed	1	259	0.2	1500	0.03444	2
Summary		**1**	**259**	**0.2**	**1509**	**0.03464**	**3**
Eden Valley Road	Fuller's teasel	1	289	0.8	202	0.00464	3
	Herb Robert	290	1389	0.9	120	0.00275	1
	Tansy ragwort	1	289	0.4	30	0.00069	1
Summary		**1**	**1389**	**1.7**	**352**	**0.00808**	**5**
Elwha River Road	Meadow knapweed	**100**	**749**	**0.4**	**13**	**0.00030**	**3**
Farrington Road	Meadow knapweed	670	899	0.3	250	0.00574	3
	Tansy ragwort	1	669	0.5	1604	0.03682	4

Road	Weed	Min Address	Max Address	Miles	Area (ft^2)	Area (acres)	# Patches
Summary		**1**	**669**	**0.8**	**1854**	**0.04256**	**7**
Fisher Cove Road	Meadow knapweed	1	659	0.3	1675	0.03845	12
	Scotch broom	1	659	0.6			1
Summary		**1**	**659**	**0.6**	**1675**	**0.03845**	**13**
Finn Hall Road	Bull thistle	300	1259	0.8			8
	Canada thistle	1	259	0.6			11
Summary		**1**	**1259**	**1.4**			**19**
Fleming Drive	Tansy ragwort	**90**	**319**	**0.2**	**34**	**0.00078**	**4**
Gasman Road	Tansy ragwort	**430**	**549**	**0.1**	**2**	**0.00005**	**2**
Gehrke Road	Canada thistle	1	349	0.3			2
	Scotch broom	1	349	0.3			1
Summary		**1**	**349**	**0.3**			**3**
Glass Road	Bohemian knotweed	**1190**	**2209**	**1.0**			**1**
Gossett Road	Meadow knapweed	**1**	**529**	**0.5**	**172**	**0.00395**	**5**
Gunn Road	Scotch broom	**1**	**119**	**0.1**			**1**
Happy Valley Road	Fuller's teasel	3100	3349	0.2	1400	0.03214	3
	Meadow knapweed	400	819	0.4	42341	0.97202	22
	Scotch broom	4730	5199	0.5	3000	0.06887	1
	Spotted knapweed	2270	2669	0.2	1374	0.03154	13
	Tansy ragwort	2970	3099	0.1	2	0.00005	1
Summary		**400**	**5199**	**1.3**	**48117**	**1.10461**	**40**
Heckle Road	Herb Robert	1	219	0.2	30	0.00069	1
	Scotch broom	1	219	0.2	16	0.00037	4
Summary		**1**	**219**	**0.2**	**46**	**0.00106**	**5**
Henry Boyd Road	Bohemian knotweed	**330**	**439**	**0.1**	**750**	**0.01722**	**1**
Heuhslein Road	Bull thistle	260	639	0.5			5
	Canada thistle	1	259	0.4			9
Summary		**1**	**259**	0.4			**14**
Hoko-Ozette Road	Bohemian knotweed	**1**	**9199**	**9.2**	**300**	**0.00689**	**1**
Hooker Road	Poison hemlock	**140**	**249**	**0.1**	**0**	**0**	**1**
Jamestown Road	Poison hemlock	**1**	**239**	**0.2**	**0**	**0**	**1**
Jimmy Come Lately Road	Meadow knapweed	**1**	**459**	**0.5**	**20**	**0.00046**	**2**
John Jacobs Road	Spotted knapweed	**1**	**679**	**0.7**	**0**	**0**	**1**
Johnson Creek Road	Meadow knapweed	1	269	0.3	4801	0.11022	5
	Yellow archangel	270	1639	0.8			1
Summary		**1**	**1639**	**1.1**	**4801**	**0.11022**	**6**
Kirner Road	Spotted knapweed	**250**	**379**	**0.1**	**4**	**0.00009**	**1**
Kitchen-Dick Road	Bull thistle	1270	1479	0.5			2
	Canada thistle	840	1269	0.6			6

Road	Weed	Min Address	Max Address	Miles	Area (ft^2)	Area (acres)	# Patches
	Fuller's teasel	480	749	0.4	298	0.00684	7
	Meadow knapweed	350	479	0.1	1	0.00002	1
	Scotch broom	1480	2229	0.8			1
	Spotted knapweed	480	749	0.3	153	0.00351	3
Summary		**350**	**1479**	**2.4**	**452**	**0.01038**	**20**
Laird Road	Meadow knapweed	**170**	**659**	**0.3**	**109**	**0.00250**	**5**
Lake Aldwell Road	Meadow knapweed	**1**	**639**	**0.6**	**400**	**0.00918**	**1**
Lake Dawn Road	Orange hawkweed	**1**	**309**	**0.3**	**200**	**0.00459**	**1**
Lewis Road	Bull thistle	500	589	0.2			4
	Canada thistle	350	499	0.2			4
	Scotch broom	890	1059	0.2			1
Summary		**350**	**1029**	**0.6**			**9**
Little River Road	Meadow knapweed	**1**	**3319**	**3.1**	**13575**	**0.31164**	**48**
Lost Mountain Road	Fuller's teasel	3290	4289	1.0	1000	0.02296	1
	Meadow knapweed	1690	2459	0.8	1000	0.02296	2
Summary		**1690**	**4289**	**1.8**	**2000**	**0.04591**	**3**
Lotzgesell Road	Spotted knapweed	**1**	**189**	**0.2**			**1**
Louella Road	Tansy ragwort	**290**	**609**	**0.3**	**20**	**0.00046**	**3**
Lower Elwha Road	Meadow knapweed	1	419	0.3	72	0.00165	6
	Tansy ragwort	1500	1639	0.2	5	0.00011	2
Summary		**1**	**1639**	**0.5**	**77**	**0.00177**	**8**
Lupine Drive	Tansy ragwort	**1**	**439**	**0.4**	**20**	**0.00046**	**2**
Macleay Road	Bull thistle	1	259	0.3			1
	Canada thistle	1	259	0.3			2
Summary		**1**	**259**	**0.3**			**3**
Madrona Way	Tansy ragwort	**1**	**169**	**0.2**	**38**	**0.00087**	**3**
Manzanita Drive	Tansy ragwort	**390**	**569**	**0.2**			**1**
Matson Road	Bull thistle	1	249	0.2			1
	Canada thistle	1	249	0.2			6
	Scotch broom	250	499	0.3			1
Summary		**1**	**499**	**0.5**			**8**
Medsker Road	Yellow archangel	**1**	**509**	**0.5**			**1**
Mount Baker Drive	Meadow knapweed	1	379	0.3			1
	Poison hemlock	1	379	0.3			1
Summary		**1**	**379**	**0.3**			**2**
N Barr Road	Canada thistle	**950**	**1079**	**0.2**			**3**
O'Brien Road	Meadow knapweed	1280	1409	0.1	400	0.00918	1
	Sulfur cinquefoil	1280	1409	0.1	200	0.00459	1
	Tansy ragwort	160	409	0.3	25	0.00057	1

Road	Weed	Min Address	Max Address	Miles	Area (ft^2)	Area (acres)	# Patches
Summary		**160**	**1409**	**0.4**	**625**	**0.01435**	**3**
Old Black Diamond Road	Tansy ragwort	**1**	**269**	**0.2**			**1**
Old Blyn Highway	Tansy ragwort	**2240**	**2539**	**0.3**			**1**
Old Olympic Highway	Bull thistle	2760	2939	0.4			7
	Canada thistle	920	1499	0.5			13
	Field bindweed	4510	5009	0.5	250	0.00574	1
	Meadow knapweed	4510	5009	0.5	13	0.00030	2
	Scotch broom	5770	6269	0.4			3
	Spotted knapweed	5010	5519	0.3	5	0.00011	2
Summary		**920**	**6269**	**2.6**	**268**	**0.00615**	**28**
Olympic Hot Springs Road	Herb Robert	1	239	0.2	200	0.00459	1
	Meadow knapweed	1	239	2.6	23621	0.54226	24
Summary		**1**	**239**	**2.6**	**23821**	**0.54685**	**25**
Palo Alto Road	Fuller's teasel	1590	2159	0.6	1	0.00002	1
	Herb Robert	4490	6479	2.0	90	0.00207	1
	Meadow knapweed	1590	2159	1.5	1573	0.03611	35
	Tansy ragwort	1590	2159	1.1	1883	0.04323	41
Summary		**1590**	**6479**	**3.5**	**3547**	**0.08143**	**78**
Panorama Boulevard	Tansy ragwort	**1**	**169**	**0.2**	**24**	**0.00055**	**2**
Port Williams Road	Tansy ragwort	**278**	**509**	**0.5**	**1**	**0.00002**	**2**
Rhododendron Drive	Tansy ragwort	**600**	**799**	**0.2**	**0**	**0**	**1**
River Road	Meadow knapweed	360	429	0.3	24971	0.57326	7
	Spotted knapweed	360	429	0.3	1685	0.03868	9
Summary		**360**	**429**	**0.3**	**26656**	**0.61194**	**16**
Salal Way	Tansy ragwort	**40**	**329**	**0.3**	**0**	**0**	**1**
Sequim-Dungeness Way	Common fennel	4610	4659	0.1	9	0.00021	1
	Fuller's teasel	4090	4139	0.1	301	0.00691	2
	Meadow knapweed	2260	2509	0.3	0	0	1
	Spotted knapweed	1510	1709	0.2	590	0.01354	3
	Tansy ragwort	3890	4089	0.2	300	0.00689	1
Summary		**1510**	**4659**	**0.6**	**1200**	**0.02755**	**8**
Sherwood Road	Tansy ragwort	**1**	**289**	**0.3**	**266**	**0.00611**	**5**
Shore Road	Bull thistle	670	919	0.2	0	0	1
	Canada thistle	540	609	0.1			3
Summary		**540**	**919**	**0.4**			**4**
Slab Camp Road	Meadow knapweed	1	679	0.7	25	0.00057	1
	Scotch broom	1	679	0.7	500	0.01148	1
	Tansy ragwort	1	679	0.7	4	0.00009	1
Summary		**1**	**679**	**0.7**	**529**	**0.01214**	**3**

Road	Weed	Min Address	Max Address	Miles	Area (ft^2)	Area (acres)	# Patches
S Airport Road	Tansy ragwort	**4000**	**4399**	**0.2**			**3**
S Bean Road	Meadow knapweed	**3750**	**3799**	**0.1**	**176**	**0.00404**	**3**
S Doss Road	Tansy ragwort	**4300**	**5030**	**0.5**	**415**	**0.00953**	**6**
S Mount Angeles Road	Meadow knapweed	4800	5619	0.6	1	0.00002	1
	Tansy ragwort	4300	4730	0.4	16	0.00037	2
Summary		**4300**	**4730**	**1.0**	**17**	**0.00039**	**3**
S South Shore Road	Orange Hawkweed	**1370**	**1519**	**0.2**	**0**	**0**	**3**
Spring Road	Bull thistle	1	29	0.3			2
	Canada thistle	30	559	0.5			2
Summary		**1**	**559**	**0.8**			**4**
Sunshine Avenue	Tansy ragwort	**350**	**429**	**0.1**	**20**	**0.00046**	**1**
Sunshine Plaza	Tansy ragwort	**1**	**129**	**0.1**	**50**	**0.00115**	**1**
Taylor Cut-Off Road	Butterfly Bush	810	1319	0.5	310	0.00712	4
	Poison hemlock	810	1319	0.3	0	0	2
	Tansy ragwort	1740	1919	0.2	4	0.00009	1
Summary		**810**	**1919**	**0.7**	**314**	**0.00721**	**7**
Taylor Ranch Road	Tansy ragwort	**1**	**529**	**0.5**	**90**	**0.00207**	**5**
Thompson Road	Tansy ragwort	**190**	**1299**	**1.1**	**0**	**0**	**2**
Township Line Road	Meadow knapweed	**640**	**729**	**0.1**	**200**	**0.00459**	**1**
TRIPP Road	Orange Hawkweed	**1**	**259**	**0.2**	**500**	**0.01148**	**1**
Turnstone Lane	Spotted knapweed	**180**	**689**	**0.5**			**2**
Vautier Road	Canada thistle	1	279	0.3			2
	Scotch broom	1	279	0.3			1
	Spotted knapweed	510	639	0.1			1
Summary		**1**	**639**	**0.4**			**4**
Vista View Drive	Poison hemlock	**1**	**229**	**0.2**	**150**	**0.00344**	**1**
Ward Road	Yellow Archangel	**420**	**589**	**0.2**			**1**
W Anderson Road	Field bindweed	**1**	**249**	**0.2**	**400**	**0.00918**	**1**
W Edgewood Drive	Meadow knapweed	2100	2299	0.4	3950	0.09068	24
	Tansy ragwort	2100	2299	0.3			1
Summary		**2100**	**2299**	**0.4**	**3950**	**0.09068**	**25**
W Lauridsen Boulevard	Meadow knapweed	**1240**	**1361**	**0.4**	**3511**	**0.08060**	**7**
West Street	Tansy ragwort	**140**	**159**	**0.0**	**75**	**0.00172**	**1**
W Washington Street	Spotted knapweed	**1500**	**1699**	**0.3**			**4**
W West Lake Pleasant Road	Bohemian knotweed	440	629	3.6	4870	0.11180	9
	Herb Robert	630	4729	4.0			1
	Yellow Flag Iris	630	4729	4.0	80	0.00184	2
Summary		**440**	**4729**	**7.7**	**4950**	**0.11364**	**12**

Road	Weed	Min Address	Max Address	Miles	Area (ft^2)	Area (acres)	# Patches
W West Lyre River Road	Meadow knapweed	**1**	**319**	**0.3**	**8102**	**0.18600**	**20**
W West Sequim Bay Road	Spotted knapweed	1410	1989	0.3	3	0.00007	3
	Tansy ragwort	1410	1989	0.3	1	0.00002	1
Summary		**1410**	**1989**	**0.3**	**4**	**0.00009**	**4**
Whiskey Creek Beach Road	Herb Robert	1	459	0.5	120	0.00275	1
	Meadow knapweed	1	459	0.5	180	0.00413	1
	Tansy ragwort	1	459	0.3	815	0.01871	7
	Yellow flag iris	1	459	0.5	80	0.00184	1
Summary		**1**	**459**	**0.5**	**1195**	**0.02743**	**10**
Wild Currant Way	Scotch broom	**1**	**99**	**0.1**			**1**
Woodcock Road	Bull thistle	1	339	0.2			5
	Canada thistle	340	759	0.3			14
	Meadow knapweed	1950	2269	0.3	1	0.00002	2
	Poison hemlock	1250	1639	0.3	1480	0.03398	5
	Scotch broom	340	759	0.3			4
Summary		**1**	**2269**	**1.1**	**1481**	**0.03400**	**30**
Woods Road	Chicory	1	2839	2.9	400	0.00918	1
	Herb Robert	1	2839	2.9	1420	0.03260	3
	Meadow knapweed	1	2839	2.9	20	0.00046	1
	Tansy ragwort	1	2839	2.9	2928	0.06722	25
Summary		**1**	**2839**	**2.9**	**4768**	**0.10946**	**30**
Grand Summary				**94.7**	**186,619**	**4.28418**	**793**

Appendix J References

Noxious weed list

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Ordinance _____

AN ORDINANCE creating a chapter titled *"Integrated Roadside Weed Management"* located within Clallam County Code, Title 9 – Roads, Highways, and Bridges.

BE IT ORDAINED BY THE BOARD OF CLALLAM COUNTY COMMISSIONERS:

Section 1. Section .010, Purpose, is created to read as follows:

The purpose of this chapter is to aid Clallam County in keeping its roads, including its improved and unimproved right-of-ways, safe and operating at an efficient level of service.

Furthermore, it is the legislative body's intent that Clallam County's departments, employees, and designees have the ability and flexibility to address and combat the spread of noxious weeds in our community.

Integrated roadside weed management should promote desirable vegetation and remove noxious and invasive plant species of special concern, through comprehensive, strategic, environmentally responsible, and cost effective methods.

Nothing in this chapter should be interpreted as a prohibition on the targeted application of herbicides to noxious weeds and non-native, invasive plant species of special concern.

This chapter is subject to applicable federal and state laws as adopted and hereafter amended; and supersedes the Clallam County Roadside Vegetation Management Policy and any subsequent resolutions relating thereto.

Section 2. Section .020, Applicability, is created to read as follow:

The provision of this chapter applies to any Clallam County department, employee, or designee that may perform work within county right-of-ways.

Section 3. Section .030, Definitions is created to read as follows:

For purposes of this section, the following definitions apply:

(1) "Biological control" means using living organisms that suppress the host plant. Insects, diseases, and foraging animals are examples of biological controls.

(2) "Chemical control" means using conventional or natural herbicides to eliminate noxious weeds or additional invasive, non-native plant species that present a special concern within a specified area. It does not mean treatments for general vegetation management.

(3) "Cultural control" means enhancing the vigor of desirable plants which may crowd-out or prevent weed infestations. Hydroseeding or planting low-growing, self-maintaining shrubs are examples of cultural practices.

(4) "Feasible" means a control method or combination thereof that is capable of being carried out or achieving a goal. This includes consideration of such factors as plant biology, site characteristics, scope of the problem, and available resources.

(5) "Integrated Weed Management (IWM) " means a coordinated decision making process that uses the most appropriate weed management methods and strategies, along with a monitoring and evaluation system, to achieve roadside weed management goals and objectives in an environmentally and economically sound manner. It allows for the use of mechanical, biological, cultural, chemical, and prevention control methods.

(6) "Invasive plant" means an introduced, non-native plant that is aggressive and causes economic loss and adverse effects to agricultural, natural and human resources.

(7) Invasive plant of special concern means an invasive plant identified as a threat by the US Department of Agriculture, the Washington Departments of Agriculture and Ecology, or the Washington Invasive Species Council.

(8) "Mechanical, manual control" means cutting or cultivating in a manner to reduce or slow undesirable plant growth (*i.e.*, using hand labor, mowers, graders, and ditching equipment).

(9) "Planning and prevention" means creating design standards that enhance or complement other control methods (such as slope grade within mower reach) and policies or standard operating procedures such as equipment cleaning or weed free material standards that prevent roadside contamination or spread of noxious or non-native invasive species.

(10) "Weeds" means both noxious weeds which are so designated under State law, and additional non-native invasive plants of special concern that have been added to a County specific list of plants targeted for control and elimination.

(11) "Work Plan" means a plan prepared annually by the Clallam County Road Department and approved by Clallam County Noxious Weed Control Board prior to the commencement of seasonal weed management.

Section 4. Section .040, Integrated Roadside Weed Management Plan, is created to read as follows:

The Road Department shall develop and implement an Integrated Roadside Weed Management Plan (hereinafter "IRWM" or "work plan") that will be reviewed annually, and amended as needed, in concert with and approved by the Noxious Weed Control Board.

The IRWM Plan shall contain a list of priority species and must include the Clallam County Noxious Weed List. Other invasive species may be added as resources allow and according to the level of threat posed. The work plan shall also contain provisions for early detection/rapid response (EDRR) that allows additional weeds, locations, and techniques to be added to the work plan as necessary should new infestations of high priority weeds be discovered during the course of the treatment season.

The IRWM Plan shall contain detailed information about departmental practices and standards, including but not limited to:

(1) Location of high-priority weed infestations, sensitive areas, and other areas with special management considerations.

(2) Guidelines and prescriptions for best management practices in dealing with roadside weed problems and opportunities, including planning and prevention measures.

(3) Creation of an outreach and education component including coordinated volunteer opportunities as time and resources allow.

A copy of the IRWM will be maintained by the Road Department and Noxious Weed Control Board.

Section 5. Section .050, Citizen Option, is created to read as follows:

(1) Property owners that do not wish herbicides to be applied to eliminate noxious weeds or other invasive weeds of special concern to road right-of-ways bordering their property may enter into an annual "owner will control" agreement with Clallam County and are allowed to post the front of their property as no spray areas.

(2) Under an "owner will control" agreement, the property owner must undertake specific measures, prescribed within the agreement that will ensure the timely and effective control and reduction of target weed species within the right-of-way.

(3) If the property owner fails to effectively control or reduce targeted weed species as agreed, then Clallam County will issue a single written warning. If the problem persists, after 10 days from when the written warning was sent, then Clallam County reserves the right to void the agreement upon written notice to the property owner.

(4) If any agreement is subsequently voided, Clallam County may proceed with any planned weed control in the right of way.

(5) A property owner may re-apply for a new agreement in a subsequent season; however, the County reserves the right to deny said application if there is a documented history of failure to adhere to the terms of such agreements or history of voided agreements.

ADOPTED this _____ day of _____ 201_

BOARD OF CLALLAM COUNTY COMMISSIONERS

_____

_____Chair

_____

ATTEST:

_____ _____

Trish Holden, CMC, Clerk of the Board

WASHINGTON STATE
RECREATION AND CONSERVATION OFFICE
Washington Invasive
Species Council

Washington Invasive Species Council Briefing Memo

Meeting Date: March 3rd, 2016

Title: Don't Let it Loose Campaign

Summary: Proposal on how to proceed with planning of a regional "Don't Let it Loose" campaign

Background

On December 17th Raquel met with invasive species coordinators from Oregon, Idaho and Montana to discuss components of a regional "Don't let it Loose" campaign. Regional coordinators are supportive of a joint effort adopting a logo, website and pet store outreach model developed by Montana. On January 14th 2016 a WISC subgroup met to discuss how to proceed with planning of a regional "Don't let it Loose" campaign. Raquel walked the group through existing regional resources and the Montana outreach model. The work group included:

Lizbeth Seebacher, Department of Ecology
John Gamon, Department of Natural Resources
Allen Pleus, Department of Fish and Wildlife

Campaign Objective

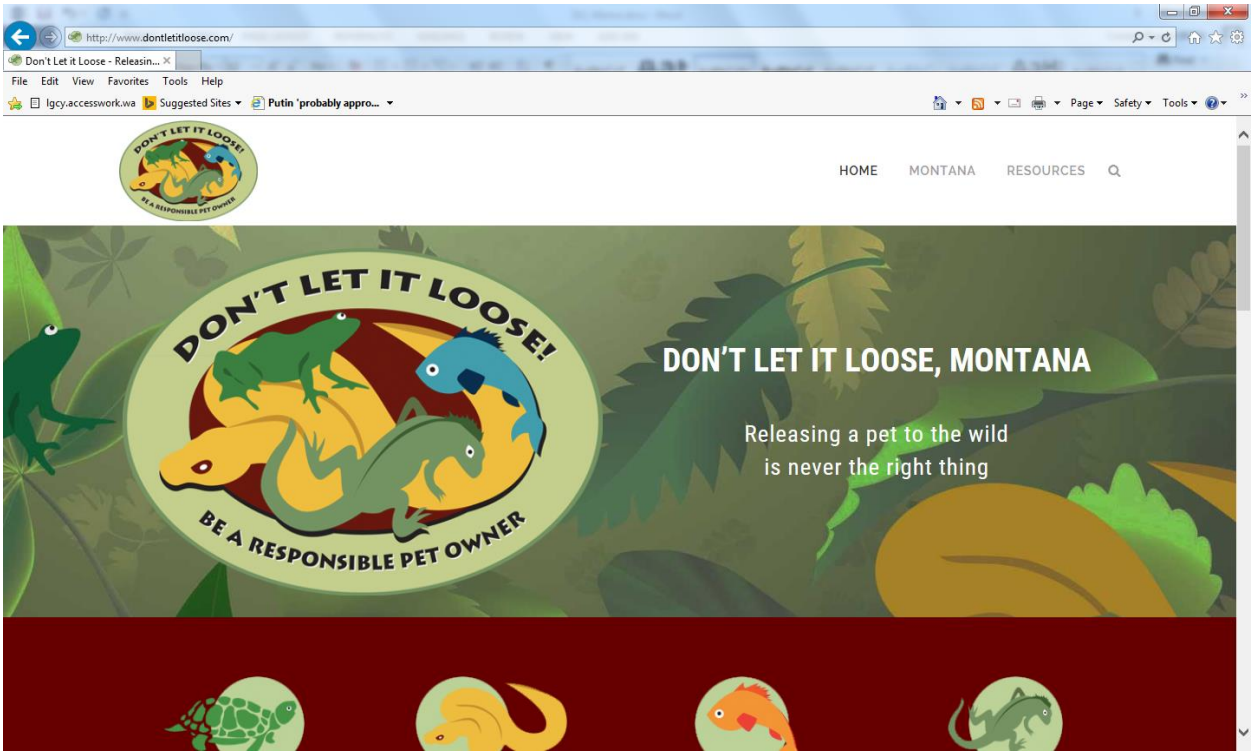
The objective of this regional campaign is to increase public awareness to the impacts of releasing non-native aquarium pets; including aquatic plants and animals, reptiles, insects and rabbits. The campaign will target pet owners, pet stores, the general public and K-12 classrooms. The campaign will be broken into two pahses; one which focuses on legally-imported non-native species and one which focuses on illegally-aquired non-native species.

Phase 1

Phase 1 will include outreach to pet stores, the pet trade industry and K-12 classrooms. It will focus on disposal of legally imported non-native pets (goldfish, bullfrog, etc.). The campaign will utilize a website developed by the State of Montana which is set up as a regional website. A Washington State tab will be created on that website and will direct the pet owners to resources in our state where they can safely dispose of unwanted pets. We will use the Montana pet store outreach model as well, which provides materials to pet stores with the "Don't let it Loose" logo on them (fish bags, etc.) as well as brochures on how to safely dispose of pets. More information on the Montana website and outreach resources can be found at www.dontletitloose.org.

WASHINGTON STATE
RECREATION AND CONSERVATION OFFICE
Washington Invasive
Species Council

Washington Invasive Species Council Briefing Memo



Phase 2
The second phase of this project will be focused on disposal of illegally imported species (african clawed frog, non-native crayfish, etc.). An "amnesty" program will be developed to allow people to safely dispose of illegally imported invasives without being ticketed.

Timeline

March 3rd 2016	The Don't let it Loose Workgroup will present this proposal to the rest of the WISC at our quarterly meeting
May 24th – 25th 2016	Raquel will meet with regional ISC coordinators to finalize outreach campaign details.
September 2016	Deadline for farmbill funding
Febrauary 2017	Farmbill notification

FACT SHEET FOR THE
DRAFT AQUATIC INVASIVE SPECIES MANAGEMENT
NPDES GENERAL PERMIT

DEPARTMENT OF ECOLOGY

MAY 18, 2016

EXECUTIVE SUMMARY

This fact sheet is a companion document to the National Pollutant Discharge Elimination System (NPDES) ***General Permit***[1] for management of Aquatic Invasive Species. It explains the nature of the proposed ***discharge***, the Washington State Department of Ecology's (Ecology) decisions on limiting ***pollutants*** in the receiving water, and the regulatory and technical basis for these decisions.

Ecology has tentatively determined to issue a permit to allow the use of ***algaecides***, ***herbicides***, ***insecticides***, ***molluscicides***, ***piscicides*** and any other chemical or appropriate product to ***surface waters of the state of Washington*** for the purposes of managing ***nonnative invasive*** aquatic animals and nonnative invasive marine ***algae***. The permit ***allows*** short-term toxicity to aquatic ***organisms*** to perform essential activities that protect beneficial uses of the ***waters of the state*** from the impacts of these species.

Since the *Headwaters, Inc. v. Talent Irrigation District* ninth circuit court decision, Ecology has maintained that in order to discharge chemicals to waters of the state, coverage under an NPDES permit is required. Ecology has issued general and ***individual*** NPDES permits for discharges of aquatic pesticides since 2002. The Sixth Circuit Court recently ruled in *National Cotton Council et al. v. EPA* that the discharge of ***pesticides*** and their residues to waters of the state requires NPDES coverage.

Ecology may change the proposed terms, limits, and conditions contained in the draft permit, based upon written public comments it receives and testimony provided at public hearings. The draft permit does not authorize a violation of surface water quality standards, or any other applicable state or federal regulations. Ecology may require any person seeking coverage under this permit to obtain coverage under an ***individual permit*** instead.

Ecology will consider any person who applies control chemicals to surface water who is not covered under this general permit, another applicable general permit, an applicable individual permit, or a state ***experimental use permit*** to be operating without a discharge permit and subject to potential enforcement action. Exceptions include those discharges identified in Aquatic Invasive Species Management Permit Condition S.1. B.

Ecology proposes to issue this new general permit for aquatic invasive organisms so that the applicators of chemicals and other control products to manage these species will comply with the Federal Clean Water Act and with RCW 90.48.080. The ***Permittee*** must monitor (depending on the type of chemical application), notify the public, post signs at treatment sites, and provide annual reports to Ecology.

[1] The text of the fact sheet contains italicized and bolded words or phrases. These words or phrases are the first usage in this document and are defined in the Glossary, Appendix A.

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INTRODUCTION

Since 2001, and based on the *Headwaters v. Talent Irrigation District* ruling, the Washington State Department of Ecology (Ecology) has maintained that discharges of pesticides to waters of the state require coverage under a National Pollutant Discharge Elimination System (NPDES) permit.

This fact sheet is a companion document to the draft Aquatic Invasive Species Management NPDES Permit and provides the legal and technical basis for permit issuance (WAC 173-226-110). Ecology proposes to issue a general permit to allow the use of chemicals (e.g. algaecides, herbicides, insecticides, molluscicides, piscicides and other chemicals or appropriate products) to manage nonnative aquatic invasive animals and nonnative invasive marine algae (herein after referred to as aquatic invasive species).

Ecology determined it was appropriate to issue a general permit for these species because:

- Aquatic invasive species management has a statewide scope.
- The activities for invasive species management are similar at different sites.
- It will facilitate early action and ***rapid response*** to new invaders and invasions.

Ecology may still require individual permits where a proposed activity requires additional guidance, or when an individual Permittee requests an individual permit and Ecology agrees to develop and issue one.

This permit helps Ecology:

- Ensure that applicators use chemicals that have the lowest risk to human health and the environment, but are still effective against the targeted species.
- Mitigate and condition the use of the chemicals.
- Track pesticide rates and use locations.
- Ensure that public notifications and postings occur when waters are treated.
- Monitor the effectiveness of the management activities.
- Allow a rapid response to early infestations

This fact sheet explains the nature of the proposed discharges, Ecology's decisions on limiting the pollutants in the receiving water, and the regulatory and technical basis for these decisions. WAC 173-226-130 specifies public notice of the draft permit, public hearings, comment periods, and public notice of issuance before Ecology can issue the general permit. This fact sheet, application for coverage, and draft permit are available for review (see Appendix B - Public Involvement- for more detail on public notice procedures).

After the public comment period closes, Ecology will summarize and respond to substantive comments. These comments may cause Ecology to revise some of the permit language and requirements. The summary and response to comments will become part of the file for this permit and parties submitting comments will receive a copy of Ecology's response.

Ecology will **not** revise the original fact sheet after it publishes the public notice. Appendix C (Response to Comments) will summarize comments and the resultant changes to the permit.

AQUATIC PESTICIDE LEGAL HISTORY

The Federal Clean Water Act (CWA)

The Federal Clean Water Act (CWA), 33 U.S.C. §§1251 et seq. (1972, with major amendments enacted in 1977 and 1987), established water quality goals for navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the NPDES system of permits, which the EPA administers. The EPA has delegated responsibility for administering the NPDES permit program to the State of Washington. EPA delegated authority to Ecology based on chapter 90.48 RCW that defines Ecology's authority and obligations in administering the NPDES permit program. Ecology does not have the authority to issue NPDES permits to federal facilities or to facilities on Tribal Lands.

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), 7 U.S.C. §§136 et. seq. (1979)

The following excerpt is from the EPA 2010 NPDES Pesticides General Permit Fact Sheet, Sec. I.3. History of Pesticide Application Regulation:

EPA regulates the sale, distribution, and use of pesticides in the U.S. under the statutory framework of the ***Federal Insecticide, Fungicide, and Rodenticide Act*** of 1979, to ensure that when used in conformance with the label, pesticides will not pose unreasonable risks to human health and the environment. All new pesticides must undergo a registration procedure under FIFRA during which EPA assesses a variety of potential human health and environmental effects associated with use of the product. Under FIFRA, EPA is required to consider the effects of pesticides on the environment by determining, among other things, whether a pesticide will perform its intended function without unreasonable adverse effects on the environment, and whether when used in accordance with widespread and commonly recognized practice [the pesticide] will not generally cause unreasonable adverse effects on the environment. 7 U.S.C. 136a(c)(5). In performing this analysis, EPA examines the ingredients of a pesticide, the intended type of application site and directions for use, and supporting scientific studies for human health and environmental effects and exposures. The applicant for registration of the pesticide must provide specific data from tests done according to EPA guidelines.

When EPA approves a pesticide for a particular use, the Agency imposes restrictions through labeling requirements governing such use. The restrictions are intended to ensure that the pesticide serves an intended purpose and avoids unreasonable adverse effects. It is illegal under Section 12(a)(2)(G) of FIFRA to use a registered pesticide in a manner inconsistent with its labeling. States have primary authority under FIFRA to enforce "use" violations, but both the States and EPA have ample authority to prosecute pesticide misuse when it occurs. EPA 2011 NPDES Permit Fact Sheet, Sec. I.3, pg. 5.

After a pesticide has been registered, changes in science, public policy, and pesticide use practices will occur over time. FIFRA, as amended by the Food Quality Protection Act of 1996, mandates a registration review program, under which [EPA] periodically reevaluates pesticides

to make sure that as the ability to assess risk evolves and as policies and practices change, all registered pesticides continue to meet the statutory standard of no unreasonable adverse effects to human health or the environment. [EPA] is implementing the registration review program pursuant to Section 3(g) of FIFRA and will review each registered pesticide every 15 years to determine whether it continues to meet the FIFRA standard for registration. Information on this program is provided at http://www2.epa.gov/pesticide-reevaluation. EPA 2011 NPDES Permit Fact Sheet, Sec. III.3, pg. 95.

FIFRA, as administered by the EPA and the Washington State Department of Agriculture (WSDA), requires that all persons that apply pesticides classified as restricted use be certified according to the provisions of the act, or that they work under the direct supervision of a certified ***applicator***. Commercial and public applicators must demonstrate a practical knowledge of the principles and practices of pest control and safe use of pesticides, which they accomplish by means of a "core" examination. In addition, applicators using or supervising the use of any restricted use pesticides purposefully applied to standing or running water (excluding applicators engaged in public health related activities) must pass an additional exam to demonstrate competency as described in the code of federal regulations as follows:

"Applicators shall demonstrate practical knowledge of the secondary effects which can be caused by improper application rates, incorrect formulations, and faulty application of restricted pesticides used in this category. They shall demonstrate practical knowledge of various water use situations and the potential of downstream effects. Further, they must have practical knowledge concerning potential pesticide effects on plants, fish, birds, beneficial insects, and other organisms which may be present in aquatic environments. These applicators shall demonstrate practical knowledge of the principals of limited area application (40 CFR 171.4)."

Any person wishing to apply pesticides to waters of the state must obtain an aquatic pesticide applicator license from the Washington State Department of Agriculture, or operate under the supervision of a licensed applicator. See http://agr.wa.gov/pestfert/licensinged/ for information on Washington State licensing requirements and testing.

Headwaters, Inc. v. Talent Irrigation District, 243 F.3d 526 (9th Cir. 2001)

In May 1996, as part of routine vegetation management, the Talent Irrigation District (TID) in southern Oregon applied the pesticide acrolein to a system of irrigation canals. Acrolein-treated water discharged into a fish-bearing creek causing a fish kill. Subsequently, Headwaters, Inc. and Oregon Natural Resources Council Action filed a Clean Water Act citizen suit against the TID for applying a pesticide into a system of irrigation canals without an NPDES permit.

The Ninth Circuit in Headwaters held that the applicator should have obtained coverage under an NPDES permit prior to application of aquatic pesticides to an irrigation canal, because the residual acrolein remaining in the waters was a pollutant, and because the pollutant had leaked into waters not intended to be treated. The Ninth Circuit also held that application of the

pesticide in compliance with the FIFRA labeling requirements did not exempt TID from having to obtain an NPDES permit.

Based on the TID court decision, Ecology determined that all pesticide applications to state surface waters required coverage under NPDES permits. Ecology issued its first NPDES general permits for pesticide applications to Washington's surface waters in 2002. Prior to 2001, Ecology regulated the application of aquatic pesticides to most surface waters by issuing administrative orders (called Short-Term Modifications of Water Quality Standards) to Washington-state licensed applicators. Since the Talent decision, there have been further court challenges about the applicability of NPDES permits to aquatic pesticide application as discussed below in this section of the Fact Sheet.

League of Wilderness Defenders et al. v. Forsgren, 309 F.3d 1181 (9th Cir. 2002)

In the 1970's the Douglas fir tussock moth defoliated approximately 700,000 acres of Douglas fir in Idaho, Oregon, and Washington. In response to this outbreak, the United States Forest Service (USFS) developed a system to predict tussock moth outbreaks and control them via aerial spraying of insecticides. Based on its warning system, the USFS predicted an outbreak in 2000-2002 and designed a spraying program.

In 2002, the League of Wilderness Defenders et al. filed suit against the USFS for failing to obtain a NPDES permit under the Clean Water Act for the application of insecticides directly above surface waters. The USFS argued that spray application of insecticides by an airplane was nonpoint pollution and that the discharges fell under federal exemptions (40 CFR 122.3) for silviculture activities.

The Ninth Circuit held that aerial spraying (from an aircraft fitted with tanks) directly to, and over, surface water is a point source of pollution and requires an NPDES permit.

Fairhust v. Hagener, 422 F.3d 1146 (9th Cir. 2005)

The Montana Department of Fish, Wildlife, and Parks (Department) began a ten-year program to reintroduce threatened native westslope cutthroat trout into Cherry Creek. The Department used antimycin A, a piscicide, to remove nonnative trout from Cherry Creek over several years, after which they planned to reintroduce native trout.

The Department was sued under the citizen suit provision of the CWA for failing to obtain an NPDES permit before applying antimycin-A to surface waters. On appeal, the Ninth Circuit concluded that:

"A chemical pesticide applied intentionally, in accordance with a FIFRA label, and with no residue or unintended effect is not 'waste,' and thus not a 'pollutant' for the purposes of the Clean Water Act. Because [the Department's] application of antimycin-A to Cherry Creek was intentional, FIFRA compliant, and without residue or unintended effect, the discharged chemical

was not a pollutant and [the Department] was not required to obtain a NPDES permit." Fairhurst, 422 F.3d at 1152.

Neither the Court nor the EPA offered any guidance regarding which pesticide applications would result in no residue or unintended effect.

Northwest Aquatic Ecosystems v. Ecology, PCHB 05-101 (Feb. 15, 2006)

In February 2006, the Pollution Control Hearings Board (PCHB) issued a final order in PCHB05-101. This case focused on a number of issues, one of which was whether an NPDES permit is required for the use of federally registered pesticides. The PCHB ruled on summary judgment that the Fairhurst decision did not provide a blanket exemption from permit coverage for the application of aquatic pesticides. A pesticide application must meet the conditions identified by the Fairhurst court before Ecology can consider it outside the category of a pollutant under the CWA. The pesticide must:

1. Be applied for a beneficial purpose,
2. Be applied in compliance with FIFRA,
3. Produce no pesticide residue, and
4. Produce no unintended effects.

At hearing, Northwest Aquatic Ecosystems failed to provide any evidence specifically addressing how the use of the aquatic herbicides diquat and endothall on the proposed sites would meet the four conditions identified in Fairhurst. In the absence of such evidence, Fairhurst provided no basis for the PCHB to conclude that an NPDES permit is not required for the proposed pesticide applications.

EPA Final Rule

In November 2006, EPA issued a final rule under the CWA entitled Application of Pesticides to Waters of the United States in Accordance with FIFRA. This rule replaced a draft interpretive statement EPA issued in 2003 concerning the use of pesticides in or around waters of the United States. The rule stated that any pesticide meant for use in or near water, applied in accordance with the FIFRA label, is not a pollutant under the CWA. Therefore, such applications are not subject to NPDES permitting.

After EPA issued the rule, Ecology met with stakeholders to seek input on how it should regulate the use of aquatic pesticides. Ecology also provided the public with a three-week comment period. Stakeholders affiliated with each of the seven affected permits (Mosquito, Noxious Weeds, Aquatic Plant and Algae, Irrigation, Oyster Growers, Fish Management, and Invasive Moth) commented. The consensus of these stakeholders was that Ecology should continue to issue joint NPDES/state waste permits to regulate aquatic pesticide applications.

Because of stakeholder consensus and the need for a permit to implement short-term modifications, Ecology decided that Washington would continue to use NPDES permits as the legal vehicle to regulate the use of aquatic pesticides in and around Washington state waters.

Ecology believes that these permits provide the best protection of water quality, human health, and the environment.

National Cotton Council, et al. v. EPA, 553 F.3d 927 (6th Cir. 2009)

EPA's final rule (described above) was challenged in 11 of the 12 federal circuit courts that are able to hear regulatory arguments. The federal courts combined the petitions into one case at the Sixth Circuit.

The Sixth Circuit vacated the EPA rule, finding that EPA had exempted discharges from the requirement to have a permit that the CWA clearly included within the permit requirement. First, it agreed with the Ninth Circuit's Fairhurst decision that if a chemical pesticide is intentionally applied to water for a beneficial purpose, and leaves no waste or residue after performing its intended purpose, the discharge would not require an NPDES permit. Second, the court found excess pesticides and residues that make their way into waters during and after any pesticide application constitute wastes under the CWA and must have NPDES permit coverage before discharge occurs.

The Sixth Circuit granted EPA a stay on the effective date of this ruling for 24 months to allow the agency to develop an NPDES permit for aquatic pesticide discharges. EPA issued its general permit on October 31, 2011, for the discharge of pesticides to manage aquatic plants and algae, aquatic animals, mosquitoes and flying insects, and forest canopy pests. In Washington, EPA's general permit covers aquatic pesticide activities conducted on federal facilities, on federal lands when federal entities conduct or authorize the treatment, and on tribal facilities and lands. The state regulates aquatic pesticide application to all other lands/waters.

LEGAL BASIS FOR MANAGING INVASIVE SPECIES

Legal Basis for Managing Invasive Species in the United States

Agricultural protection from invasive weeds and animal pests has always been a national priority; only later did the federal government recognize invasive species also as threats to natural areas. In 1899, Congress passed the Rivers and Harbor Act authorizing the United States Army Corps of Engineers (USCOE) to crush, divert, or remove the nonnative invasive weed water hyacinth (*Eichhornia crassipes*) from access areas of the St. Johns River in Florida. In 1958, Congress amended Section 104 of the Rivers and Harbor Act to authorize the USCOE to manage a comprehensive program for control of invasive aquatic plants in United States waters. After zebra mussels invaded the Great Lakes, Congress passed the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990. One of its purposes was to "*prevent and control infestations of the coastal inland waters of the United States by the zebra mussel and other nonindigenous aquatic nuisance species*."

In 1999, President Clinton signed Executive Order 13112 that established a national Invasive Species Council and tasked them with developing a national invasive species plan (plan). The Invasive Species Council was asked to *provide national leadership regarding invasive species, and… encourage planning and action at local, tribal, State, regional, and ecosystem-based*

levels… in cooperation with stakeholders and existing organizations addressing invasive species. Council membership includes the Secretaries and Administrators of 13 federal department and agencies. It is co-chaired by the Secretaries of Commerce, Agriculture, and the Interior.

See http://www.invasivespecies.gov/ to learn more about the national Invasive Species Council and its accomplishments.

Legal Basis for Managing Invasive Species in Washington State

Washington recognized the threat of nonnative invasive species when the legislature established laws in 1881 to protect crops from invasive weeds such as Canada thistle. Washington also established laws to protect agriculture from threats from invasive and native animal pests (pest districts authorized in 1919). The legislature has updated and refined these laws over the years to accommodate new information and changing needs. Although Washingtonians understood the impacts of invasive species on agriculture years ago, it took longer to recognize that invasive species also threaten natural areas. In 1987, the legislature revised chapter 17.10 RCW – the *Noxious Weed Law* - to incorporate noxious weed control in all natural areas including lakes, rivers, and streams. Laws to protect Washington from invasive aquatic animals are more recent and include chapter 77.12 RCW – *Prohibited Animal Species-Infested State Waters* and chapter 77.135 RCW – *INVASIVE SPECIES*.

In 2006, Washington's legislature took a further step in acknowledging the threat that invasive species pose to the state by creating the Invasive Species Council. By doing so, the legislature recognized:

That the land, water, and other resources of Washington are being severely impacted by the invasion of an increasing number of harmful invasive plant and animal species and these impacts are resulting in damage to Washington's environment and causing economic hardships" (RCW 79A.25.300).

Washington's legal system has also recognized that aquatic invasive animals are harmful and (in one case) the PCHB deemed that an "escaped" nonnative animal was a biological pollutant. In May 1997, the PCHB issued a First Order on Summary Judgment finding that escaped farmed Atlantic salmon (nonnative to the Pacific Ocean) are pollutants under the CWA (PCHB -96-257).

The proposed Aquatic Invasive Species Management NPDES permit for Washington State will help Permittees limit the spread and reduce the impacts of aquatic invasive species by allowing for their management with chemical control technologies. The permit also allows rapid response for early invasions. Applicants may obtain permit coverage for aquatic invasive plants and freshwater algae management projects under the Aquatic Noxious Weed Control permit or the Aquatic Plant and Algae Management permit whichever is appropriate for the project.

AQUATIC INVASIVE SPECIES BIOLOGICAL BACKGROUND

The Aquatic Invasive Species Management NPDES Permit allows for management of nonnative invasive organisms (species not indigenous to Washington). Some species already present in

Washington's marine and freshwaters include, but are not limited to, the European green crab, three species of invasive tunicates (sea squirts), several crayfish species, New Zealand mud snails, bullfrogs, and the amur goby. Potential invaders include, but are not limited to, animals such as zebra and quagga mussels, Asian carp, the spiny water flea, and the marine alga *Caulerpa taxifolia*. The fact sheet provides specific species information in subsequent sections of the fact sheet.

Regulators may also consider nonnative genotypes of a native species as not indigenous to an area, although there may be native genotypes of the same species present. *Phragmites australis* (common reed) is an example of a plant species that is indigenous to Washington, but non-indigenous genotypes of *Phragmites australis* are also present. These foreign genotypes may displace the native genotype and other native wetland species.

Ecology has developed the Aquatic Invasive Species Management Permit, in part, to allow for rapid response when potentially devastating organisms such as quagga or zebra mussels are first detected in Washington waters. The permit will also allow treatment of species like invasive tunicates that are already present and where manual or mechanical methods are not the entire solution to managing the invasion.

Why Manage Aquatic Invasive Species?

The introduction of invasive species can cause overwhelming impacts to ecosystems. While effects of individual organisms may vary by species, invasive species often have few predators, diseases, or competitors when introduced outside of their native range. This can allow their populations to explode at the expense of native organisms and existing ecosystems. These nonnative monoculture populations reduce species biodiversity and may lead to species extinction or wipe out a species in an ecosystem.

The economic and environmental impacts of invasive species can be especially devastating. In a 2004 journal article, Cornell University scientists Pimentel et al. estimated that the costs associated with ecological damage and control of invasive species in the United States were **$120 billion per year** and increasing. Invasive species are one of the leading threats to the world's biodiversity. Pimentel et al. (2004) referencing Wilcove et al. 1998, also estimated that invasive species impact nearly half of the plants and animals currently listed as ***Threatened or Endangered*** under the United States Federal Endangered Species Act.

Molnar et al. (*Assessing the Global Threat of Invasive Species to Marine Biodiversity*) concluded that "marine invasive species are a major threat to biodiversity, and have had profound ecological and economic impacts." They also found that marine invasive species had "high levels of invasion in the temperate regions of Europe, North America, and Australia."

Regionally, research by David Lodge (University of Notre Dame) and David Finnoff (University of Wyoming) on the impacts of invasive aquatic species on the Great Lakes regions through introduction by ocean going ships, estimated a median loss of $138 million per year in U.S. waters across multiple ecosystem services (Rothlisberger et. al. 2012). Damaged sectors of the

economy include sport fishing; wildlife viewing, raw water use by municipalities, power plants, industry, and commercial fishing.

Washington depends on its abundant surface water resources for recreation, navigation, transportation, commercial and sport fishing and aquaculture, water supply (drinking water and agriculture), flood control, firefighting, power generation, fish and wildlife habitat, and aesthetics and has much to lose with the introduction of new aquatic invaders.

Specific Examples of Impacts from Invasive Organisms Covered under this NPDES Permit

Example 1. Marine Invaders - Tunicates

Tunicates, more commonly known as sea squirts, are small, sessile (when mature), marine filter-feeding animals. Some species form colonies that resemble sponges, while others are solitary animals (although capable of growing in large dense groups of individuals). Puget Sound has three species of invasive tunicates. Club tunicates (*Styela clava*) are solitary animals that can attach to artificial substrates such as boat hulls and docks. Club tunicates can grow in densities of up to 1,500 animals per square yard and crowd out beneficial marine species such as shellfish. Colonial tunicates (*Didemnum* spp.) exhibit a wide variety of morphological variants that range from long, ropey or beard-like colonies that commonly hang from hard substrates such as docks, lines, and ship hulls; to low, undulating mats with short superficial appendages that encrust and drape rocky seabeds (pebbles, cobbles, boulders, and rock outcrops) (http://woodshole.er.usgs.gov/project-pages/stellwagen/didemnum/). *Ciona savignyi* or transparent sea squirt is a solitary animal that prefers deep water. Scientists are less sure how invasive or problematic this species may be, although *Ciona savignyi* colonized large areas of the sea floor of Hood Canal at one time. Invasive tunicate species affect aquaculture by growing on mussel rafts and lines, overgrowing shellfish areas, and competing with native animals for food.

Aquaculture stands to lose when animals, such as invasive tunicates invade Washington's marine and estuarine waters. In a letter to the Washington Department of Health, the Pacific Coast Shellfish Growers Association stated: *Washington State is the largest producer of farmed shellfish in the country. In 2002… there was approximately 86 million pounds of farmed oysters, Manila clams, geoducks and mussels worth $76 million dollars harvested in the state.*

In a 2006 newsletter, the now superseded Puget Sound Action Team reported:
An invasive form of nonnative club tunicate poses a serious threat to marine habitat and the shellfish industry… In January, the Action Team coordinated an 11th-hour funding request that will enable the Washington Department of Fish and Wildlife to take immediate steps to eradicate known populations of tunicates. While Washington's shellfish industry does not view tunicates as having much impact to their operations now, that could change in the future if tunicates become more widespread.

Examples of harm to the shellfish industry and the fishery from invasive tunicates exist on the east coast of North America. In 2003, scientists discovered that the colonial tunicate *Didemnum* (the same species found in Puget Sound) had colonized a 6.5-square-mile area of the Georges

Banks. Georges Bank is historically New England's primary fishing ground and is highly productive for sea scallops. One year later, scientists estimated that tunicates had infested a 40-square mile area of the seabed of the Georges Bank. In large parts of the affected area, the sea squirts covered 50 percent or more of the seabed.

On Prince Edward Island in eastern Canada, clubbed tunicates have already caused substantial problems at commercial shellfish sites. First discovered on the island in 1998, the dense masses of tunicates have proliferated, growing on lines and other aquaculture gear, smothering and killing the mollusks. More than one million pounds of tunicates are removed from the island each year, yet they continue to come back (http://wdfw.wa.gov/fish/ans/identify/html/index.php?species=styela_clava).

In addition to causing problems with commercial fishing and aquaculture, tunicates can foul the hulls of recreational and commercial vessels, displace native marine species, and encrust marine sanctuaries. In Puget Sound, the Washington Department of Fish and Wildlife (WDFW) surveyed marinas and removed invasive tunicates from infested boats and docks in the summers of 2006 and 2007 using manual removal methods and often relying on volunteer divers.

Because of the extent of the tunicate infestation in Puget Sound, WDFW is considering using chemicals for these invasive organisms. In 2008, WDFW started trials under an experimental use permit from the Washington Department of Agriculture (WSDA) using acetic acid (vinegar) to kill tunicates hanging from floating docks at Maury Island's Dockton Park. In one trial, they directly sprayed the tunicates, in another; they wrapped the float with thick sheets of plastic and pumped in the weak acid. WDFW reported that chemical treatment was not 100 percent effective, but the results were still promising. However, under an experimental use permit, WDFW may only treat one-acre total per year. The Aquatic Invasive Species Management Permit will allow WDFW to expand its treatment acreage that may help facilitate effective treatment of these invasive organisms.

Example 2. Marine Invader – "Killer Algae" Caulerpa taxifolia

Currently, Ecology has not issued any NPDES permits that cover management of marine algae, although treatment of freshwater algae may occur under the Aquatic Plant and Algae Management NPDES permit. Issuing the aquatic invasive species management permit will rectify this situation. *Caulerpa taxifolia*, known as the alga that took over the Mediterranean, is a beautiful, bright green, popular salt-water aquarium specimen. Native to the Caribbean, aquarists developed this variety specifically for the aquarium trade. This alga apparently escaped from an aquarium or somebody deliberately introduced it to the Mediterranean Sea off Monaco about 1984. By 1997, it had spread from an initial small patch to more than 11,000 acres of the northern Mediterranean coast. By 2001, scientists estimated that it had infested 30,000 acres of seafloor. It has caused ecological and economic devastation by overgrowing and eliminating native seaweeds, seagrasses, reefs, and other communities. The invasion of *Caulerpa taxifolia* has harmed tourism and pleasure boating, devastated recreational diving, and had a costly impact on commercial fishing, both by altering the distribution of fish as well as creating a considerable

impediment to net fisheries. This same species (a clone genetically identical to the problem clone in the Mediterranean) has invaded the coasts of California and Australia.

California authorities discovered this "killer algae" in 2000 in a coastal lagoon off Carlsbad in San Diego County. They subsequently discovered a second infestation in Huntington Harbor (about 80 miles away). California took immediate steps to eradicate these infestations. They conducted extensive diver surveys, covered each algal patch with a tarp, and introduced a pesticide (chlorine) under the tarp. This management method proved very effective. After six years (mostly of follow-up surveillance to ensure no new patches occurred) and more than seven million dollars, California declared *Caulerpa taxifolia* eradicated from both sites in July 2007.

To help prevent any new infestations, California passed a law prohibiting the sale, possession, or transport of *Caulerpa taxifolia* and eight other species in the genus *Caulerpa* that have the potential to become invasive. The federal government also listed the invasive Mediterranean strain of *Caulerpa taxifolia* on the federal noxious weed list.

Although scientists consider *Caulerpa taxifolia* to be a tropical species, the National Oceanic and Atmospheric Administration warned, *This seaweed has been observed to survive many months in 50° F water. Given this tolerance to cold and the remarkable adaptability that this species has displayed, it would be wise for even more northern regions to be aware of the damage that introduction of this species could cause to their native ecosystems*. It is because of the behavior of *Caulerpa taxifolia* and the potential of other known and unknown invasive algae species to invade Washington's marine and estuarine waters that Ecology and its advisory groups included nonnative marine algae in the Aquatic Invasive Species management permit.

Example 3. Freshwater Invaders - Zebra and Quagga Mussels

Zebra and quagga mussels in the *Dreissena* genus are small freshwater shellfish named for the striped light and dark areas of their shells. Both species entered the United States from Eurasia, perhaps initially through ballast water discharges into the Great Lakes. Zebra mussels, first observed in 1988 in the Great Lakes, rapidly spread throughout Midwestern and Eastern waters. In 2007, quagga mussels showed up in Lake Mead, Nevada and subsequently more were found in Lake Havasu and Lake Mohave, California and in seven California reservoirs. In January 2008, local authorities discovered zebra mussels in central California and in Pueblo, Colorado (USGS). In September 2008, Utah reported zebra mussel infestations in its waters. These western introductions were likely due to mussel hitchhikers on boats or trailers. WDFW has intercepted and cleaned a number of boats with zebra or quagga mussels being transported through Washington. It is likely just a matter of time until these invasive mussels show up in Washington waters, particularly with established mussel infestations now on the West Coast.

Zebra and quagga mussels attach to hard substrates such as water intake pipes, boat hulls, and even native mussels. They clog pipes, foul boat hulls (and provide an opportunity for boaters to introduce them to new waters), and kill native bivalves. Their sharp-edged shells litter beaches in the millions, cutting the feet of sunbathers and swimmers. Like tunicates, zebra and quagga mussels are filter feeders that primarily remove algae from the water. They grow in great

densities; facilities in the Great Lakes report densities of up to 700,000 individuals per square meter (http://www.100thmeridian.org/zebras.asp). These quantities of filtering animals remove most of the algae, making the water very clear, but also remove the food for other organisms. Larry Dalton, a longtime Utah biologist and Utah's aquatic nuisance species coordinator said, "quagga mussels are the largest single threat to the region's fisheries that he has seen in the last 30 years".

In the United States, congressional researchers estimated that during the 1993-1999 timeframe alone, these mussels cost just the power industry $3.1 billion, with an impact on industries, businesses, and communities of over $5 billion. In 2008, a coalition of water authority officials from Nevada, California, and Arizona asked Congress to direct more than $20 million into projects to research and kill quagga mussels that threaten the region's waterways. In a 2008 letter, California Senator Feinstein (Feinstein 2008) urged the U.S. Department of the Interior to launch a robust federal response to address the growing problem of quagga mussel infestation in Western waterways.

Quagga and zebra mussel introductions on the West Coast are of great concern to the Pacific Northwest. With boat traffic between water bodies, it is inevitable that these mussels will make their way to Washington waters in spite of prevention efforts. At risk are dams on the Columbia and Snake Rivers, thousands of miles of irrigation canals, lakes, fish ladders, municipal water intakes, sewage outfalls, ***threatened and endangered*** salmon, native freshwater bivalves, and even human health. Studies report that invasive mussels encourage the growth of cyanobacteria, which can produce toxins that affect pets, humans, livestock, fish, and wildlife. Zebra mussels will selectively feed on phytoplankton by rejecting less palatable cyanobacterial species. The Final Working Draft of the Columbia River Basin Interagency Invasive Species Response Plan notes: *The economic impact of the zebra and quagga mussels to the hydropower system on the Columbia and Snake Rivers is of particular concern. If introduced into the Columbia River Basin, the mussels could affect all submerged components and conduits of this system, including fish passage facilities, navigation locks, raw water distribution systems for turbine cooling, fire suppression and irrigation, trash racks, diffuser gratings and drains.*

The Washington State Aquatic Nuisance Species Committee Report to the 2008 Legislature states: *The 2007 discovery of quagga mussels in Lake Mead and the rapid spread throughout the Colorado River Basin presents a serious threat to the ecology and economy of Washington State. Quagga mussels develop more rapidly in these warm water lakes than they do in the Great Lakes, and they are able to reproduce nearly year round. These two species have cost the Great Lakes region billions of dollars in damage and control efforts. The ecological damage they have done by altering the ecosystem and crowding out native species cannot be quantified, but is on a catastrophic scale.*

This NPDES permit for aquatic invasive species management will help allow Washington to take immediate action against zebra or quagga mussels should authorities discover them in Washington waters.

CHEMICALS FOR AQUATIC INVASIVE SPECIES MANAGEMENT

Under the Aquatic Invasive Species Management permit, Ecology will allow the use of chemicals or control products in Washington's surface waters for the purpose of eradicating or controlling aquatic invasive species. Except for fish, mosquitoes, and ballast water treatments, EPA labels few products specifically for the management of invasive aquatic animals, particularly chemicals that treat surface water rather than infrastructure. Because of this, ***in addition to permit coverage***, Permittees may also need to pursue an experimental use permit; a special local needs label; or an emergency exemption label for many of the products listed in the permit. Permittees will need to coordinate any additional labeling requirements with WSDA and EPA.

Ecology allows the use of many of the chemicals and products listed in this permit in other aquatic NPDES permits. Other chemicals and products are new to Washington State NPDES permitting and may not have aquatic labels. For example, EPA does not label chlorine for use in the marine environment, but California obtained a modified label to use chlorine for *Caulerpa taxifolia* eradication. California initially used a five percent chlorine solution under tarps to treat the alga, but later modified the procedure to use a solid form of chlorine.

WDFW used a similar technique to treat the marine tunicate *Didemnum* in the Edmonds marine sanctuary using acetic acid instead of chlorine. Because of the shortage of labeled products, invasive species managers have become creative in their use of chemicals and other products in their effort to thwart the spread of and to manage established population of these species.

Ecology proposes to include the chemicals or products listed below in the draft Aquatic Invasive Species Management Permit. Ecology provides an overview, mitigations, and references for each chemical or product in a non-project Aquatic Invasive Species Environmental Impact Statement (EIS), the State Environmental Policy Act (SEPA) document for this permit. The chemicals include:

- Sodium chloride for marine and freshwater application
- Potassium chloride for marine and freshwater application
- Chlorine compounds including chlorine dioxide, sodium chlorite, sodium hypochlorite, and calcium hypochlorite for marine and freshwater application
- Acetic acid for marine and freshwater application
- Calcium hydroxide/oxide (lime) and carbon dioxide for marine and freshwater application
- Rotenone for freshwater application
- Potassium permanganate ($KMnO_4$) for marine and freshwater application
- Endothall (e.g., Hydrothol 191™): mono(N,N-dimethylalkyalmine) salt of 7-oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid for freshwater application
- Sodium carbonate peroxyhydrate for freshwater application
- Methoprene for marine and freshwater application
- Chelated copper compounds for freshwater application
- *Pseudomonas fluorescens* strain CLO145

- Heating/cooling (temperature alteration) for marine and freshwater application

REGULATORY INFORMATION

Regulatory Pollution Reduction Requirements

Federal and state regulations require that effluent limits in an NPDES permit must be either technology-or-water-quality-based.

- Technology-based limitations are based upon the methods available to treat specific pollutants. Technology-based limits are set by EPA and published as a regulation or Ecology develops the limit on a case-by-case basis (40 CFR 125.3, and chapter 173-220 WAC).
- Water quality-based limits are calculated so that the effluent will comply with the Surface Water Quality Standards (chapter 173-201A WAC), Ground Water Standards (chapter 173-200 WAC), Sediment Quality Standards (chapter 173-204 WAC) or the National Toxics Rule (40 CFR 131.36).
- Ecology must apply the more stringent of these limits to each parameter of concern. These limits are described below.

Technology-Based Water Quality Protection Requirements

Sections 301, 302, 306, and 307 of the CWA establish discharge standards, prohibitions, and limits based on pollution control technologies. These technology-based limits are "best practical control technology" (BPT), "best available technology economically achievable" (BAT), and "best conventional pollutant control technology economically achievable" (BCT). Permit writers may also determine compliance with BPT/BAT/BCT using their "best professional judgment" (BPJ).

Washington has similar technology-based limits that are described as "***all known, available, and reasonable methods of control, prevention, and treatment***" (***AKART***) methods. State law refers to AKART under RCW 90.48.010, RCW 90.48.520, 90.52.040, and RCW 90.54.020. The federal technology-based limits and AKART are similar but not equivalent. Ecology may establish AKART:

- For an industrial category or for an individual permit on a case-by-case basis.
- That is more stringent than federal regulations.
- That includes Best Management Practices (BMP's) such as prevention and control methods (i.e. waste minimization, waste/source reduction, or reduction in total contaminant releases to the environment).

Ecology and EPA concur that, historically, most discharge permits have determined AKART as equivalent to BPJ determinations.

Historically, EPA has regulated the pesticide application industry under FIFRA. EPA developed label use requirements to regulate the use of pesticides. EPA also requires the pesticide manufacturer to register each pesticide, provide evidence that the pesticide will work as promised, and minimize unacceptable environmental harm.

The Pesticide Management Division of WSDA ensures that applicators use pesticides legally and safely in Washington. WSDA registers pesticides (in addition to EPA registration); licenses pesticide applicators, dealers and consultants; investigates complaints; maintains a registry of pesticide sensitive individuals; and administers a waste pesticide collection program. These duties are performed under the authority of the Washington Pesticide Control Act (15.58 RCW), the Washington Pesticide Application Act (17.21 RCW), the General Pesticide Rules (WAC 16-228), the Worker Protection Standard (WAC 16-233) and a number of pesticide and/or county specific regulations (http://agr.wa.gov/PestFert/Pesticides/default.htm).

The standards for environmental protection are different between the CWA and FIFRA. Because of the *National Cotton Council, et al. v. EPA* court decision, in 2011, EPA regulates the application of aquatic pesticides under a general NPDES permit. EPA has developed a permit for non-delegated states (four states), federal lands, and Indian lands. EPA expects all delegated states to develop their own NPDES permits for aquatic pesticide application to comply with the federal court decision. The US Supreme Court turned down an appeal request to this decision, so in 2011 all aquatic pesticide applications must occur under NPDES permits.

It is Ecology's intent that this general permit will authorize aquatic invasive species management in a manner that complies with all federal and state requirements. Since 2002, Ecology has regulated aquatic pesticide application under general and individual NPDES permits. The Aquatic Invasive Species general permit is a general aquatic pesticide permit and authorizes aquatic invasive species control activities in a manner that complies with federal and state requirements.

All wastewater discharge permits issued by Ecology must incorporate requirements to implement reasonable prevention, treatment, and control of pollutants. This permit proposes treatment limitations that limit ***treatment areas*** within a given water body. Permittees may only use some chemicals in a contained situation such as under a tarpaulin or behind a barrier. Compliance with the FIFRA label further limits the overuse of products and helps protect non-targeted organisms.

Ecology acknowledges that applicators could treat the pollutants addressed in this permit only with great difficulty due to the diffuse nature and low concentrations that exist after the pesticides have become waste. The *Headwaters, Inc, v. Talent* ruling established that aquatic pesticides become waste in the water after the pesticide has performed its intended action and the target organisms are controlled or if excess pesticide is present during treatment. Applicators may need to treat waters where chemical residues threaten to cause unacceptable environmental harm in some situations, but not routinely. The permit requires applicators to neutralize some of the chemicals after they have performed their intended action.

Integrated Pest Management (IPM)

State agencies in Washington with pest control responsibilities must implement the principles of IPM. In the Washington Pesticide Control Act, RCW 17.15, the legislature established that

prevention of pollution is reasonable only in the context of an IPM plan. IPM plan's require the investigation of all control options, but do not require non-chemical pest controls as the preferred option. Most invasive species control strategies include a combination of control methods.

The Aquatic Invasive Species Management Permit requires that the Permittee develop or ***adopt*** an Ecology-approved adaptive management plan that incorporates IPM principles for any aquatic invasive organism treated under the permit. Permittees must submit a copy of their plan to Ecology no later than 18 months after starting initial treatment of that organism or category of organisms. The preferred alternative in the draft Environmental Impact Statement (EIS) is an integrated pest management approach that incorporates principles of adaptive management. The EIS provides guidance on developing such plans.

Experimental Use Permits

Entities operating under WSDA-issued experimental use permits (WSEUP) do not need coverage under this permit. WSDA requires WSEUP for all research experiments involving pesticides that are not federally registered or for uses not allowed on the federally registered pesticide label. WSDA experimental use permits limit the amount of an experimental use pesticide that a Permittee can distribute or use for testing purposes. WSDA grants experimental use permits for gathering data in support of registration under FIFRA Section (3) or Section 24(c). In most situations, only a state WSEUP is required for the use of an experimental pesticide.

When a proponent conducts a small-scale test on more than one surface acre of water per pest, it must obtain a federal experimental use permit in addition to a state permit. Any person may apply to the EPA for a federal experimental use permit for pesticides. Federal EUPs are usually valid for only one year. Applicants holding a federal experimental use permit must also apply for and obtain a state experimental use permit before initiating any shipment or use of the pesticide in Washington. Ecology requires coverage under the Aquatic Invasive Species Management Permit for applicants operating under a federal experimental use permit.

Water Quality-Based Requirements

Surface Water Quality-Based Effluent Limits

The Washington State Surface Water Quality Standards (chapter 173-201A WAC) were designed to protect existing water quality and preserve the beneficial uses of Washington's surface waters. Waste discharge permits must include conditions that ensure the discharge will meet established surface water quality standards (WAC 173-201A-510). Water quality-based effluent limits may be based on an individual waste load allocation or on a waste load allocation developed during a basin wide total maximum daily loading study (TMDL).

Ecology conditions NPDES and waste discharge permits in such a manner that authorized discharges meet water quality standards. The characteristic beneficial uses of surface waters include, but are not limited to, the following: domestic, industrial and agricultural water supply; stock watering; the spawning, rearing, migration and harvesting of fish; the spawning, rearing

and harvesting of shellfish; wildlife habitat; recreation (primary contact, sport fishing, boating, and aesthetic enjoyment of nature); commerce; aesthetics and navigation.

Numeric Criteria for the Protection of Aquatic Life and Recreation

Numeric water quality criteria are published in the Water Quality Standards for Surface Waters (chapter 173-201A WAC). They specify the levels of pollutants allowed in receiving water to protect aquatic life and recreation in and on the water. Ecology uses numeric criteria along with chemical and physical data for the wastewater and receiving water to derive effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limits, the discharge must meet the water quality-based limits.

Numeric Criteria for the Protection of Aquatic Life and Recreation

The EPA has published 91 numeric water quality criteria for the protection of human health that are applicable to dischargers in Washington State (40 CFR 131.36). EPA designed these criteria to protect humans from exposure to pollutants linked to cancer and other diseases, based on consuming fish and shellfish and drinking contaminated surface waters. The Water Quality Standards also include radionuclide criteria to protect humans from the effects of radioactive substances.

Narrative Criteria

Narrative water quality criteria (e.g. WAC 173-201A-240(1); 2006) limit the toxic, radioactive, or other deleterious material concentrations that may be discharged to levels below those which have the potential to:

- Adversely affect designated water uses.
- Cause acute or chronic toxicity to biota.
- Impair aesthetic values
- Adversely affect human heath

Narrative criteria are statements that describe the desired water quality goal, such as waters being "free from" pollutants such as oil and scum, color and odor, and other substances that can harm people and fish. These criteria are used for pollutants for which numeric criteria are difficult to specify, such as those that offend the senses (e.g., color and odor). Narrative criteria protect the specific designated uses of all freshwaters (WAC 173-201-A-200, 2006) and of all marine waters (WAC 173-201A-210; 2006) in the State of Washington.

Antidegradation

The purpose of Washington's Antidegradation Policy (WAC 173-201A-300-330; 2006) is to:

- Restore and maintain the highest possible quality of the surface waters of Washington.
- Describe situations under which water quality may be lowered from its current condition.
- Apply to human activities that are likely to have an impact on the water quality of surface water.
- Ensure that all human activities likely to contribute to a lowering of water quality, at a minimum, apply all known, available, and reasonable methods of prevention, control, and treatment (AKART).

- Apply three Tiers of protection (described below) for surface waters of the state.

Tier I ensures existing and designated uses are maintained and protected and applies to all waters and all sources of pollution. Tier II ensures that dischargers do not degrade waters of a higher quality than the criteria assigned unless such lowering of water quality is necessary and in the overriding public interest. Tier II applies only to a specific list of polluting activities. Tier III prevents the degradation of waters formally listed as "outstanding resource waters" and applies to all sources of pollution.

WAC 173-201A-320(6) describes how Ecology implements Tier I and II antidegradation in general permits. All Permittees covered under the general permit must comply with the provisions of Tier 1. Ecology determined that the permit does not cover discharges to Tier III waters.

The water quality standards at WAC 173-201A-320(6) describe how Ecology should conduct an antidegradation Tier II analysis when it issues NPDES general permits. This section of the rule requires Ecology to:

- Use the information collected, for implementation of the permit, to revise the permit or program requirements.
- Review and refine management and control programs in cycles not to exceed five years or the period of permit reissuance.
- Include a plan that describes how Ecology will obtain and use information to ensure full compliance with water quality standards. Ecology must develop and document the plan in advance of permit or program approval.

Although the antidegradation requirements for general permits state the individual actions covered under a general permit do not need to go through independent Tier II reviews, Ecology considers it important that the public have the opportunity to weigh in on whether individual actions are in the overriding public interest. The antidegradation rule establishes a refutable presumption that they do, but only through a public notice of intent to provide coverage and expected compliance with antidegradation does the general public have an opportunity to question individual actions. Thus, facilities must publish requests for coverage in a local paper. Currently public notices must include:

- A statement that the applicant is seeking coverage under the Aquatic Invasive Species Management General Permit.
- The name, address, and phone number of the applicant.
- The identity of the water body proposed for treatment.
- A list of products planned for use.
- The statement: "Any person desiring to present their views to the Department of Ecology regarding this application shall do so in writing within 30 days of the last date of publication of this notice. Comments must be submitted to the Department of Ecology. Any person interested in the Department's action on the application may notify the Department of interest within 30 days of the last date of publication of this notice."

This fact sheet describes how the permit and control program meets the antidegradation requirement.

Evaluation of Surface Water Quality-Based Effluent Limits for Numerical Criteria

Ecology made a reasonable potential determination on the application of chemicals approved for use in the draft permit based upon its knowledge of invasive species control methods, available EPA and Ecology risk assessment documents, published research, and information in non-peer reviewed publications about chemical properties. It based this decision using available information and prepared an Environmental Impact Statement as a companion document to the Aquatic Invasive Species Management Permit. Ecology has determined that if dischargers properly apply and handle control chemicals in accordance with the terms and conditions of the general permit, the aquatic invasive species control activities will:

- Comply with state water quality standards.
- Maintain and protect the existing and designated used of the surface waters of the State.
- Protect human health.

New information regarding previously unknown environmental and human health risks may cause Ecology to reopen the general permit.

Short-Term Water Quality Modification Provisions

The short-term water quality modification provisions of the draft permit allows the discharges authorized by the general permit to cause a temporary diminishment of some designated beneficial uses while it alters the water body to remove aquatic invasive species.

The activities authorized by this general permit do not have a reasonable potential to cause a violation of state Water Quality Standards (chapter 173-201A WAC) so long as Ecology allows the activities under the short-term water quality modification provision. The water quality modification provides for an exception to meeting certain provisions of the state water quality standards, such as meeting all beneficial uses all the time. Activities covered under this permit are allocated a temporary zone of impact on beneficial uses, but the impact must be transient (hours or days), and must allow for full restoration of water quality and protection of beneficial uses upon project completion. The conditions of this permit constitute the requirements of a short-term water quality modification.

A short-term exceedance only applies to short lived (hours or days) impairments, but short-term exceedances may occur periodically throughout the five-year permit term. Short-term exceedances may also extend over the five-year life span of the permit (long-term exceedance) provided the Permittee satisfies the requirements of WAC 173-201A-410. The permit, fact sheet, SEPA documents, NOI and state agency aquatic invasive species response documents represent fulfillment of the plan requirement and development through a public process as required by WAC 173-201A-410 for long term exceedances.

Washington's Water Quality Standards now include 91 numeric health-based criteria that Ecology must consider when writing NPDES permits. The EPA established these criteria in 1992 in its National Toxics Rule (40 CFR 131.36). Ecology has determined that the Permittee's discharge does not contain chemicals of concern based on existing data or knowledge.

Sediment Quality

The aquatic sediment standards (chapter 173-204 WAC) protect aquatic biota and human health. Under these standards, Ecology may require a Permittee to evaluate the potential for the discharge to cause a violation of sediment standards (WAC 173-204-400). You can obtain additional information about sediments at the Aquatic Lands Cleanup Unit website http://www.ecy.wa.gov/programs/tcp/smu/sediment.html

Ecology has determined through a review of the discharger characteristics and effluent characteristics that this discharge has no reasonable potential to violate the Sediment Management Standards.

Ground Water Quality Standards

The Ground Water Quality Standards, (chapter 173-200 WAC), protect beneficial uses of ground water. Permits issued by Ecology must not allow violations of those standards. This permit does not allow the use of any pesticides expected to contaminate groundwater. In the event there is a concern, Ecology can issue orders requiring groundwater and well monitoring for different pesticides under this permit.

SEPA Compliance

Ecology has developed a non-project EIS to fulfill the SEPA requirements for this permit. Based on this EIS and associated chemical risk assessments, the conditions of this draft permit should satisfy water quality-related SEPA concerns. The draft permit limits and conditions the use of chemicals to mitigate environmental impacts of concern noted in the EIS.

Ecology is proposing a procedural change in how it handles the project level SEPA determination for each permit coverage. A non-project SEPA review of the proposed action has been conducted for activities covered by this draft permit. The non-project SEPA review assesses all of the pesticides allowed for use under the permit and applies to all fresh waters of the state. Ecology will rely upon the non-project SEPA determination to issue permit coverage rather than issuing a SEPA determination for each separate coverage. In a change from the 2011 Permit, applicants no longer fill out a separate SEPA checklist. Instead, the Adaptive Management Plan (Permit Special Condition S.5) provides site-specific project information to supplement Ecology's programmatic SEIS.

Endangered and Sensitive Species

EPA has implemented the Endangered Species Protection Program to identify all pesticides that may cause adverse impacts on threatened/endangered species and to implement measures that will mitigate identified adverse impacts. When an adverse impact is identified, the Endangered

Species Protection Program requires use restrictions to protect these species at the county level. EPA will specify these use restrictions on the product label or by distributing a county specific Endangered Species Protection Bulletin. However, EPA has not labeled many of the chemicals allowed for use in the Permit for aquatic sites. Therefore, the draft permit requires the Permittee to check with WDFW biologists to determine critical habitat areas before using many of chemicals listed in the permit to manage invasive species. General Condition G6 of the permit requires the Permittee to comply with all applicable federal regulations.

At Ecology's request, WDFW biologists have developed work windows for aquatic pesticide permits to include all salmon species, bull trout, and any other sensitive species associated with aquatic habitats (e.g. waterfowl, amphibians, etc.). Ecology has imposed timing restrictions on chemicals expected to have lethal, sub-lethal, or habitat alteration impacts to these species. Ecology further limits the use of some chemicals such as copper until the state and federal fish agencies approve of the treatment. Ecology is trying to balance the impacts of the invasive organisms on the environment with the impacts of the chemical treatment.

Based upon annual reporting of pesticide use and other available information, Ecology may further restrict pesticide use to protect endangered, threatened, candidate and sensitive species such as pacific salmonids.

SPECIAL CONDITIONS

S1. PERMIT COVERAGE

Activities Covered under This Permit

Washington's Water Quality statutes and regulations do not allow the discharge of pollutants to waters of the state without permit coverage (RCW 90.48.080, 90.48.160, 90.48.260, 173-226, 173-201A WAC). Algaecides, herbicides, insecticides, molluscicides, piscicides and any other chemical or product appropriate for aquatic invasive species management are pollutants, and therefore require a discharge permit before application to Washington State surface waters.

This permit regulates the use of chemicals or control products for the management of aquatic invasive species animals and nonnative invasive marine algae in surface waters in Washington State. Ecology limits chemical application to marine and freshwater animals or marine algae:

- Identified in WAC 220-12-090.
- Listed on Washington's Aquatic Nuisance Species Committee (ANS) watch list.
- Listed on the Washington Invasive Species Council's (WISC) management priority list.
- Listed by the United State Fish and Wildlife Service as Injurious Wildlife under the Lacey Act (18 U.S.C. 42; 50 CFR 16).

The permit also regulates the use of chemicals for ***potentially invasive*** aquatic species not listed on the above lists as determined by Ecology in consultation with WDFW, or WDNR, or WSDA, or WISC, or the ANS Committee, or applicable federal agencies.

Activities That May Not Need Coverage Under This Permit

Ecology has determined not to issue coverage for ***retention and detention ponds*** if:

- Ecology regulates its discharge under another permit (such as industrial or municipal stormwater permits) and the permit allows chemical treatment for aquatic pests, or
- There is no discharge to surface waters within two weeks of treatment.

Ecology has determined not to issue coverage for ***constructed water bodies*** or ***upland farm ponds*** if:

- The water bodies are five acres or less in surface area, and
- There is no discharge to surface waters within two weeks of treatment.

Ecology has determined not to issue coverage for seasonally dry ***wetlands*** if:

- The wetland is dry at the time of treatment and for two weeks following treatment, and
- The chemical will not be biologically available when the area is inundated with water.

Ecology believes that the two-week holding time sufficiently allows the dissipation of the product prior to possible discharge to surface waters and that if these conditions are met, the treatment poses no potential to violate the Water Quality Standards for Surface Waters of the State of Washington (chapter 173-201A WAC).

Geographic Area Covered

The draft permit applies to the application of chemicals/products for aquatic invasive species control to surface waters anywhere in the state of Washington where Ecology has authority. Surface waters include lakes, rivers, ponds, streams, inland waters, salt waters, wetlands, and all other surface waters and watercourses within the jurisdiction of the state of Washington (RCW 90.48.020, WAC 173-201A-020 and WAC 173-226-030). Aquatic invasive species have the potential to occur in or near virtually any freshwater, marine, estuarine, wetland, or semi-aquatic site in Washington State. These sites include but are not limited to riparian areas, wetlands, marshes, rivers, year round and seasonal streams, lakes, ponds, wet pastures, brackish areas, estuaries, and marine waters up to 12 miles offshore.

S2. APPLICATION FOR COVERAGE

Who May Apply for Coverage

A definition of "Permittee" is not provided in chapter 90.48 RCW, chapters 173-216, 173-220, or 173-226 WAC, nor is one provided in 40 CFR 122 (EPA NPDES Permit Program) or (State NPDES Permit Programs). Based upon the usage of Permittee in federal and Washington State law, Ecology takes the term "Permittee" to mean "the person or entity that discharges or controls the discharge of pollutants to waters of the state (surface or ground) and holds permit coverage allowing that specific discharge." For the Aquatic Invasive Species Management Permit, Ecology has established that the Permittee is any state government agency conducting invasive species management in surface waters of the state. Examples of state government agencies that may become Permittees under this permit include, but are not limited to WDFW, DNR, and WSDA. Ecology does not issue NPDES coverage to federal agencies.

Ecology developed this permit so that other government entities, non-government entities, or private individuals may cooperate in aquatic invasive species control under the coverage issued to a Washington state agency. The Permittee, if they choose to do so, has the option to contract with other entities or private individuals for management activities. In this respect, this permit will operate similarly to the Aquatic Noxious Weed permit (the Permittee is WSDA). Under the Aquatic Noxious Weed permit, WSDA contracts with individuals and other entities for on-the-ground management of the targeted organism(s). The contracted entities, per individual agreements, can carry out notification, monitoring, reporting, documentation, planning, and other administrative tasks, but it is the responsibility of the Permittee to prepare and submit reports to Ecology. Because it holds permit coverage, the Permittee is liable for any violations of permit conditions and responsibility for permit fees (90.48.465 RCW, chapter 173.224 WAC) associated with coverage under the permit.

How to Obtain Coverage

Applicants must submit a complete application for permit coverage a minimum of 38 days before applying pesticides that result in discharge to waters of the state. The applicant must submit a complete application including a Notice of Intent (NOI). An official who has signature authority (173-226-200 WAC) for the entity applying for permit coverage must sign the NOI. Ecology must receive the complete application for permit coverage on or before the publication date of the first public notice the permit applicant posted in a newspaper of general circulation (173-226-130 WAC). Ecology considers a newspaper of general circulation as the major newspaper publication for a region.

The public has the opportunity to comment on the permit application and the proposed coverage during the 30 days after publication of the second public notice (public comment period). Ecology will consider comments about the applicability of the Permit to the proposed activity received during this period. If Ecology receives no substantive comments, it may issue permit coverage on the 38th day following the first publication of the public notice.

Length of Coverage

Ecology plans to issue the permit for a period of five years, starting on the effective date of the permit (WAC 173-226-330). Coverage will last from the date of coverage to the date of permit expiration, which will be up to 5 years, unless the Permittee terminates coverage by submitting a notice of termination.

S3. DISCHARGE LIMITS

Short-Term Water Quality Modification of Water Quality Standards

In 2006, Ecology updated the Water Quality Standards for Surface Waters of the State of Washington (chapter 173-201A WAC). The standards allow a temporary exceedance of water quality criteria for up to five years (the term of a general permit) provided the Permittee has followed certain guidelines. A short-term exceedance only applies to short lived (hours or days) impairments, but short-term exceedances may occur periodically throughout the five-year permit term. Short-term exceedances may also extend over the five-year life span of the permit (long-term exceedance) provided the Permittee satisfies the requirements of WAC 173-201A-410 (See

also pg 24 - Short-Term Water Quality Modification Provisions). The permit, fact sheet, SEPA documents, NOI and state agency aquatic invasive species response documents represent fulfillment of the plan requirement and development through a public process as required by WAC 173-201A-410 for long term exceedances. Permittees who do not meet these requirements must ensure the short-term exceedance of water quality criteria is limited to only hours or days.

Impaired Water bodies

Ecology periodically reviews water quality data to determine if water bodies meet criteria. Section ***303(d)*** of the CWA requires that waters not meeting criteria undergo an evaluation of the cause and amount of the contaminant. Ecology publishes Total Maximum Daily Load (TMDL) reports which may establish limits on the amounts of pollutants contributors may discharge. Applications to water bodies listed on the 303(d) list have additional limits and conditions imposed upon them. Parameters of concern identified in the permit include phosphorus, dissolved oxygen, copper, temperature, and pH.

Ecology has removed the condition allowing discharge of copper to a waterbody listed as impaired for copper on the 303(d) list of impaired waters as long as the sediment copper concentration is below 110 mg/L. A discharge of copper to a water body listed as impaired for copper cannot be allowed (issuance of permit is prohibited) if the discharge will cause or contribute to a violation of water quality standards (Clean Water Act 122.4(i)).

Chemicals that cause a rapid die-off of animals may trigger release of phosphorus and other nutrients that in turn may trigger cyanobacteria blooms. This may lead to low oxygen conditions developing in the water body. Other chemicals may alter the pH and that may adversely affect aquatic life. The permit identifies and requires mitigation measures that can help prevent further impairment of 303(d)-listed waters.

S4. RESTRICTIONS OF THE APPLICATION OF PRODUCTS

Authorized Discharges

This permit allows the use of chemicals or products identified in the permit; most are regulated under FIFRA, but others are not. Ecology authorizes these discharges in accordance WAC 173-201A-410 and chapter 90.48 RCW. The Aquatic Invasive Species Management Permit does not cover activities that Ecology regulates under other NPDES permits, such as routine fish management using rotenone.

The Permittee must comply with both the pesticide label requirements and the general permit conditions. **Coverage under this general permit does not supersede or preempt federal or state label requirements or any other applicable laws and regulations**. General permit Condition G6 informs the Permittee of this fact.

Chemicals and Products Allowed For Use under this Permit

This permit authorizes and conditions the use of pesticides, chemicals, and products that may be suitable for the management of aquatic invasive animals and marine algae. There are few aquatic pesticides specifically registered for management of these species in surface waters. When EPA

has not labeled a chemical for the use and a Permittee plans to use it as a pesticide, it must seek a special local need or emergency exemption label through WSDA and EPA prior to applying the pesticide to surface waters.

Ecology initially developed a list of chemicals with potential to manage aquatic invasive organisms by conducting its own research and by asking members of its advisory committees, members of the Washington Aquatic Nuisance Species Committee, and people working in the field of invasive species management to suggest potential pesticides, chemicals, or other suitable products. WDFW assigned an employee to research appropriate chemicals and provided this information to Ecology. Ecology also considered any chemicals and products used elsewhere in the world to manage aquatic invasive species.

Once Ecology compiled this list, it eliminated chemicals/products considered too toxic or not likely to be of use by consulting with toxicologists and advisory committee members. While chemicals to manage animals tend to be more toxic than herbicides, Ecology weighed temporary toxicity with long-term effects of the invasive species on the environment. In many cases, short-term environmental impacts from chemical use are less damaging than the long-term ongoing impacts of invasive species. Ecology also requires specific restrictions for the use of chemicals (see Tables 1 and 2 in the draft permit) to limit and mitigate chemical treatment effects.

Ecology has undertaken an independent state risk assessments for most, but not all, of the chemicals used in the Aquatic Plant and Algae Management Permit and the Noxious Weed Control Permit. RCW 90.48.447 requires Ecology to maintain the currency of the information on herbicides and evaluate new herbicides as they become commercially available for the Aquatic Plant Management Program. "The purpose of this act is to allow the use of commercially available herbicides that have been approved by the environmental protection agency and the department of agriculture and subject to rigorous evaluation by the department of ecology through an environmental impact statement for the aquatic plant management program." However, this law is silent on requiring rigorous evaluation by Ecology for other chemical applications (e.g., mosquito management, aquatic invasive species management, etc.)

Ecology does not have independent risk assessments on all of the chemicals used in other aquatic NPDES permits (e.g., products used for mosquito control, invasive moth control, and for management of aquatic plants in irrigation ditches). Some of the products used in these permits are more toxic than the active ingredients allowed for use under the Aquatic Plant and Algae Management permit or the Noxious Weed Control permit.

Due to the urgent need for a permit for aquatic invasive species management, particularly if zebra or quagga mussels enter state waters, and a lack of state resources available to develop state risk assessments, Ecology decided to issue this permit without having independent state risk assessments for **every** chemical in the permit. However, many of the chemicals included in the Aquatic Invasive Species Management Permit have already been independently evaluated through state risk assessments (see http://www.ecy.wa.gov/programs/wq/pesticides/seis/

risk_assess.html). EPA registers others as pesticides for non-aquatic uses. All EPA-registered pesticides have undergone some level of toxicity testing and a federal risk assessment process.

Federal law requires that before selling or distributing a pesticide in the United States, a person or company must obtain registration, or license, from EPA. Before registering a new pesticide or new use for a registered pesticide, EPA must first ensure that the pesticide, when used according to label directions, can be used with a reasonable certainty of no harm to human health and without posing unreasonable risks to the environment. To make such determinations, EPA requires more than 100 different scientific studies and tests from applicants. Where pesticides may be used on food or feed crops, EPA also sets tolerances (maximum pesticide residue levels) for the amount of the pesticide that can legally remain in or on foods.

EPA ensures that each registered pesticide continues to meet the highest standards of safety to protect human health and the environment. The Agency has several programs to ensure the review of registered pesticides, including re-registration, tolerance reassessment, registration review, and special review (http://www.epa.gov/pesticides/regulating/index.htm).

In this permit, Ecology approves active ingredients rather than brand name products; this does not limit Permittees to brand-name products.

Ecology is proposing to remove the active ingredient antimycin A from the list of chemicals authorized for use under permit coverage. Antimycin A, at the time of writing, does not have an EPA approved pesticide label for any use pattern.

Experimental Use Permits

EPA regulates federal EUP's under section 5(f) of FIFRA and WSDA regulates both state and federal EUP's under RCW 15.58.405(3). Entities operating under a state EUP do not need coverage under the Aquatic Invasive Species Management Permit because state EUP's are limited in acreage. However, entities operating under a federal EUP must obtain permit coverage. Federal EUP's typically allow treatment of up to several hundred acres.

Specific Restrictions on the Application of Pesticides

Unless it is an ***emergency***, Ecology requires the Permittee to minimize treatments that restrict public water use during high use holidays (e.g. Memorial Day, July 4, and Labor Day) and on weekends (173-201A-410 WAC). Water use restrictions occurring during those times will disproportionately impact public use of the waters. While situations may occur when this is the only appropriate time to treat, Ecology strongly encourages the Permittee not to treat during these high use times when chemical application may have greater effect on recreational water use.

Tables 1 and 2 identify restrictions on chemicals/products that Ecology imposes (over and above any federal labeling restrictions). Ecology developed these restrictions in consultation with internal and external advisory committees that included toxicology and fish and wildlife experts and from information acquired during the EIS development process.

At Ecology's request, WDFW developed timing windows to protect salmon, steelhead, bull trout, and other sensitive species and habitats (including amphibians and nesting waterfowl) from the effects of aquatic pesticide application. (These timing windows also apply to aquatic pesticide treatments covered under the Aquatic Plant and Algae Management Permit). There are times when chemical applications have little to no impact on sensitive species and WDFW work windows identify these periods for specific water bodies. Not all chemicals are subject to work windows if Ecology does not identify an impact. However, some chemicals are lethal (rotenone) or may cause sub-lethal impacts (copper). In these cases, Tables 1 and 2 clearly identify the chemicals and the applicable timing windows. Even when the chemical is not subject to timing windows, Ecology requires that the Permittee check with WDFW biologists to determine critical habitat areas before treatment.

Ecology imposed recreational and/or swimming restrictions/advisories on some chemicals to protect human health. Any restrictions imposed by Ecology are in addition to any FIFRA label requirements. A restriction is more stringent than an advisory. An advisory recommends that people not recreate in the treated area, but they may choose whether to comply. A restriction means no swimming for a set time after chemical application. A restriction or advisory requires public notification via sign posting (see S.6. Posting and Notification Requirements).

Treatment limitations help mitigate adverse impacts from chemical treatments and Ecology based these limits on the best scientific information available and its best professional judgment.

S5. PLANNING REQUIREMENTS

Ecology believes that IPM plans meet AKART. Ecology based the requirement for adaptive management plans that incorporate integrated pest management principles on:

- Integrated Pest Management Law (chapter 17.15 RCW)
- Water Quality Standards (173-201A-110 WAC)
- The draft Environmental Impact Statement for Aquatic Invasive Species
- Similar planning requirements in the Noxious Weed NPDES permit
- Proposed federal IPM requirements in aquatic pesticide NPDES permits. In the federal NPDES permit for aquatic pesticide application, EPA considers IPM to meet technology-based standards.

S6. POSTING AND NOTIFICATION REQUIREMENTS

Ecology based the posting and notification requirements in the Aquatic Invasive Species Management Permit on similar requirements for posting and notification in the Aquatic Plant and Algae Management NPDES permit and the Noxious Weed Control NPDES permit. Other aquatic pesticide permits issued by Ecology require various levels of public notification. Ecology also considered input from advisory committees, end users, and the public's right to know. Ecology added additional notification over and above notification requirements in other pesticide permits by requiring the Permittee(s) to post treatment information on its website.

S7. MONITORING REQUIREMENTS

Sampling and analytical methods used to meet the monitoring requirements specified in this permit must conform to the latest revision of the Guidelines Establishing Test Procedures for the Analysis of Pollutants contained in 40 CFR Part 136 (or as applicable in 40 CFR subchapters N [Parts 400–471] or O [Parts 501-503]) unless otherwise specified in this permit. Ecology may only specify alternative methods for parameters without limits and for those parameters without an EPA approved test method in 40 CFR Part 136.

All samples must be analyzed by a laboratory registered or accredited under the provisions of Accreditation of Environmental Laboratories, Chapter 173-50 WAC. RCW 90.48.260 gives Ecology the authority to establish inspection, monitoring, entry, and reporting requirements. WAC 173-220-210 gives Ecology the authority to require monitoring of the treated waters to determine the effects of discharges on surface waters of the state. Permittees with coverage under the Permit must monitor the amount of pesticides they use and report this information to Ecology in an annual report (S9.).

Monitoring Plans

The Aquatic Invasive Species Management Permit requires the Permittee to monitor a subset of treated locations each year. At a minimum, the Permittee must monitor treatment effectiveness on the targeted organism. This provides Ecology and the Permittee chemical efficacy information for the targeted species. The Permittee's annual monitoring plan must propose specific monitoring locations and parameters to Ecology. In consultation with the Permittee, Ecology reviews and approves the annual monitoring plan. Permittees submit the results of the previous year's monitoring to Ecology by February 1 of each year.

Monitoring for Specific Chemicals

Ecology requires monitoring for specific parameters when using sodium chloride, potassium chloride, chlorine, acetic acid, calcium hydroxide/oxide, rotenone, copper, or heat/freezing (Tables 3-8). Ecology based these monitoring requirements on similar monitoring requirements in other NPDES pesticide permits or required monitoring for parameters that may be altered by the treatment (e.g., pH).

S8. ROTENONE MONITORING

Ecology based these monitoring requirements on similar monitoring requirements in the NPDES Fisheries Resource Management General Permit (http://www.ecy.wa.gov/programs/wq/pesticides/final_pesticide_permits/fish/fish_index.html). For a discussion of rotenone monitoring requirements please see the Draft Fisheries Resource Management NPDES and State Waste Discharge General Permit Fact Sheet (http://www.ecy.wa.gov/programs/wq/pesticides/final_pesticide_permits/fish/docs/DraftFisheriesManagementFactsheet.pdf).

The use of 60% trout survival in the trout live-box assay and the analytical method allowance for a rotenone limit of 3.75 µg/L or less reflect the LC50 (lethal concentration where 50% of the organisms exposed suffer mortality) for rainbow trout (Bills & Marking 1986).

S9. REPORTING AND RECORDKEEPING REQUIREMENTS

Section S9 of the permit contains specific conditions based on Ecology's authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-226-090).

Annual treatment reports

Permittees meet part of their reporting requirements through annual treatment reporting. The annual report summarizes the amount of each chemical used during the course of each treatment season. It allows Ecology to track how much pesticide is used in Washington for a specific use. Permittees must submit their annual treatment report by February 1 of each year.

Annual monitoring reports

The annual monitoring report (due February 1) summarizes the results of any monitoring identified in the annual monitoring plan (submitted to Ecology on February 1 of each year). Requiring an annual monitoring plan allows the Permittee and Ecology to discuss previous year's results and tailor monitoring to specific monitoring needs.

Records Retention

Applicators must keep all records and documents required for five years. If there is any unresolved litigation regarding the discharge of pollutants by the Permittee, the period of record retention must be extended during the course of the litigation (WAC 173-226-090).

Reporting Permit Violations

WAC 173-226-080 (1)(d) states that a discharge of any pollutant more frequently or at a level in excess of that authorized is a permit violation. Ecology requires that if a Permittee violated the permit conditions, it must take steps to stop and minimize any violations and report those violations to Ecology. For pesticide applications authorized in the Permit, applicators must report violations to the Aquatic Pesticide Permit Manager and the Regional Spills (ERTS Hotline) within 24 hours. This allows Ecology to determine if more action is necessary to mitigate the permit violation.

WAC 173-226-070 allows Ecology to place permit conditions to prevent or control pollutant discharges from plant site run off, spillage or leaks, sludge or waste disposal, or materials handling or storage and allows Ecology to require the use of Best Management Practices (BMPs). BMPs means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of the waters of the state. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. The Permittee must be prepared to mitigate for any potential spills and, in the event of a spill, perform the necessary cleanup, and notify the appropriate Ecology regional office (see RCW 90.48.080, and WAC 173-226-070).

GENERAL CONDITIONS

Ecology bases the General Conditions on state and federal law and regulations.

PERMIT ISSUANCE PROCEDURES

Permit Modifications

Ecology may modify this permit to impose new or modified numerical limitations, if necessary to meet Water Quality Standards for Surface Waters, Sediment Quality Standards, or Water Quality Standards for Ground Waters. Ecology would base any modifications on new information obtained from sources such as inspections, effluent monitoring, or Ecology-approved engineering reports. Ecology may also modify this permit because of new or amended state or federal regulations.

Recommendation for Permit Issuance

The general permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics, protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. Ecology proposes to issue this general permit for five (5) years.

Bibliography

Documents prepared after June 12, 2014 also identify information sources by the following 11 categories:

1. Peer review is overseen by an independent third party.
2. Review is by staff internal to Department of Ecology.
3. Review is by persons that are external to and selected by the Department of Ecology.
4. Documented open public review process that is not limited to invited organizations or individuals.
5. Federal and state statutes.
6. Court and hearings board decisions.
7. Federal and state administrative rules and regulations.
8. Policy and regulatory documents adopted by local governments.
9. Data from primary research, monitoring activities, or other sources, but that has not been incorporated as part of documents reviewed under other processes.
10. Records of best professional judgment of Department of Ecology employees or other individuals.
11. Sources of information that do not fit into one of the other categories listed.

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Meacham, Pam and Pleus, Allan. 2008. Washington State Aquatic Nuisance Species Committee Report to the 2007 Legislature. http://wdfw.wa.gov/publications/00808/wdfw00808.pdf [1]

Molnar, J., R. Gamboa, C. Revenga, and M. Spalding. 2008. Assessing the global threat of invasive species to marine biodiversity. *Front Ecol Environ* 6(9): 485-492. [1]

Pimentel, D., S. McNair, J. Janecka, J. Wightman, C. Simmonds, C. O'Connell, E. Wong, L. Russel, J. Zern, T. Aquino and T. Tsomondo. 2001. Economic and environmental threats of alien plant, animal, and microbe invasions. *Agriculture, Ecosystems & Environment* 84(1): 1-20. [1]

Rothlisberger, J. D., Finnoff, D. C., Cooke, R. M., Lodge, D. M. 2012. Ship-borne Nonindigenous Species Diminish Great Lakes Ecosystem Services. *Ecosystems* 15: 462–476. [1]

The Final Working Draft of the Columbia River Basin Interagency Invasive Species Response Plan: Zebra Mussels and Other *Dreissenid* Species. Columbia River Basin Team, 100th Meridian

Initiative, February 6, 2008.
http://www.100thmeridian.org/ActionTeams/Columbia/CRB%20Dreissenid%20Rapid%20Response%20Plan%202-6-08.pdf [11]

Court Cases

Headwaters et al., v. Talent Irrigation District. U.S. Ct. of Appeals for the Ninth Cir. Ct. Case No. 99-35373, D.C. No.CV-98-06004-ALA. March 12, 2001.
Cases not available online at www.ca9.uscourts.gov before 2005. [6]

Fairhurst v. Hagener, Director, Montana Department of Fish, Wildlife & Parks. U.S. Ct. of Appeals for the Ninth Cir. Ct. Case No. 04-35366, D.C. No.CV-03-00067-SEH OPINION. September 8, 2005. http://www.ca9.uscourts.gov/datastore/opinions/2005/09/07/0435366.pdf. [6]

League of Wilderness Defenders et al., v. Harv Forsgren, Regional Forester, Pacific Northwest Region United States Forest Service. U.S. Ct. of Appeals for the Ninth Cir. Ct. Case No. 01-35729, D.C No.CV-00-01383-RE OPINION. November 4, 2002.
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The National Cotton Council of America et al., v. United States Environmental Protection Agency. U. S. Ct. of Appeals for the Sixth Cir. Ct. Case Nos. 06-4630;07-3180/3181/3182/3183/3184/3185/3186/3187/3191/3236. January 7, 2009. http://www.ca6.uscourts.gov/opinions.pdf/09a0004p-06.pdf. [6]

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Marine Environmental Consortium, et al. v. Global Aqua-USA L.L.C. & Ecology, PCHB 96-257 (Nov. 30, 1998) [6]

Federal Publications

40 CFR 122: EPA Administered Permit Programs: the National Pollutant Discharge Elimination System. [7]

40 CFR 122.3: Exclusions. [7]

40 CFR 122.41: Conditions applicable to all permits. [7]

40 CFR 125.3: Technology-based treatment requirements in permits. [7]

40 CFR 131.36: Toxics criteria for those states not complying with Clean Water Act section 303(c)(2)(B). [7]

40 CFR 136: Guidelines Establishing Test Procedures for the Analysis of Pollutants. [7]

40 CFR 171.4: Standards for certification of commercial applicators. [7]

40 CFR 172: Experimental Use Permits. [7]

40 CFR 403.3: Definitions. [7]

Environmental Protection Agency. 2011. Final National Pollutant Discharge Elimination System (NPDES) Pesticide General Permit (PGP) for Point Source Discharges to Waters of the United States from the Application of Pesticides Fact Sheet. [4,11]

Federal Insecticide, Fungicide and Rodenticide Act (FIFRA): http://www.epa.gov/agriculture/lfra.html. [7]

Federal Water Pollution Control Act. 33 USC 1251 et seq.: http://www2.epa.gov/laws-regulations/summary-clean-water-act. [7]

Food Quality Protection Act: http://www.epa.gov/laws-regulations/summary-food-quality-protection-act. [7]

National Toxics Rule: http://water.epa.gov/lawsregs/rulesregs/ntr/. [7]

Revised Code Washington (RCW)

Chapter 15.58 RCW: Washington Pesticide Control Act [7]

Chapter 17.10 RCW: Noxious Weeds — Control Boards [7]

Chapter 17.15 RCW: Integrated Pest Management [7]

Chapter 17.21 RCW: Washington Pesticide Application Act [7]

Chapter 34.05 RCW: Administrative Procedure Act [7]

Chapter 43.21C RCW: State Environmental Policy [7]

Chapter 77.12 RCW: Powers and Duties [7]

Chapter 77.135 RCW: Invasive Species [7]

Chapter 79A.25 RCW: Recreation and Conservation Funding Board [7]

Chapter 90.48 RCW: Water Pollution Control [7]

Chapter 90.52 RCW: Pollution Disclosure Act of 1971 [7]

Chapter 90.54 RCW: Water Resources Act of 1971 [7]

Chapter 90.58 RCW: Shoreline Management Act of 1971 [7]

Washington Administrative Code (WAC)

Chapter16-228 WAC: General Pesticide Rules [5]

Chapter 16-233 WAC: Worker Protection Standards [5]

Chapter 173-50 WAC: Accreditation of Environmental Laboratories [5]

Chapter 173-200 WAC: Water Quality Standards for Groundwaters of the State of Washington [5]

Chapter 173-201A WAC: Water Quality Standards for Surface Waters of the State of Washington [5]

Chapter 173-204 WAC: Sediment Management Standards [5]

Chapter 173-216 WAC: State Waste Discharge Program [5]

Chapter 173-220 WAC: National Pollutant Discharge Elimination System Permit Program [5]

Chapter 173-224 WAC: Permit Fee Schedule [5]

Chapter 173-226 WAC: Waste Discharge General Permit Program [5]

Chapter 197-11 WAC: SEPA Rules [5]

Chapter 220-12 WAC: Food Fish and Shellfish [5]

Additional Information Sources about Aquatic Invasive Species

- Washington Invasive Species Council: http://www.invasivespecies.wa.gov/.
- Washington Department of Fish and Wildlife: http://wdfw.wa.gov/fish/ans/index.htm.

- United States Department of Agriculture's National Invasive Species Information Center: http://www.invasivespeciesinfo.gov/index.shtml.
- USGS – NAS – Nonindigenous Aquatic Species Information Resource: http://nas.er.usgs.gov/.
- Aquatic Nuisance Species Task Force: http://anstaskforce.gov/default.php.
- Tunicate information: http://wdfw.wa.gov/fish/ans/identify/html/index.php?species=didemnum_lahillei.
- *Caulerpa* information: http://www.fws.gov/lodi/aquatic_invasive_species/caulerpa.htm.
- Zebra and Quagga Mussel Information Resource Page: http://nas.er.usgs.gov/taxgroup/mollusks/zebramussel/.

APPENDIX A: GLOSSARY

All definitions listed below are for use in the context of this permit only.

303(d): Section 303(d) of the federal CWA requires states to develop a list of polluted water bodies every two years. For each of those water bodies, the law requires states to develop Total Maximum Daily Loads (TMDLs). A TMDL is the amount of pollutant loading that can occur in a given water body (river, marine water, wetland, stream, or lake) and still meet water quality standards.

Adopt: Permittees may choose to use an existing adaptive management plan for organisms treated under this permit as long as Ecology has approved and accepted the plan. For example, if WDFW has an Ecology-approved adaptive management plan for tunicate treatment, WDNR may decide to follow this plan rather than developing a new plan. The adopted plan must include the treatment proposed by WDNR.

Algae: Primitive, chiefly aquatic, one-celled or multi-cellular plant-like organisms that lack true stems, roots, and leaves but usually contain chlorophyll.

Algaecide: A chemical compound that kills or reduces the growth of algae

Allows: Permitted in compliance with the terms and conditions of this permit.

All Known and Reasonable Technologies (AKART): All known, available, and reasonable methods of pollution control and prevention as described in 90.48.010, 90.48.520, 90.52.040, and 90.54.020 RCW and 173-201A-020, 173-204-120, 173-204-400, 173-216-020, 173-216-050, 173-216-110, 173-220-130 WAC .

Constructed water bodies: A human-made water body in an area that is not part of a previously existing watercourse, such as ponds, streams, wetlands, etc.

Discharge: The addition of any pollutant to a water of the state.

Emergency: A situation where an immediate response (i.e. same day response) is needed to prevent reproduction or the rapid spread of an invasive species (e.g. zebra or quagga mussels). Incidents where rapid and early intervention is crucial to a successful management effort constitute an emergency. Examples include, but are not limited to, needing to treat species immediately to preclude or limit spawning or reproduction (e.g. tunicates). Timing is critical in these situations.

Experimental Use Permit: Federal and state permits that allow the use of unregistered pesticides in the context of research and development for registration of the pesticide under FIFRA Section 3, or in the context of research and development for registration of a new use of a currently registered pesticide under FIFRA Section 3 (see 40 CFR 172, 15.58.405 RCW, and WAC 16-

228-1460).

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA): Federal Insecticide, Fungicide, and Rodenticide Act. This federal law provides the basis for regulation, sale, distribution, and use of pesticides in the United States. FIFRA authorizes EPA to review and register pesticides for specified used. EPA has the authority to suspend or cancel the registration of a pesticide if subsequent information shows that continued use would pose unreasonable risks.

General Permit: A permit which covers multiple discharges of a point source category within a designated geographical rate, in lieu of individual permits being issue to each discharger.

Herbicide: A chemical designed to control or kill plants.

Individual permit: A discharge permit specific to a single point source or facility.

Insecticide: A chemical used to prevent, repel, control, or kill insects.

Integrated Pest Management: An ecologically based strategy for pest control that incorporates monitoring, biological, physical, and chemical controls in order to manage pests with the least possible hazard to humans, environment, and property. IPM considers all available control actions, including no action. Pesticide use is only one control action.

Molluscicides: Chemicals used to kill mollusks (such as snails).

NOI: Notice of Intent (to apply for coverage). This is a term used to describe the completed application form.

Nonnative invasive: An organism outside of its natural or historical range of distribution that tends to spread and dominate new areas. Organisms considered to be nonnative were not present in Washington prior to European settlement. Many nonnative organisms are not invasive or problematic.

Organisms: Any life form considered as an entity; an animal, plant, fungus, protistan, or moneran.

Permittee: Any state government entity that applies for and gains coverage under this permit and has control of, or causes a discharge under coverage of this permit.

Pesticide: Any substance or mixture of substances intended to prevent, destroy, control, repel, or mitigate any insect, rodent, snail, slug, fungus, weed, and any other form of plant or animal life or virus, except virus on or in a living person or other animal which is normally considered to be a pest or which the director (of Agriculture) may declare to be a pest (RCW 17.21.020).

Piscicides: Chemicals used to kill fish.

Pollutant: Means any substance discharged that would alter the chemical, physical, thermal, biological, or radiological integrity of the waters of the state or would be likely to create and nuisance or renders such waters harmful, detrimental, or injurious to the public health, safety, or welfare, or to any legitimate beneficial use, or to any animal life, either terrestrial or aquatic. Pollutants include, but are not limited to the following: dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, pH, temperature, total suspended solids, turbidity, color, biological oxygen demand, total dissolved solids, toxicity, odor, and industrial, municipal, and agricultural waste.

Potentially invasive: A nonnative organism that has a possibility of spreading and dominating new areas, displacing native species.

Rapid response: Incidents where rapid and early intervention is crucial to a successful management effort. Examples include, but are not limited to, needing to treat species immediately to preclude or limit spawning or reproduction (tunicates). Timing is critical in these situations.

Retention and detention ponds: A retention pond is designed to hold a specific amount of water indefinitely. A detention pond holds a set amount of water that slowly drains to another location. Detention ponds are often only full of water after rain whereas a retention pond should always have water in it.

Surface waters of the state of Washington: Freshwaters (lakes, rivers, ponds, streams, inland waters), brackish waters, marine waters, estuarine waters, and all other above ground waters and watercourses within the jurisdiction of the state of Washington.

Threatened and endangered aquatic species:

> *Threatened*: An animal species likely to become endangered within the foreseeable future throughout all or a significant portion of its range. http://www.fws.gov/endangered/, http://www.noaa.gov/fisheries.html
>
> *Endangered*: An animal species in danger of extinction throughout all or a significant portion of its range. http://www.fws.gov/endangered/, http://www.noaa.gov/fisheries.html

Treatment area: The area where the chemical is applied and the concentration of the chemical is adequate to cause the intended effect on targeted organisms.

Upland farm pond: Private farm ponds created from upland sites that did not incorporate natural water bodies (WAC 173-201A-260(3)(f)).

Waters of the State: All surface and ground waters in Washington State as defined by chapter

90.48.020 RCW, 173-201A-020 WAC, and 173-226-030 WAC including any future amendments of state law. Also includes drainages to waters of the state.

Wetland: Any area inundated with water sometime during the growing season and identified as a wetland by a local, state, or federal agency.

In the absence of other definitions set forth herein, the definition as set forth in 40 CFR Part 403.3 or in chapter 90.48 RCW shall be used for circumstances concerning discharges.

APPENDIX B: PUBLIC INVOLVEMENT INFORMATION

In order to be considered, all comments about the proposed permit must be received by 5 p.m. on July 1, 2016

Ecology has tentatively determined to re-issue the Aquatic Invasive Species Management General Permit for aquatic invasive species control activities as identified in Special Condition S1., Permit Coverage.

Ecology will publish a Public Notice of Draft (PNOD) on May 18, 2016 in the Washington State Register. The PNOD informs the public that the draft permit and fact sheet are available for review and comment.

The notice will also be emailed to those identified as interested parties.

Copies of the draft general permit, fact sheet, and supporting documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the Ecology offices listed below, may be obtained from Ecology's website, or by contacting Ecology by mail, phone, fax, or email.

Permit website: http://www.ecy.wa.gov/programs/wq/pesticides/invasive.html

Ecology Headquarters Building Address:
300 Desmond Drive
Lacey, WA 98503

Contact Ecology

Department of Ecology
Water Quality Program
Attn: Invasive Species Permit Manager
P.O. Box 47600
Olympia, WA 98504-7600

Nathan Lubliner
Email: nathan.lubliner@ecy.wa.gov
Phone: 360-407-6563
Fax: 360-407-6426

Submitting Written and Oral Comments

Ecology will accept written comments on the draft Aquatic Invasive Species General Permit, fact sheet, and notice of intent (application). Ecology will also accept oral comments at the public hearing on June 21, 2016 at the Lacey, Ecology headquarters building at 1:00 p.m. Comments should reference specific text when possible. Comments may address the following:

- Technical issues,
- Accuracy and completeness of information,
- Adequacy of environmental protection and permit conditions, or

- Any other concern that would result from the issuance of this permit.

Ecology prefers comments be submitted using the comment form on the permit webpage: http://www.ecy.wa.gov/programs/wq/pesticides/invasive.html

Written comments must be postmarked, received via comment form or received via email no later than 5:00 p.m., July 1, 2016.

Submit written, hard copy comments to:

Nathan Lubliner
Department of Ecology
P.O. Box 47600
Olympia, WA 98504-7600

You may also provide oral comments by testifying at the public hearing.

Public Hearing and Workshop
A public hearing and workshop on the draft general permit will be held at the location below. The hearing provides an opportunity for people to give formal oral testimony and comments on the draft permit. The workshop held immediately prior to the public hearing will explain the special conditions of the Aquatic Invasive Species General Permit.

Workshop and Hearing

June 21, 2016
1:00 pm
Washington State Department of Ecology
300 Desmond Drive
Lacey, WA 98503-1274

The workshop and hearing may also be attended as a webinar where individuals may view the presentation and provide testimony via computer or mobile device. To register for the webinar go to: https://wadis.webex.com/wadis/j.php?RGID=m0821d2506aaee820d329e86c1e3e3da3. Once the host approves your request, you will receive a confirmation email with instructions for joining the meeting.

Issuing the Final Permit
The final permit will be issued after Ecology receives and considers all public comments. Ecology expects to reissue the general permit in the summer of 2016. It will be effective one month after the issuance date.

For further information, contact the Permit Writer, Nathan Lubliner, at Ecology, by phone at 360-407-6563, by email at nathan.lubliner@ecy.wa.gov, or by writing to Ecology at the Olympia address listed above.

APPENDIX C: RESPONSE TO COMMENTS

Look for the Response to Comments document on the Aquatic Invasive Species Management Permit web page: http://www.ecy.wa.gov/programs/wq/pesticides/invasive.html.

Redline Comparison between the 2016 Draft Aquatic Invasive Species Management General Permit and the 2011 Aquatic Invasive Species Management General Permit

This document provides a comparison between the draft permit out for public review (May 18, 2016 through July 1, 2016) and the current permit (2011). Redlines and red text indicate changes from the current (2011) permit language. Black text indicates that the language is the same in both the current and draft permits. Double underlined green text indicates text that has been moved to a different location in the permit document.

May 18, 2016

Issuance Date: August, 2016 ~~April 20, 2011~~
Effective Date: September, 2016 ~~May 20, 2011~~
Expiration Date: September, 2021 ~~May 20, 2016~~

DRAFT

AQUATIC INVASIVE SPECIES MANAGEMENT GENERAL PERMIT

National Pollutant Discharge Elimination System and
~~State Waste Discharge General Permit~~
State Waste Discharge General Permit

State of Washington
Department of Ecology
Olympia, Washington 98504

In compliance ~~Incompliance~~ with the
provisions of Chapter 90.48 Revised Code
of Washington
(State of Washington Water Pollution Control Act)
and
Title 33 United States Code, Section 1251 et seq.
The Federal Water Pollution Control Act (The Clean Water Act)

Until this permit expires, is modified or revoked, Permittees that have properly obtained coverage under this general permit are authorized to discharge in accordance with the ~~-~~special and general conditions that follow.

~~Ke~~ Heather R. Bartlett

Water ~~lly se nd, P.E., P.G.~~
~~W r~~ Quality Program Manager

Washington State Department of Ecology

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LIST OF TABLES

SUMMARY OF PERMIT REPORT SUBMITTALS

Refer to the Special and General Conditions of this permit for submittal requirements.

Permit Section	Submittal	Frequency	~~First~~ Submittal Date
S2.B	Application for Coverage	Once	At least 38~~60~~ days prior to the start of
S5.~~B~~	Adaptive Management Plans	As necessary	Within 18 months after first treatment for each organism or category of
S7.A	Monitoring Plan	Annually	February 1~~, 2012~~
S9.A.2	Monitoring Report	Annually	February 1~~, 2013~~
S9.A.1~~B~~	Treatment Report	Annually	February 1~~, 2012~~
S9.D	Reporting Permit Violations	As necessary	As necessary
G3~~G5~~	Permit Actions	As necessary	As necessary
G4~~G6~~	Reporting Planned Changes	As necessary	As necessary
G7~~G13~~	Transfer of Permit Coverage	As necessary	As necessary
G22 ~~G18~~	Duty to Reapply	Once per permit cycle	Within 180 days of permit expiration date

SPECIAL PERMIT CONDITIONS

S1. PERMIT COVERAGE

A. Activities Covered Under This Permit

This general permit covers management activities for ***nonnative*** ***invasive~~invasive~~***[1] aquatic animals and nonnative invasive marine ***algae*** that result in the discharge of chemicals or ***control*** products into ***surface waters of the state of Washington***. Surface waters include fresh, brackish, marine, and estuarine waters. Products regulated under this permit include ***algaecides, herbicides, insecticides, molluscicides, piscicides*** and any other chemical or product appropriate for use in managing these organisms.

Management activities are organized into two categories: Marine Projects and Freshwater Projects. The permit may have different requirements for each category and for the different chemicals or products allowed for use.

1. Marine Projects

   Marine projects occur in marine or estuarine waters and target nonnative invasive animals and nonnative invasive algal species.

   a. The Washington Department of Ecology (Ecology) only **allows** marine projects for:

      i. Animal species as identified in Washington Administrative Code (WAC) 220-12-090.

      ii. Animals or marine algae listed on the Washington Aquatic Nuisance Species Committee "watch list" of invasive species or on the Washington Invasive Species Council (WISC) management priority list.

      iii. Animals listed by the United States Fish and Wildlife Service (USFWS) as injurious wildlife under the Lacey Act (18 U.S.C. 42; 50 CFR 16).

      iv. Nonnative ***potentially invasive*** marine animals and algae not listed on the above lists, as determined by Ecology in consultation with the Washington Department of Fish and Wildlife (WDFW), or the Washington Department of Natural Resources (WDNR), or the Washington Department of Agriculture (WSDA), or the WISC, or the Washington Aquatic Nuisance Species (ANS) Committee, or applicable federal agencies such as the USFWS.

2. Freshwater Projects

   Freshwater projects occur in rivers, streams, lakes, ponds, brackish inland water bodies, ***wetlands***, or wet areas and target nonnative invasive freshwater animals. Ecology

[1] ~~The text of this permit contains italicized and bolded words or phrases. These words or phrases are the first usage in this permit and are defined in the Glossary, Appendix A.~~

regulates chemicals and products allowed for freshwater algae and freshwater in-water macrophyte management under the Aquatic Plant and Algae Management National Pollutant Discharge Elimination System (NPDES) permit (WAG-994000) and any subsequent permits issued for this activity.

a. Ecology only allows freshwater projects for:

   i. Prohibited or unlisted freshwater animals as identified in WAC 220-12-090.

   ii. Freshwater animals listed on the Washington Aquatic Nuisance Species Committee "watch list" of invasive species or on the Washington Invasive Species Council (WISC) management priority list.

   iii. Freshwater animals listed by the USFWS as injurious wildlife under the Lacey Act (18 U.S.C. 42; 50 CFR 16).

   iv. Nonnative potentially invasive freshwater animals not listed on the above lists, as determined by Ecology in consultation with WDFW, or WDNR, or WSDA, or WISC, or the ANS Committee, or applicable federal agencies such as the USFWS.

B. Activities That May Not Need Coverage Under This Permit

The use of **pesticides** on the following sites may not require coverage under this permit:

1. Constructed detention or retention ponds designed specifically for wastewater or stormwater treatment that do not have an outlet to surface waters of the state, or ponds that do not discharge to other water bodies during or for two weeks after treatment.

2. Constructed detention and retention ponds where Ecology regulates its discharge under another permit and the permit allows chemical treatment.

3. Any ***constructed water body*** five acres or less in surface area with no discharge to other surface waters of the state during treatment and for two weeks after treatment.

4. ***Upland farm ponds*** with no discharge to other surface waters of the state during treatment and for two weeks after treatment.

5. Treatment conducted on ***seasonally dry land surfaces*** (including seasonally dry wetlands) as long as treatment occurs when the area is dry and the active ingredient is not biologically available when the water returns.

6. Research activities when applying chemicals or products to water bodies under a State Experimental Use permit (see S4.C).

C. Geographic Area Covered

This general permit covers the activities listed in S1.A throughout surface waters of the state of Washington and in marine waters up to twelve-miles offshore or to the international border when applicable.

This permit does not apply to:

1. Federal lands where a federal agency provided funding, made the decision to apply chemicals, or is the entity applying chemicals.

2. ***Indian Country*** and trust or restricted lands except portions of the Puyallup Reservation as noted below.

3. Puyallup Exception: Following the Puyallup Tribe of Indians Land Claims Settlement Act of 1989, 25 U.S.C. §1773; this permit does apply to land within the Puyallup Reservation except for discharges to surface water on land held in trust by the federal government.

S2. APPLICATION FOR COVERAGE

A. Who May Apply for Coverage

Any state government entity may apply for coverage. This permit covers activities outlined in S1.A performed by government entities, ***non-governmental organizations*** or ***private applicators***. ***Washington State government agencies*** holding permit coverage may, in turn, contract with other state or local government entities, non-governmental organizations, or private applicators or individuals to conduct activities outlined in S1.A of this permit.

Contractors must agree to carry out treatments in a manner that complies with the permit. Either the ***Permittee*** or contractor (per individual agreement) may carry out notification, monitoring, reporting, documentation, planning, and other administrative permit tasks.

B. How to Obtain Coverage

Any state government entity seeking to obtain coverage for activities covered under this permit must:

1. Submit an application for coverage no later than 38~~60~~ days prior to the planned discharge date. A complete application must include a completed and signed Notice of Intent (***NOI***).
   ~~) and a completed and signed State Environmental Policy Act (SEPA) checklist.~~

2. Publish twice, one week apart, a public notice in a local newspaper of general circulation that an application for permit coverage has been made pursuant to WAC 173-226-130(5).

3. Publish the public notice only after Ecology has received the complete application for coverage.

4. Use the Public Notice Template provided in the NOI~~as Appendix B of this permit~~. The applicant may add additional information to the template provided that the required information remains as stated on the template.

5. Submit an original copy of the portion of the newspaper publication containing the Public Notice and newspaper date to Ecology for each week the Public Notice is published, or submit a signed, notarized affidavit of publication indicating what is included in the Public Notice and the dates that the Public Notice will be published.

6. At the end of the 30-day comment period, Ecology will consider comments about the applicability of this permit to the proposed discharge activity before deciding to issue permit coverage.

C. Permit Coverage Timeline

1. ~~Ecology will notify new applicants of their status concerning coverage under this permit.~~ If the applicant does not receive notification ~~of the coverage decision~~ from Ecology, permit coverage ~~under this permit will~~ automatically commences~~commence~~ on whichever of the following dates occurs last:

   a. The 31st~~the 61st~~ day following receipt by Ecology~~Ecology's acceptance~~ of a completed application for coverage.

      a. The 31st day following the end of a 30-day public comment period.

      b. The effective date of the general permit.

2. Ecology may need additional time to review the application:

   b. If the application is incomplete.

      a. If it requires additional site-specific information.

      b. If the public requests a public hearing.

      c. If members of the public file comments.

      d. When more information is necessary to determine whether coverage under the general permit is appropriate.

3. When Ecology needs additional time:

   a. Ecology will notify the applicant in writing before the 31st day following the end of the 30 day public comment period and identify the issues that the applicant must resolve before a decision can be reached.

b. Ecology will submit the final decision to the applicant in writing. If Ecology approves the application for coverage, coverage begins the 31st day following approval, or the date the approval letter is issued, whichever is later.

D. How to Modify Permit Coverage

Entities that propose changes to the aquatic plant and algae control activities authorized by their original permit coverage, such as expanding the area covered, must revise and re-submit permit application materials in accordance with Special Condition S2.B.

E. How to Transfer Permit Coverage

A Permittee may transfer coverage to a new Permittee, in accordance with General Condition G7 of this permit, using the Transfer of Coverage Form found here: .

~~7.~~1. Both the original Permittee and the new Permittee must sign the form and provide the date that the new Permittee will take responsibility for permit coverage. Once both parties have signed the form, the new Permittee becomes responsible for permit compliance and permit fees on the date indicated on the form. The original Permittee remains responsible for, and subject to, all permit conditions and permit fees until the transfer is effective.

~~C.~~**F.** **How to Terminate Permit Coverage**

A Permittee may request termination of permit coverage by submitting a Notice of Termination form (NOT) to Ecology. The Permittee will continue to incur an annual permit fee unless it submits a NOT.

S3. DISCHARGE LIMITS

~~A.~~**B.** **Short-term Modification of Water Quality Standards**

1. WAC 173-201A-410 allows short-term exceedance of the criteria and classifications established by this regulation when~~so long as~~ certain conditions are met. Such activities must be conditioned, timed, and restricted in a manner that will minimize water quality degradation to existing and characteristic uses.

~~a. If the Permittee has followed the requirements of WAC 173-201A-410 in developing a long-term integrated pest management plan (IPMP), in compliance with the Administrative Procedures Act (chapter 34.05 RCW), and in compliance with SEPA (chapter 43.21C RWC and 197-11 WAC), the Permittee may exceed the Water Quality Standards for multiple ***short duration application*** for up to five years.~~

~~b.~~a. ~~If~~ ~~the Permittee has not followed the requirements in WAC 173-201A-410 in developing the IPMP, then the Permittee must ensure that the short-term water quality exceedance duration is limited to ***hours or days*** for a specific application.~~

~~The~~ Activities covered under this permit are allocated a temporary zone of impact on beneficial uses, but the impact must be transient (hours or days), and must allow for full restoration of water quality and protection of beneficial uses upon project completion. The conditions of this permit constitute the requirements of a short-term water quality modification (WAC 173-201A-410).

~~2. permit allows the application of pesticides to waters of the state to manage aquatic invasive species so long as the Permittee meets all the terms and conditions of this permit and the transitory water quality impact is limited to the ***vicinity*** of the product application and limited to the minimum time necessary to accomplish the desired aquatic invasive species control objectives.~~

~~3. The applications authorized by this permit must not cause lasting or long-term harm to the environment.~~

~~B.~~C. Impaired Water Bodies

1. ~~Except for emergencies,~~ the Permittee must not cause further impairment of any ***303(d)- listed water body*** for any parameter. Phosphorus (in freshwater), dissolved oxygen, copper, temperature, and pH are specific parameters of concern.

~~2. The Permittee must not treat any 303(d) fresh water body listed for copper with copper unless the sediment copper concentration in the proposed treatment area is 110 mg/L or lower.~~

~~3.~~2. The Permittee must consider and apply one or more of the following mitigation measures to prevent further impairment (outside of the confines of the short-term modification of water quality standards allowed under this permit) when treating a 303(d)-listed water body (listed for the parameter), when the treatment has the potential to impact phosphorus, dissolved oxygen, temperature, or pH:

a. ***Limiting*** the area treated at any one time.

b. Timing treatment (early treatment versus late season treatment).

c. Chemical/product choice.

d. Manual removal of dead organisms (e.g. fish, tunicates).

e. Aeration.

S4. RESTRICTIONS ON THE APPLICATION OF PRODUCTS

A. Authorized Discharges

1. Beginning on the effective date of this permit and until Ecology replaces or revokes this permit; the permit authorizes the Permittee to discharge the chemicals or

products listed in this permit into surface waters of the State.

2. The Permittee may apply chemicals or products under this permit only for the management of aquatic invasive animals or invasive marine algae that meet the criteria outlined in S1.A. Temporary and limited impacts on non-target organisms are acceptable only to the extent needed to control the targeted organisms.

3. This permit does not cover activities that Ecology regulates under other NPDES permits, such as routine fish management using rotenone.

4. All discharges must comply with all applicable local, state, and federal laws, rules, and ordinances (see G6~~G9~~), and any additional requirements as specified in this permit.

5. The Permittee must coordinate with WSDA to ensure pesticide label approval prior to beginning any discharge activities. Authorization of pesticide discharge under this permit does not indicate registration approval under the Federal Insecticide Fungicide Rodenticide Act (FIFRA).

6. The Permittee must ensure the treatment as described in the permit application complies the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), and does not cause a take, as set out in Section 9 of the Act to an individual of a species listed as ***threatened*** or ***endangered*** unless that take is exempted under section 10 of the Act by the U.S. Fish and Wildlife Service or the National Oceanic and Atmospheric Administration. The list of endangered or threatened species is presented in 50 CFR 17.11(h).

7. The Permittee must ensure the treatment as described in the permit application complies with RCW 77.15.120 and 77.15.130 and does not cause a take of a state endangered or protected fish or wildlife unless take has been authorized by a rule of the commission, a permit issued by the department, or a permit issued pursuant to the federal endangered species act. The list of state endangered wildlife species is presented in WAC 232-12-014. The list of protected ("threatened" and "sensitive") species is presented in WAC 232-12-011.

B. Chemicals and Products Authorized For Use under this Permit

1. Ecology identifies specific restrictions on the use of each chemical or product in Tables 1 and 2. Not all chemicals or products can be used in both marine and freshwaters.

2. Ecology allows application of the following listed chemicals or products ~~and any other chemicals or products after they are approved through Ecology's approval process (see S10)~~ so long as the Permittee makes the application in compliance with all the terms and conditions of this permit:

   a. Sodium chloride for marine and freshwater application.

   b. Potassium chloride for marine and freshwater application.

c. Chlorine compounds including chlorine dioxide, sodium chlorite, sodium hypochlorite, and calcium hypochlorite for marine and freshwater application.

d. Acetic acid for marine and freshwater application

e. Calcium hydroxide/oxide (lime) and carbon dioxide for marine and freshwater application.

f. Rotenone for freshwater application.

~~g. Antimycin-A for freshwater application.~~

~~h.~~g. Potassium permanganate ($KMnO_4$) for freshwater application.

~~i.~~h. Endothall (e.g., Hydrothol 191™): mono(N,N-dimethylalkyalmine) salt of 7- oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid for freshwater application.

~~j.~~i. Sodium carbonate peroxyhydrate for freshwater application.

~~k.~~j. Methoprene for freshwater application.

~~l.~~k. Chelated copper compounds for freshwater application.

~~m.~~l. *Pseudomonas fluorescens* strain CLO145 for freshwater application.

~~n.~~m. Heating/cooling (temperature alteration) for marine and freshwater application.

C. Experimental Use Permits

1. Permittees may apply other chemicals not listed in this permit on a limited basis in the context of a research and development effort under the jurisdictions of the Environmental Protection Agency (EPA) and WSDA through the issuance of a federal Experimental Use Permit (40 CFR 172). Permittees must also obtain coverage under this general permit for any aquatic invasive species control project conducted under a federalExperimental Use Permit (EUP).
   ~~Experimental Use Permit (EUP).~~

2. For projects of one acre or less in size, the applicant must obtain coverage under a State EUP (issued by WSDA) and coverage under this general permit is not required.

D. Specific Restrictions on the Application of Products

1. Except for ***emergencies***, the Permittee must limit treatments that restrict public water use during weekends in ***high use areas*** or ***highly populated areas***.

2. Except for emergencies, the Permittee must make every effort to avoid pesticide applications that restrict public water use during the opening week of fishing season (freshwater treatments only), Memorial Day weekend, Independence Day weekend, and Labor Day weekend.

3. Permittees must comply with the specific application restrictions for each product as identified in Tables 1 and 2 and all Federal Insecticide, Fungicide, Rodenticide Act (FIFRA) label requirements. Requirements in this permit do not reduce the requirements on the FIFRA label.

4. The Permittee must comply with WDFW ~~developed the~~ timing windows referenced~~identified~~ in Tables 1 and 2 to protect salmon, steelhead, and bull trout populations and WDFW ~~avoid adverse impacts to~~ priority habitats and species.~~(federal and state listed and other sensitive and vulnerable species).~~ WDFW may periodically update this table as~~the tables when~~ new information becomes available or on request from Ecology. The timing table is available at: .~~.~~

   Permittees may consult with Ecology and WDFW to develop alternate timing windows if necessary so long as the new treatment windows do not adversely impact priority species and habitats. Contact Keith Folkerts of WDFW at Keith.Folkerts@dfw.wa.gov and apamprepostreat@ecy.wa.gov to request development of alternative timing windows. In the event that the email contacts become out-of-date, Ecology will provide updated contact information.

   Where Permittees are directed to consult with WDFW in the timing window table, they must provide Ecology with a consultation letter from WDFW indicating the approved timing window for the treatment.

5. Restrictions/Advisories identified in Tables 1 and 2: Recreational restrictions apply to swimming, boating, water skiing, etc. Swimming restrictions apply to primary contact activities such as swimming, wading, and water skiing.

6. Application of certain pesticides in Tables 1 and 2 require the use of tarpaulins or impermeable covers. Installation of tarpaulins or impermeable covers may require the Permittee to obtain a Hydraulic Project Approval Permit from WDFW.

Table ~~1~~: Marine Applications
Specific Restrictions on the Application of Chemicals for Managing Nonnative Invasive Marine Animals and Algae

Chemical or Control Measure	Subject to Timing Windows	Restrictions/ Advisories	Treatment Limitations
Sodium chloride & Potassium chloride	No, but check with WDFW before treatment to determine critical habitat areas.	None	➢ Limit treatments to the lowest effective concentration or amount of these salts necessary to kill the targeted organism. ➢ Limit treatment to docks, boat hulls, and fixed objects or defined areas. ➢ Spray or apply directly on target organisms when ~~if~~ they are out of water (apply at low tide). ➢ The Permittee may treat defined areas, such as marinas or coves, if the Permittee can limit water exchange behind impermeable barriers.
Chlorine	No, but check with WDFW before treatment to determine critical habitat areas.	If treating in an area accessible by the public, post buoys around the treatment **area.**	➢ Limit treatments to the lowest effective concentration or amount (e.g., if using swimming pool pellets) to kill the targeted organism. ➢ Where practicable, use chlorine dioxide/sodium chlorite instead of sodium hypochlorite or calcium hypochlorite. ➢ Use under tarpaulins or impermeable covers secured over the invasive organisms. Seal edges to the substrate as thoroughly as possible. ➢ Limit treatment to docks, boat hulls, and fixed objects or defined areas where the Permittee can secure impermeable covers. ➢ Leave tarpaulins on for at least one day before removing. If this is not possible, test for chlorine using a swimming pool test kit and neutralize any residual chlorine using ascorbic acid (vitamin C) before removing the cover.
Acetic Acid	No, but check with WDFW before treatment to determine critical habitat areas.	➢ If treating in an area accessible by the public, post buoys around the treatment area. ➢ Restrict swimming for 12 hours in the treatment area if spraying directly on organisms. ➢ Restrict public access to area	➢ Limit treatments to the lowest effective concentration to kill the targeted organism (vinegar concentrations – 5-10% are reported to be effective for soft-bodied marine organisms). ➢ Use under tarpaulins or impermeable covers secured over the invasive organisms. Seal the edges to the substrate as thoroughly as possible. ➢ Limit treatment to docks, boat hulls, and fixed objects or defined areas where the Permittee can secure impermeable covers. ➢ Remove covers as soon as the target organisms are dead. ➢ Spray directly on target organisms if they are out of water (tidal). ➢ The Permittee may treat defined areas, such as marinas, if the Permittee can limit water exchange behind impermeable barriers.

Calcium hydroxide /oxide (lime)	No, but check with WDFW before treatment to determine critical habitat areas.	If in an area accessible by the public, post buoys around the treatment area.	➢ Limit treatments to the lowest effective concentration or amount necessary to kill the targeted organism. ➢ Use under tarpaulins or impermeable covers secured over the invasive organisms and limit treatment to docks, boat hulls, and fixed objects or defined areas where the Permittee can secure impermeable covers. ➢ Remove covers as soon as the target organism is dead. ➢ For direct applications, apply only to target organisms (e.g. invasive echinoderms). Do not treat uninfested areas.
Heat/Freezing	No, but check with WDFW before treatment to determine critical habitat areas.	None	➢ Limit treatment to docks, boat hulls, and fixed objects or defined areas. ➢ May use in conjunction with pressure washing to remove invasive organisms from docks and infrastructure.

~~Chemical or Control Measure~~	~~Subject to Timing Windows~~	~~Restrictions/ Advisories~~	~~Treatment Limitations~~
		~~when diluting concentrated acid.~~	
~~Calcium hydroxide /oxide (lime)~~	~~No, but check with WDFW before treatment to determine critical habitat areas.~~	~~If in an area accessible by the public, post buoys around the treatment area.~~	~~➢ Limit treatments to the lowest effective concentration or amount necessary to kill the targeted organism.~~ ~~➢ Use under tarpaulins or impermeable covers secured over the invasive organisms and limit treatment to docks, boat hulls, and fixed objects or defined areas where the Permittee can secure impermeable covers.~~ ~~➢ Remove covers as soon as the target organism is dead.~~ ~~➢ For direct applications, apply only to target organisms (e.g. invasive echinoderms). Do not treat uninfested areas.~~
~~Heat/Freezing~~	~~No, but check with WDFW before treatment to determine critical habitat areas.~~	~~None~~	~~➢ Limit treatment to docks, boat hulls, and fixed objects or defined areas.~~ ~~➢ May use in conjunction with pressure washing to remove invasive organisms from docks and infrastructure.~~

Table ~~:~~2~~:~~ Freshwater Applications
Specific Restrictions on the Application of Chemicals for Managing Nonnative Invasive Freshwater Animals

Chemical	Subject to Timing Windows	Restrictions/ Advisories	Treatment Limitations
Sodium chloride & Potassium chloride	No, but check with WDFW before treatment to determine critical habitat areas.	None	➢ Use under tarpaulins or impermeable covers secured over the invasive organisms. ➢ Limit treatment to docks, boat hulls, and fixed objects or defined areas where the Permittee can secure impermeable covers. ➢ The Permittee may treat defined areas, such as coves or marinas, if the Permittee can limit water exchange behind impermeable barriers. **Whole Lake** ➢ The Permittee may treat ***small water bodies*** with potassium chloride where the threat of the invasive species outweighs other environmental damage and where water can be contained. ➢ For nonnative mussel eradication projects with potassium chloride, the Permittee must take steps to restore native mussel populations in the treated water body, when practicable.

Chlorine	Yes, also check with WDFW before treatment to determine critical habitat areas.	Advise no swimming in area when placing chemicals under covers and removing covers.	➢ Limit treatments to the lowest effective concentration or amount (e.g. if using swimming pool pellets) necessary to kill the targeted organism. ➢ Where practicable, use chlorine dioxide/sodium chlorite instead of sodium hypochlorite or calcium hypochlorite. ➢ Use under tarpaulins or impermeable covers secured over the invasive organisms. Seal edges to the substrate as thoroughly as possible. ➢ Limit treatment to docks, boat hulls, and fixed objects or defined areas where the Permittee can secure impermeable covers. ➢ Leave tarpaulins on for at least one day before removing. If this is not possible, test for chlorine using a swimming pool test kit and neutralize any residual chlorine using ascorbic acid (vitamin C) before removing the cover.
Acetic Acid	No, but check with WDFW before treatment to determine critical habitat areas.	Advise no swimming in area when placing chemicals under covers and removing covers.	➢ Limit treatments to the lowest effective concentration to kill the targeted organism (vinegar concentrations – 5-10% are reported to be effective for soft-bodied organisms). ➢ Use under tarpaulins or impermeable covers secured over the invasive organisms. Seal the edges to the substrate as thoroughly as possible. ➢ Limit treatment to docks, boat hulls, and fixed objects or defined areas where the Permittee can secure impermeable covers. ➢ Remove covers as soon as the target organisms are dead.
Calcium hydroxide/ oxide (lime)	No	No	➢ Whole water body applications permitted. ➢ The pH of the receiving water must remain between 6 and 9. Stop treatment if pH goes above 9.0.
Rotenone	Yes, also check with WDFW before treatment to determine critical habitat areas.	Follow EPA label restrictions and Rotenone SOP Manual	➢ Whole water body applications permitted. ➢ Endangered Species Act (ESA) listed fish species must not be present at the time of treatment and for three months following treatment, unless the state and federal fish agencies approve a treatment. ➢ Except for emergencies or when in situations where invasive species may move out of water body if treatment is delayed, limit treatment to periods of low water, usually September or October, unless the water body has a closed basin. ➢ Use liquid rotenone for spot applications only in areas that are not practicably accessible by boat. ➢ Unless the outlet is being treated for invasive species, in water bodies with flowing outlets, rotenone must be deactivated to eliminate downstream impacts. Below the deactivation zone (distance the water travels in 20 minutes), the rotenone must be totally neutralized using potassium permanganate. Residual potassium permanganate, not to exceed 2 mg/L past the deactivation zone. ➢ Follow monitoring requirements in Tables 4, 5, 6, 7 and 8. ➢ Restock the water body with appropriate fish species after eradication of the target species.

Potassium permanganate	Yes, also check with WDFW before treatment to determine critical habitat areas.		➢ Use under tarpaulins or impermeable covers secured over the invasive organisms. ➢ Limit treatment to docks, boat hulls, and fixed objects or defined areas where the Permittee can secure impermeable covers. ➢ The Permittee may treat defined areas, such as marinas, if the Permittee can limit water exchange behind impermeable barriers. ➢ The Permittee may treat enclosed, small water bodies where the threat of the invasive species outweighs other environmental damage. ➢ When used to deactivate rotenone treated waters – use calibrated equipment to achieve the minimum effective concentration of potassium permanganate necessary to oxidize the rotenone within the deactivation zone.
Endothall (Hydrothol 191™)	Yes	Contact recreational restriction during and 24-hours after treatment (in the entire water body)	➢ Treatment shall occur from the ***shoreline*** outward into the waterbody. ➢ Juvenile salmon species and ESA-listed species must not be present at the time of treatment.
Sodium carbonate peroxyhydrate	No	Swimming advisory during treatment, and 2-hour post-treatment (in the treatment area)	None
Methoprene	No	None	Do not apply in state-listed Areas of Restricted Larvicide and Adulticide Use identified in Ecology's mosquito NPDES permit without consulting with WDFW habitat biologists. http://www.ecy.wa.gov/programs/wq/pesticides/final_pesticide_permits/mosquito/index.html
Chelated Copper	Yes	None	➢ Use lowest effective concentration to kill targeted organism. ➢ Sediment copper concentrations in the treatment area must be less than 110 mg/kg (emergency exception for zebra or quagga mussel treatment, if there are no other suitable controls available). ➢ Do not apply copper if the water hardness is less than 50 mg/L expressed as calcium carbonate (emergency exception for zebra or quagga mussel treatment). ➢ Do not apply copper if the pH is less than 6.0 (emergency exception for zebra or quagga mussel treatment). ➢ Juvenile salmon species and Endangered Species Act listed species must not be present at the time of treatment, unless the state and federal fish agencies approve the treatment.
***Pseudomonas fluorescens* strain CLO145**	No	None	None

Heating/cooling	No, but check with WDFW before treatment to determine critical habitat areas.	None	➢ Limit treatment to docks, boat hulls, and fixed objects or defined areas. ➢ Direct heat or cold only at target organisms. ➢ May use in conjunction with pressure washing to remove invasive organisms from docks and infrastructure.

Chemical	Subject to Timing Windows	Restrictions/ Advisories	Treatment Limitations
Chlorine	Yes, also check with WDFW before treatment to determine critical habitat areas.	Advise no swimming in area when placing chemicals under covers and removing covers.	➢ Limit treatments to the lowest effective concentration or amount (e.g. if using swimming pool pellets) necessary to kill the targeted organism. ➢ Where practicable, use chlorine dioxide/sodium chlorite instead of sodium hypochlorite or calcium hypochlorite. ➢ Use under tarpaulins or impermeable covers secured over the invasive organisms. Seal edges to the substrate as thoroughly as possible. ➢ Limit treatment to docks, boat hulls, and fixed objects or defined areas where the Permittee can secure impermeable covers. ➢ Leave tarpaulins on for at least one day before removing. If this is not possible, test for chlorine using a swimming pool test kit and neutralize any residual chlorine using ascorbic acid (vitamin C) before removing the cover.
Acetic Acid	No, but check with WDFW before treatment to determine critical habitat areas.	Advise no swimming in area when placing chemicals under covers and removing covers.	➢ Limit treatments to the lowest effective concentration to kill the targeted organism (vinegar concentrations ~ 5-10% are reported to be effective for soft-bodied organisms). ➢ Use under tarpaulins or impermeable covers secured over the invasive organisms. Seal the edges to the substrate as thoroughly as possible. ➢ Limit treatment to docks, boat hulls, and fixed objects or defined areas where the Permittee can secure impermeable covers. ➢ Remove covers as soon as the target organisms are dead.
Calcium hydroxide/ oxide (lime)	No	No	➢ Whole water body applications permitted. ➢ The pH of the receiving water must remain between 6 and 9. Stop treatment if pH goes above 9.0.
Rotenone	Yes, also check with WDFW before treatment to determine critical habitat areas.	Follow EPA label restrictions	➢ Whole water body applications permitted. ➢ Endangered Species Act (ESA) listed fish species must not be present at the time of treatment and for three months following treatment, unless the state and federal fish agencies approve a treatment. ➢ Except for emergencies or when in situations where invasive species may move out of water body if treatment is delayed, limit treatment to periods of low water, usually September or October, unless the water body has a closed basin. ➢ Limit airborne dust. In open water areas accessible by boat, use powdered rotenone mixed with water and apply as a slurry. ➢ Use liquid rotenone for spot applications only in areas that are not practicably accessible by boat.

Chemical	Subject to Timing Windows	Restrictions/ Advisories	Treatment Limitations
			➢ Unless the outlet is being treated for invasive species, in water bodies with flowing outlets, rotenone must be neutralized to eliminate downstream impacts. Below the neutralization zone (distance the water travels in 20 minutes), the rotenone must be totally neutralized using potassium permanganate. Residual potassium permanganate, not to exceed 2 mg/L past the neutralization zone. ➢ Follow monitoring requirements in Tables 4,5,6. ➢ Restock the water body with appropriate fish species after eradication of the target species.
Antimycin-A	Yes, also check with WDFW before treatment to determine critical habitat areas.	Follow EPA label restrictions	➢ Use only in shallow water bodies (water bodies with depths less than five feet) and streams. ➢ ESA-listed species must not be present at the time of treatment and for three months following treatment, unless the state and federal fish agencies approve the treatment. ➢ Except for emergencies or in situations where invasive species may move out of water body if treatment is delayed, limit treatment to periods of low water, usually September or October, unless the water body has a closed basin. ➢ Unless the outlet is being treated for invasive species, in water bodies with flowing outlets, antimycin-A must be neutralized to eliminate downstream impacts. Below the neutralization zone (distance the water travels in 20 minutes), the antimycin-A must be totally neutralized using potassium permanganate. Residual potassium permanganate, not to exceed 2 mg/L past the neutralization zone. ➢ Follow monitoring requirements in Tables 4,5, 6. ➢ Restock the water body with appropriate fish species after eradication of the target species.
Potassium permanganate	Yes, also check with WDFW before treatment to determine critical habitat areas.		➢ Use under tarpaulins or impermeable covers secured over the invasive organisms. ➢ Limit treatment to docks, boat hulls, and fixed objects or defined areas where the Permittee can secure impermeable covers. ➢ The Permittee may treat defined areas, such as marinas, if the Permittee can limit water exchange behind impermeable barriers. ➢ The Permittee may treat enclosed, small water bodies where the threat of the invasive species outweighs other environmental damage. ➢ When used to neutralize rotenone or antimycin treated waters – use calibrated equipment to achieve the minimum effective concentration of potassium permanganate necessary to oxidize the rotenone within the neutralization zone.

Chemical	Subject to Timing Windows	Restrictions/ Advisories	Treatment Limitations
Endothall (Hydrothol 191™)	Yes	Contact **recreational restriction** during and 24 hours after treatment (in the entire water body)	➢ Treatment shall occur from the **shoreline** outward into the waterbody. ➢ Juvenile salmon species and ESA-listed species must not be present at the time of treatment.
Sodium carbonate peroxyhydrate	No	Swimming advisory during treatment, and 2-hour post-treatment (in the treatment area)	None
Methoprene	No	None	Do not apply in state-listed restricted use areas identified in Ecology's mosquito NPDES permit without consulting with WDFW habitat biologists.
Chelated Copper	Yes	None	➢ Use lowest effective concentration to kill targeted organism. ➢ Sediment copper concentrations in the treatment area must be less than 110 mg/kg (emergency exception for zebra or quagga mussel treatment, if there are no other suitable controls available). ➢ Do not apply copper if the water hardness is less than 50 mg/L expressed as calcium carbonate (emergency exception for zebra or quagga mussel treatment). ➢ Do not apply copper if the pH is less than 6.0 (emergency exception for zebra or quagga mussel treatment). ➢ Juvenile salmon species and Endangered Species Act-listed species must not be present at the time of treatment, unless the state and federal fish agencies approve the treatment.
***Pseudomonas fluorescens* strain CLO145**	No	None	None
Heating/cooling	No, but check with WDFW before treatment to determine critical habitat areas.	None	➢ Limit treatment to docks, boat hulls, and fixed objects or defined areas. ➢ Direct heat or cold only at target organisms. ➢ May use in conjunction with pressure washing to remove invasive organisms from docks and infrastructure.

S5. PLANNING REQUIREMENTS

A. The Permittee must develop or ***adopt*** an Ecology-approved adaptive management plan (plan) that incorporates integrated pest management principles for ***organisms*** managed under this permit. Plans may be written to cover specific species such as the~~a~~ marine alga~~ such as~~ *Caulerpa taxifolia* or categories of organisms such as nonnative invasive marine tunicates. Two or more Permittees may collaborate to submit a single plan that covers the activities of more than one Permittee or their contractors.

B. The Permittee must submit a copy of the plan(s) to Ecology no later than eighteen months after starting initial treatment for each organism or category of organisms. Permittees must notify Ecology in writing prior to starting the first treatment for each organism or category of organisms.

C. The Permittee must consult with Ecology before finalizing the plan, consider and incorporate Ecology comments to the plan, and resubmit the plan according to the direction of Ecology no later than six months after written notification of a need for revision from Ecology. The Permittee and any contractors must implement the approved plan in all appropriate aquatic pest control activities.

D. If any discrete treatment will exceed the Water Quality Standards criteria for longer than hours or days, then the plan covering the management activity must also comply with the requirements in~~for IPM plans as outlined~~ S3.A.~~1.(a).~~

S6. POSTING AND NOTIFICATION REQUIREMENTS

A. Internet Notification

Each treatment season, the Permittee must post information on its website about the locations of planned treatments, timing of treatments, chemicals or products proposed for use, and information about the organism(s) to be treated.

B. Residential and Business Notification

1. The Permittee must provide Residential and Business Notice to all waterfront residences and businesses within one-quarter mile in each direction along the shoreline or across the water from the proposed treatment areas. The Permittee must use the Residential and Business Notice template (notice) on the permit website.~~in Appendix C.~~ The Permittee must not modify the template, except that, if desired, it may add additional information about the project, including a treatment map.

2. The Permittee may provide the notice by mail, newsletter, or handbills delivered directly to the residences or businesses.~~ If using handbills, the Permittee must secure the notice to the door in a fashion that will hold it in place but will not damage property. If the residence or business is gated or guarded by dogs, the Permittee may secure the notice in clear view on the outside of the gateway or may attach the notice to the outside of the~~

3. This permit does~~residence or business in a fashion that will hold it in place but will~~ not authorize trespass or damage to property as a result of providing business and residential notices.

4. The Permittee must provide the notice to residences and businesses 7 to 45~~21~~ days prior to initial treatment, except for emergencies. During an emergency, the Permittee may provide same day notice to residences and businesses. Even during emergencies, the Permittee must strive to provide as much advance notice as possible to the affected residents and businesses.

5. If the notice explains the ***application schedule*** for the entire annual treatment season and there is no deviation from that schedule, Ecology requires no further notice for the rest of the season (unless a resident or business specifically requests further notification about project treatment dates).

6. The Permittee must provide a copy of the notice including the date of distribution, to Ecology headquarters and appropriate regional office contacts no later than one business day following public distribution.

7. The Permittee must maintain a copy of the notice and a list of locations or addresses to which they were delivered for seven years. Upon request, the Permittee must provide a copy of the notice and list of recipients to Ecology within five business days.

8. For freshwater projects only: When the chemical or product's label or the permit has restrictions and/or precautions for potable or domestic water use, irrigation use, or livestock watering, the Permittee must notify those who withdraw surface waters for such uses. This notification must identify the chemicals(s) or product(s) it plans to use, the date(s) of expected treatment, and all water use restrictions and precautions, including information about who the water user can contact to obtain an alternate water supply during treatment. The Permittee must not treat an area until it has notified people who withdraw water and it has provided an alternative water supply, if requested by the affected water user(s).

C. Shoreline Posting Requirements

1. General Requirements for Posting Shoreline Treatment Notification Signs

   a. The Permittee must post shoreline treatment notification signs (signs) no more than 72 hours prior to the application of any chemical or product covered under this permit.

   b. The Permittee must post signs so that they are secure from the normal effects of weather and water currents, but cause minimal damage to property.

   c. The Permittee must make best efforts to ensure that the signs remain in place until the end of the period of any water use restrictions.

d. The Permittee must remove all old signs before a new treatment begins or before the end of the treatment season, whichever comes first.

e. The Permittee must post warning signs in English and if the majority of the affected community speaks a language other than English, the Permittee may use online translation websites ~~such as~~ http://babelfish.com or other translation services to make signs for public areas in these communities.

~~f. Ecology does not require shoreline posting in areas where public access is limited to boat only access and there are no private residents.~~

2. Posting **Privately or Publicly-owned Shoreline** Areas (Excluding Public Access Areas) with 8½ by 11 Inch Signs

a. The Permittee must post signs at each private residence or business property within 400 feet of the treatment area. The Permittee must post the signs to face ~~both the water and~~ the shore and site them where they are most visible to residents. The Permittee must post one sign for approximately every 100 feet of shoreline.

b. If a shoreline is only accessible by entering through a gate, the Permittee must post a sign at each gate that allows access to the treated area or is within 400 feet of a treated area. In these situations the Permittee does not need to post additional signs along the shoreline or at individual docks or moorages.

c. The Permittee must use the sign template provided on the permit website~~in Appendix D~~. Ecology does not allow modifications of templates, except that the Permittee must fill in label or other restrictions about the chemical or product to be used. If desired, the Permittee may provide additional information about the project on the sign, including a treatment map. In the event that the Permittee applies more than one chemical or product, the Permittee may include information about all chemicals/products on one sign.

3. Posting Public Access Areas with Two Foot by Three Foot Signs

Public access areas include public or community-provided swimming beaches, picnic areas, docks, marinas, and boat launches at state or local parks and private resorts.

a. The Permittee must post signs at all public access areas on the water body within one-quarter mile of the treatment site and at all public boat launches on the water body within one mile of the treatment site.

b. The Permittee must place the signs so that they are clearly readable to people using the public access areas, spacing the signs approximately every 100 feet of shoreline. Signs must face both the water and the shore. At public boat launches, signs need only face the shore.

c. If a public shoreline is only accessible by entering through a gate, the Permittee must post a sign at each gate that allows access to the treated area or is within 400 feet of a treated area. In these situations the Permittee does not need to post additional signs along the shoreline or at individual docks or moorages.

d. Signs must be a minimum size of two feet by three feet and constructed of durable weather-resistant material. The Permittee must attach an 8½ by 11 inch weather resistant map detailing the treatment sites for each chemical or product used. The map must identify the location(s) of the treatment site(s), identify addresses or parcels that represent the start and end points of the treatment area or provide gps coordinates that represents the corners of the treatment area polygon or identify a whole waterbody treatment and mark the reader's location.) and mark the reader's location at the public access area. In the event that the Permittee uses more than one chemical or product, each treatment area and the chemical/product used must be marked on the map.

Signs must:

Signs must:

1). Include the signal word "CAUTION" in bold black type at least two inches high. When the discharge is for rotenone include the signal word "DANGER".

2). Use a font at least ½ inch high for all other words.

4. Posting ***Public Pathways*** Along a Treated Water Body

a. The Permittee must post two foot by three foot signs at ***public entrances*** to public pathways that allow reasonable direct access to the water body and that are within a quarter mile of the treatment area (see S6.C.1 and S6.CB.3.dc. for sign specifications).

b. The Permittee must post 8½ by 11 inch signs (use the Template on the permit website in Appendix D for sign specifications) at approximately100-foot intervals along the pathway and within 400 feet of the treatment site.

S7. MONITORING REQUIREMENTS

Sampling and analytical methods used to meet the monitoring requirements specified in this permit must conform to the latest revision of the Guidelines Establishing Test Procedures for the Analysis of Pollutants contained in 40 CFR Part 136 (or as applicable in 40 CFR subchapters N [Parts 400–471] or O [Parts 501-503]) unless otherwise specified in this permit. Ecology may only specify alternative methods for parameters without limits and for those parameters without an EPA approved test method in 40 CFR Part 136.

All samples must be analyzed by a laboratory registered or accredited under the provisions of Accreditation of Environmental Laboratories, Chapter 173-50 WAC. The following parameters need not be accredited or registered:

1. Flow.
2. Temperature.

3. Settleable solids.
4. Conductivity, except that conductivity must be accredited if the laboratory must otherwise be registered or accredited.
5. pH, except that pH must be accredited if the laboratory must otherwise be registered or accredited.
6. Turbidity, except that turbidity must be accredited if the laboratory must otherwise be registered or accredited.
7. Parameters which are used solely for internal process control

Documentation of monitoring activities and results must include (if applicable):
1. The date, exact place, and time of sampling.
2. The date analyses were performed.
3. Who performed the analyses.
4. The analytical techniques/methods used (if any).
5. The results of such analyses.

The Permittee must take representative samples and measurements to meet the requirements of this permit (i.e., representative of the volume and nature of the monitored parameters, including representative sampling of any unusual discharge or discharge condition, including spills, upsets, and maintenance-related conditions affecting water quality).

A. Monitoring Plans

1. The Permittee must submit an annual monitoring plan to Ecology by February 1 of each year. If two or more Permittees are working together on the same management activity, they may coordinate their monitoring efforts and submit an annual joint monitoring plan to Ecology.

Monitoring plans for a Permittee responding to an invasive species emergency, not able to meet the February 1 deadline, consists of conducting the minimum monitoring requirements given in tables 3, 4, 5, 6, 7, and 8.

2. The Permittee must monitor a subset of treated locations each year of treatment. The monitoring plan must provide specific monitoring locations, information on the parameters to be measured, and the rationale for their selection. At a minimum, the Permittee(s) must conduct treatment effectiveness monitoring for the target organism and any monitoring required in Tables 3, 4, 5, 6, 7 and 8~~6~~.

3. The Permittee must post all monitoring plans on its website after approval by Ecology.

B. Monitoring for Specific Chemicals

1. The Permittee must monitor for specific chemicals/products as identified in Tables 3, 4, 5, 6, 7 and 8.
~~6.~~

~~2. With Ecology approval, the Permittee may suspend monitoring for the parameters under the conditions identified in Tables 3, 4, 5, and 6.~~

Table ~~3.~~ Monitoring requirements

Chemical or Control Measures	Specific Monitoring Requirements
Sodium chloride & Potassium chloride	➢ For whole lake treatments or treatments of areas sequestered behind barriers within a larger fresh water body, the Permittee must at a minimum measure potassium or sodium chloride concentrations at one or more representative sampling locations pre- treatment, one, and five days post-treatment to determine actual water body concentrations.
Chlorine	➢ The Permittee must monitor for chlorine concentrations under impermeable covers on a representative number of sites before removing the covers. Permittee may use swimming pool test kits for this purpose. ➢ If monitoring demonstrates that undercover chlorine concentrations are always under 0.5 mg/L before removal (at a representative number of sites and for the same chlorine formulation), the Permittee may suspend monitoring upon Ecology approval.
Acetic Acid	➢ When removing impermeable covers, monitor pH levels in the receiving water before and immediately after cover removal. ➢ When directly spraying the organisms, monitor the pH of receiving waters directly adjacent to the organisms immediately before and after treatment.
Calcium hydroxide /oxide (lime)	**For Freshwater Treatments Only** ➢ Measure pH once a day before treatment; once in the morning and once in the afternoon during treatment; and for ten days following treatment at a representative site within the water body. ➢ For applications using continuous injection systems, measure pH once in the morning and once in the afternoon
Rotenone ~~and antimycin-A~~	See Special Condition S8- Rotenone Monitoring~~tables 4, 5, and 6~~ for specific monitoring requirements for rotenone ~~and antimycin-A~~.
Chelated Copper	➢ Before applying copper, measure sediment copper concentrations in a composite sample of sediment from a representative treatment area (composite sample from 5 areas with sediment taken from the top 5 cm of sediment and homogenized). ➢ Two weeks after completion of copper treatment, resample the treated area for copper using the sampling protocol above. ➢ Measure pH and hardness prior to treatment.
Heat/Freezing	➢ If used in conjunction with pressure washing to remove invasive organisms from docks and infrastructure, measure the temperature of the receiving water immediately before and immediately after the activity.

S8. Rotenone Monitoring

A. **Monitoring Schedule *Still Water***

Parameters	Units	Minimum Sampling Frequency	Type	Sampling Point
pH	Standard	Once pre-treatment	Grab	Representative
Temperature	°C or °Fahrenheit (F)	Once pre-treatment	Grab	Representative
Alkalinity Alkalinity[1]	mg/L CaCO3	Once pre-treatment	Grab	RepresentativeWorst-case scenario
Organic demand[1,2]	StandardStandard[2]	Once pre-treatment[1]	Grab	RepresentativeWorst-case scenario
Dissolved Oxygen[1] Only required when the Permittee uses potassium permanganate to neutralize rotenone.	mg/L	Once pre-treatment	Grab	
[1]WDFW[2] The Permittee must use the guidelines provided in Engstrom-Heg (1971) to determine organic demand for $KMnO_4$.				

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Table 4. PRE-TREATMENT MONITORING

Monitoring to occur within 48hours prior to : Pre-treatment monitoring for rotenone and antimycin A

TABLE 5. POST-TREATMENT MONITORING

Monitoring to occur immediately after treatment event but must not exceed 24 hours post-treatment event unless specified otherwise in the table.

Table 5: Post-treatment monitoring for rotenone and antimycin A

Parameters	Units	Minimum Sampling Frequency	Type	Sampling Point
pH	Standard	Once	Grab	Representative
Temperature	°F	Once	Grab	Representative
Rotenone Trout Toxicity Bioassay: 24-hr live box test (five trout); 60% trout survival	Hours until 60% survival	Once—approximately three to eight weeks after treatment	Observation (No lab accreditation required)	Worst-case scenario

If the Permittee applies liquid rotenone: **Volatile Organic Compound (VOC),** semi VOC, and any other inert ingredients listed on the **Material Safety Data Sheet (MSDS)**[‡]	µg/L	Four weeks post treatment and every week thereafter until non-detection	Grab	Worst case scenario
[‡]The Permittee must sample for VOC and semi-VOC when the liquid rotenone product used contains solvents that are listed on the label and/or the MSDS.				

Table 6: Monitoring for downstream and neutralized waters after rotenone or antimycin-A treatment

Parameters	Units	Minimum Sampling Frequency	Type	Sampling Point
pH	Standard	• Once pre-treatment • Once post-treatment	Grab	Representative
Temperature	°C or °F	Once pre-treatment Once post-treatment	Grab	Representative
Alkalinity[1]	mg/L as CaCO3	Once pre-treatment	Grab	Worst-case scenario
Organic demand[1,2]	Standard	Once pre-treatment	Grab	Worst-case scenario
Rotenone (if applied)[3]	mg/L	Once 24 hours after treatment	Grab	Worst-case scenario
Dissolved Oxygen *If the permittee applies liquid rotenone*: VOC, semi- VOC, and any other inert ingredients listed	mg µg/L	Once • 24 hours post-treatment • Four weeks post-treatment	Grab	Representative Worst-case scenario
Antimycin-A (if applied)[3]	µg/L	Once 24 hours following treatment	Grab	Worst-case scenario
Rotenone Trout Toxicity Bioassay: 48-24 hr live box test (5 trout); 60% trout survival[1])	% trout % survival	14 days after• Begin test at time of treatment and • Repeat weekly until 60% trout survival	Observation (No lab accreditation required)	Worst-case scenario
[1] WDFW may use the analytical method given in SOP:16.0 II.A (Finlayson, B., R. Schnick, D. Skaar, J. Anderson, L. Demmon, D. Duffield, W. Horton, and J. Steinbicker. 2010. Planning and [1]Q				
[2] The Permittee must use the guidelines provided in Engstrom-Heg (1971) to determine organic demand for $KMnO_4$.				
[3] The Permittee must use EPA approved testing methods in 40 CFR Part 136				

S8. ANALYTICAL PROCEDURES

A. The Permittee must use either an EPA method or one of the methods specified below to fulfill the analytical requirements of this permit. EPA publishes laboratory analytical methods used by industries and municipalities to analyze the chemical and biological components of wastewater, drinking water, sediment, and other environmental samples that are required by EPA regulations under the authority of the Clean Water Act (CWA) and the Safe Drinking Water Act. Most of these methods are published by EPA as regulations at 40 CFR Part 136 or in the latest revision of *Standard Methods for the Examination of Water and Wastewater*.

B. The Permittee must ensure that all monitoring data are analyzed by a laboratory registered or accredited under the provisions of chapter 173-50 WAC, Accreditation of Environmental Laboratories. The Permittee can locate an accredited laboratory at the following website: http://www.ecy.wa.gov/apps/eap/acclabs/labquery.asp.

Ecology does not require the use of an accredited laboratory for pH, temperature, or alkalinity titration. However pH and temperature monitoring must follow the protocols in "*A Citizens Guide to Understanding and Monitoring Lakes and Streams*," found at this link: http://www.ecy.wa.gov/programs/wq/plants/management/joysmanual/index.html

TABLE 6. MONITORING OF DOWNSTREAM AND DEACTIVATED WATERS

Pre-treatment sampling to occur within 48 hours prior to treatment event unless specifically stated. Post-treatment monitoring to occur immediately after treatment but not to exceed 24 hours after the treatment event unless specified otherwise in the table.

Parameters	**Units**	**Minimum Sampling Frequency**	**Type**	**Sampling Point**
pH	Standard	Twice: once pre-treatment and once post-treatment	Grab	Representative
Temperature	°C or °F	Twice: once pre-treatment and once post-treatment	Grab	Representative
Dissolved Oxygen	mg/L	Twice: once pre-treatment and once post-treatment	Grab	Representative
Alkalinity	mg/L CaCO3	Once pre-treatment	Grab	Representative
Organic demand[1],	Standard[2]	Once pre-treatment[1]	Grab	Worst-case scenario
Potassium Permanganate[2]	mg/L	Hourly during the period of deactivation	Grab	Downstream of Deactivation Zone
Trout Toxicity Bioassay: 24-hr live box test (5 trout) 60% trout survival	% trout survival	Every 2-4 hours until 60% of trout survive	Observation (No lab accreditation required)	Upstream and Downstream of Deactivation Zone

[1] Must use the guidelines provided in Engstrom-Heg (1971) to determine organic demand for $KMnO_4$.

[2] Must measure $KMnO_4$ in waters downstream of the deactivation zone using one of the two techniques given in Finlayson (2010). *

C. *Finlayson, B., R. Schnick, D. Skaar, J. Anderson, L. Demong, D. Duffield, W. Horton, and J. Steinkjer. 2010. Planning and Standard Operating Procedures for Use of Rotenone in Fish Management. American Fisheries Society, Bethesda, MD.

B. Monitoring Schedule for Treated Flowing Water

TABLE 7. PRE-TREATMENT MONITORING OF TREATED WATER

Pre-treatment sampling to occur within 24 hours prior to treatment event unless specified otherwise in the table.

Parameters	**Units**	**Minimum Sampling Frequency**	**Type**	**Sampling Point**
pH	Standard	Once pre-treatment	Grab	Representative
Temperature	°C or °F	Once pre-treatment	Grab	Representative
Dissolved Oxygen	mg/L	Once pre-treatment	Grab	Representative
Alkalinity	mg/L CaCO3	Once pre-treatment	Grab	Representative
Organic demand[1]	Standard[2]	Once pre-treatment[1]	Grab	Representative

[1] Must use the guidelines provided in Engstrom-Heg (1971) to determine organic demand for $KMnO_4$.

TABLE 8. POST TREATMENT MONITORING OF TREATED AND DEACTIVATED WATERS

Post-treatment monitoring to occur immediately after treatment but not to exceed 24 hours post- treatment event unless specified otherwise in the table.

Parameters	Units	Minimum Sampling Frequency	Type	Sampling Point
pH	Standard	Once post-treatment	Grab	Representative
Temperature	°C or °F	Once post-treatment	Grab	Representative
Dissolved Oxygen	mg/L	Once post-treatment	Grab	Representative
Potassium Permanganate[1]	mg/L	Hourly during the period of deactivation	Grab	Downstream of Deactivation Zone
Trout Toxicity Bioassay: 24-hr live box test (5 trout) 60% trout survival	% trout survival	Every 2-4 hours until 60% of trout survive	Observation (No lab accreditation required)	Upstream and Downstream of Deactivation Zone
[1] Must measure $KMnO_4$ in waters downstream of the deactivation zone using one of the two techniques given in Finlayson (2010).*				

*Finlayson,, B., R. Schnick, D. Skaar, J. Anderson, L. Demong, D. Duffield, W. Horton, and J. Steinkjer. 2010. Planning and Standard Operating Procedures for Use of Rotenone in Fish Management. American Fisheries Society, Bethesda, MD.

C. Monitoring For Water Bodies with Potable Water Users or With Surface Water Rights

When the chemical or product's label has a restriction and/or precautions for potable or domestic water use, irrigation use, or livestock watering the following monitoring must be completed prior to the Permittee notifying people who withdraw surface water that they may resume withdrawal (See Special Condition S6.B.8).

1. For potable water rights:

   a. Permittees must test the treated water body until it is shown to be below the EPA estimated drinking water level of concern of 40 ppb for rotenone. Permittees must use one of the methods given in SOP: 16 in the Rotenone SOP Manual*. The Permittee must test either three locations or test a number of locations equivalent to 20% of the potable water intakes on the water body, whichever is greater. Testing must occur in locations that are representative of the potable water intakes located on the water body.

   b. For treatments using liquid rotenone formulations that contain ***volatile organic compounds*** (VOC's): Permittees must demonstrate that the treated water body has returned to pre-treatment levels or is below 0.5 ppb for any VOC identified by the ***Material Safety Data Sheet (MSDS)*** or label for the product used. Permittees must conduct pre-treatment VOC testing to determine if VOC's are present in the water body prior to treatment (background levels of VOC's). Permittees are responsible for ensuring VOC's discharged to the water body from treatments have dissipated to background levels or dropped below 0.5 ppb before surface water withdrawal can resume. Analytical methods used for VOC monitoring must have a 0.5 ppb lower detection limit.

2. For irrigation and livestock watering rights: Permittees must demonstrate that the treated water body meets the standards applicable to crop irrigation and livestock watering required by the FIFRA label for the rotenone product used.

*Finlayson, B., R. Schnick, D. Skaar, J. Anderson, L. Demong, D. Duffield, W. Horton, and J. Steinkjer. 2010. Planning and Standard Operating Procedures for Use of Rotenone in Fish Management. American Fisheries Society, Bethesda, MD.

S9. REPORTING AND RECORDKEEPING REQUIREMENTS

The falsification of information submitted to Ecology constitutes a violation of the terms and conditions of this permit. The Permittee must submit ~~control~~ chemical application information in accordance with the following conditions:

A. Annual Reports

The annual treatment report and annual monitoring report may be combined and submitted as a single report.

1. **Annual Treatment Report~~Reports~~**

   a. The Permittee must submit its annual treatment report by February 1 of each year. A signed and dated copy of the report must be mailed to:

      Department of Ecology
      Water Quality Program
      Attn: Aquatic Invasive Species Management Permit Manager
      P.O. Box 47600
      Olympia, WA 98504-7600

   b. The annual treatment report must include:
      - Permit number
      - Permittee name
      - Treatment dates
      - Location(s) treated (water bodies treated and the treatment location within the water body)
      - Active ingredient(s) ~~or the product name~~ applied ~~during the treatment season~~
      - Pounds or gallons of product applied to each location.

2. **Annual Monitoring Reports**

   a. The Permittee must submit its annual monitoring report by **February 1** of each year. The Permittee must submit an annual monitoring report whether or not Ecology required monitoring. A signed and dated copy of the report must be mailed to the address inS9.A.1.a.

~~S9.A.1.~~

b. All laboratory results for chemical concentrations must include the following information:
    - Sampling date
    - Sample location (water body name and location within the water body)
    - Date of analysis
    - Parameter name
    - Chemical Abstract Service (CAS) number
    - Analytical method number
    - Method detection limit (MDL)
    - Laboratory practical quantitation limit (PQL)
    - Reporting units
    - Concentration detected

B. Recording of Results

For each measurement or sample taken, the Permittee must record the following information:

1. The date of sample collection, the name of the water body, the sampling location(s) within the water body, and the sampling methodology
2. The name of the individual who performed the sampling or measurement
3. The dates the laboratory performed the analyses
4. The laboratory or the name of the individual who performed the analyses
5. The analytical techniques or methods used
6. The results of all analyses

C. Records Retention

1. The Permittee must retain records of all monitoring information for a minimum of five (5) years. Such information must include all calibration and maintenance records, all original recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit.

~~permit.~~

2. The Permittee must extend this period of retention during the course of any unresolved litigation regarding the discharge of pollutants by the Permittee, or when requested by Ecology.

3. The records, reports, and other information required by this permit must be made available to Ecology upon request.

D. Reporting Permit Violations

The Permittee must take the following actions when it violates or is unable to comply with any permit condition:

1. Immediately take action to stop, contain, and clean up unauthorized discharges or otherwise stop the noncompliance and correct the problem.

2. The Permittee must report any noncompliance that may endanger health or the environment by telephone to Ecology at the regional spills hotline and the aquatic pesticides permit manager, within 24 hours from the time the Permittee becomes aware of the noncompliance.

   a. **Southwest Regional Office: 1-360-407-6300**
   (Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Mason, Lewis, Pacific, Pierce, Skamania, Thurston, and Wahkiakum counties).

   b. **Northwest Regional Office: 1-425-649-7000**
   (Island, King, Kitsap, San Juan, Skagit, Snohomish, and Whatcom counties).

   c. **Central Regional Office: 1-509-575-2490**
   (Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, and Yakima counties).

   d. **Eastern Regional Office: 1-509-329-3400**
   (Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, and Whitman counties).

   e. **Aquatic Invasive Species Management Permit Manager: 1-360-407-6600~~6562~~**

3. The Permittee must also provide a written submission within **five days** of the time that the Permittee becomes aware of any event required to be reported under 1 or 2 above. The written submission must contain:

   a. A description of the noncompliance and its cause.

b. The period of noncompliance, including exact dates and times.

c. The estimated time noncompliance is expected to continue if it has not been corrected.

d. Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

e. Updates that will be included in the Permittee's Adaptive~~Integrated Pest~~ Management Plan (Special Condition S5) to address the issue and prevent future noncompliance.

4. Ecology may waive the written report required in part three, above, on a case-by-case basis upon written request if it has received a timely oral report.

5. The Permittee must submit noncompliance reports to:

Department of Ecology
Water Quality Program
Attn: Aquatic Invasive Species Management Permit Manager
~~Attn: Aquatic Invasive Species Management Permit Manager~~
P.O. Box 47600
Olympia, WA 98504-7600

~~S10. CONDITIONAL APPROVAL FOR THE USE OF PRODUCTS NOT SPECIFIED IN THIS PERMIT~~

~~A. Product Approval~~

~~This permit allows the use of active ingredients not specifically listed in the permit if ALL of the following procedures are followed:~~

~~1. EPA and WSDA have approved the chemical or product for the specific use.~~

~~2. The Permittee conducts a risk assessment for each chemical or product not specifically allowed for use under this permit and the Permittee submits the risk assessment to Ecology for review and approval. This risk assessment evaluates the active ingredient independent of any risk assessment performed by EPA during the registration process and is specific to Washington State conditions. The risk assessment must:~~

~~a. Be prepared by a ***qualified toxicologist***.~~

~~b. Include, at a minimum:~~

~~i. Qualifications of the toxicologist(s) who prepared the risk assessment.~~

ii. Verification that the chemical or product will meet the conditions and prohibitions of this permit.

iii. Information about the human health effects of the chemical or product acquired since the issuance of EPA's most recent risk assessment of the active ingredient.

iv.i.A summary and assessment of any peer-reviewed literature about the chemical or product published after the issuance of EPA's most recent risk assessment for the chemical or product.

All

v. S10available environmental and ecological information and the environmental fate and effects information about the chemical or product.

vi. Mitigation measures for the use of the chemical or product.

c. Be approved by Ecology.

B. Public Notification Procedures

After Ecology's approval of the risk assessment, Ecology will notify the public by publishing a notice about the risk assessment in the state register and by posting the notice on Ecology's website. The notice will provide the following information:

1. The chemical or product name and brand name(s), if applicable.

2. The expected uses of the chemical or product.

3. A summary of the expected environmental and human health effects.

4. How to obtain copies of the risk assessment.

5. How to comment on the proposed use of the chemical or product within the 30-day comment period.

6. Where to submit comments to Ecology about the risk assessment.

C. Approval of a New Product

1. Based on any additional valid scientific information provided during the public comment period, Ecology may either grant, condition, or deny approval for the use of the new chemical or product.

2. Following approval, Ecology may modify this permit to condition the chemical or product's use.

~~S11~~. S10. APPENDICES

The attached appendices are incorporated by reference into this permit and are subject to enforcement.

1. APPENDIX A: Glossary

~~2. APPENDIX B: Public Notice Template~~

~~3. APPENDIX C: Business and Residential Notice Template~~

~~4. APPENDIX D: Posting Notice Template~~

GENERAL CONDITIONS

G1. DISCHARGE VIOLATIONS

All discharges and activities authorized by this general permit must be consistent with the terms and conditions of this permit. The discharge of any pollutant more frequently than, or at a concentration in excess authorized by this permit, constitutes a violation of the terms and conditions of this permit.

G2. PROPER OPERATION AND MAINTENANCE

The Permittee must at all times properly operate and maintain all facilities or systems of treatment and control which are installed to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a Permittee only when the operation is necessary to achieve compliance with the conditions of this permit. The Permittee must not allow concentrations of the product(s) to exceed label or permit conditions.

G3. RIGHT OF ENTRY

The Permittee must allow an authorized representative of Ecology, upon the presentation of credentials and such other documents as may be required by law, at reasonable times:

A. To enter upon the premises where a discharge is located or where any records must be kept under the terms and conditions of this permit;

B. To have access to and to copy any records that must be kept under the terms of the permit;

C. To inspect any postings, monitoring equipment, or method of monitoring required in this permit;

D. To inspect any collection, treatment, pollution management, or discharge facilities; and

E. To sample any discharge of pollutants.

G4. PERMIT COVERAGE REVOCATION

Pursuant with chapter 43.21B RCW and chapter 173-226 WAC, the Director may require any discharger authorized by this permit to apply for and obtain coverage under an individual permit or another more specific and appropriate general permit. Cases where revocation of coverage may be required include, but are not limited to the following:

A. Violation of any term or condition of this general permit;

B. Obtaining coverage under this general permit by misrepresentation or failure to disclose fully all relevant facts;

C. Failure or refusal of the Permittee to allow entry as required in RCW 90.48.090;

D. A determination that the permitted activity endangers human health or the environment, or significantly contributes to water quality standards violations;

E. Nonpayment of permit fees or penalties assessed pursuant to RCW 90.48.465 and chapter 173-224 WAC;

F. Failure of the Permittee to satisfy the public notice requirements of WAC 173-226-130(5), when applicable; or Permittees who have had their coverage revoked for cause according to WAC 173-226-240 may request temporary coverage under this permit during the time an individual permit is being developed, provided that the request is made within ninety (90) days from the time of revocation and is submitted along with a complete individual permit application form.

G5. GENERAL PERMIT MODIFICATION AND REVOCATION

This permit may be modified, revoked and reissued, or terminated in accordance with the provisions of chapter 173-226 WAC. Grounds for modification or revocation and reissuance include, but are not limited to, the following:

A. When a change occurs in the technology or practices for control or abatement of pollutants applicable to the category of dischargers covered under this permit;

B. When effluent limitation guidelines or standards are promulgated pursuant to the Federal Water Pollution Control Act or chapter 90.48 RCW for the category of dischargers covered under this general permit;

C. When a water quality management plan containing requirements applicable to the category of dischargers covered under this general permit is approved; or

D.A. When information is obtained which indicates that cumulative effects on the environment from dischargers covered under this general permit are unacceptable.

G6. REPORTING A CAUSE FOR MODIFICATION

A Permittee who knows or has reason to believe that any activity has occurred or will occur which would constitute cause for revocation under condition G5 above, or 40 CFR 122.62 must report such plans or such information to Ecology so that a decision can be made on whether action to modify or revoke coverage under this permit will be required. Ecology may then require submission of a new application for coverage under this, or another general permit, or an application for an individual permit. Submission of a new application does not

relieve the Permittee of the duty to comply with all the terms and conditions of the existing permit until the new application for coverage has been approved and corresponding permit has been issued.

G7. TOXIC POLLUTANTS

The Permittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if this permit has not yet been modified to incorporate the requirement.

G8. OTHER REQUIREMENTS OF 40 CFR

All other applicable requirements of 40 CFR 122.41 and 122.42 are incorporated in this general permit by reference.

G9. COMPLIANCE WITH OTHER LAWS AND STATUTES

Nothing in this permit excuse the Permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations.

G10. ADDITIONAL MONITORING

Ecology may establish specific monitoring requirements in addition to those contained in this general permit by administrative order or permit modification.

G11. PAYMENT OF FEES

The Permittee must submit payment of fees associated with this permit as assessed by Ecology. Ecology may revoke this permit coverage or take enforcement, collection, or other actions, if the permit fees established under chapter 173-224 WAC are not paid.

G12. REQUESTS TO BE EXCLUDED FROM COVERAGE UNDER A GENERAL PERMIT

Any discharger authorized by this permit may request to be excluded from coverage under this general permit by applying for an individual permit. The discharger must submit to the Director an application as described in WAC 173-220-040 or WAC 173-216-070, whichever is applicable, with reasons supporting the request. These reasons must fully document how an individual permit will apply to the applicant in a way that the general permit cannot. Ecology may make specific requests for information to support the request. The Director may either issue an individual permit or deny the request with a statement explaining the reason for the denial. When an individual permit is issued to a discharger otherwise subject to this general permit, the applicability of this general permit to that Permittee is automatically terminated on the effective date of the individual permit.

~~G13. TRANSFER OF PERMIT COVERAGE~~

~~Coverage under this general permit is automatically transferred to a new Permittee if:~~

~~A. The Permittee notifies Ecology at least 30 days in advance of the proposed transfer date.~~

~~B. The notice includes a written signed agreement between the existing and new Permittees containing a specific date for transfer of permit responsibility, coverage, and liability between them.~~

~~C. The Department does not notify the existing Permittee and the proposed new Permittee of its intent to modify or revoke permit coverage.~~

~~G14. PENALTIES FOR VIOLATING PERMIT CONDITIONS~~

~~Any person who is found guilty of willfully violating the terms and conditions of this permit is deemed guilty of a crime, and upon conviction thereof must be punished by a fine of up to ten thousand dollars ($10,000) and costs of prosecution, or by imprisonment in the discretion of the court. Each day upon which a willful violation occurs may be deemed a separate and additional violation.~~

~~Any person who violates the terms and conditions of a waste discharge permit will incur, in addition to any other penalty as provided by law, a civil penalty in the amount of up to ten thousand dollars ($10,000) for every such violation. Each and every violation is a separate and distinct offense, and in case of a continuing violation, every day's continuance shall be deemed to be a separate and distinct violation.~~

~~G15.~~ **G1. SIGNATORY REQUIREMENTS**

All applications, reports, or information submitted to Ecology must be signed and certified.

A. In the case of corporations, by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

1. A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision making functions for the corporation, or

2. The manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

B. In the case of a partnership, by a general partner.

C. In the case of sole proprietorship, by the proprietor.

A. In the case of a municipal, state, or other public facility, ~~all permit applications must be signed by a principal executive officer or ranking elected official. In the case of a corporation, partnership, or sole proprietorship, all permit applications must be signed~~ by either a principal executive officer or ranking elected official~~of at least the level of vice president of a corporation, a general partner of a partnership, or the proprietor of a sole proprietorship~~.

B. All reports required by this permit and other information requested by Ecology must be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

1. The authorization is made in writing by the~~a~~ person described above and is submitted to Ecology at the time of authorization, and~~.~~

~~2.~~ The authorization specifies either ~~an individual or a position having responsibility for overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. (A duly authorized representative may thus be either~~ a named individual or any individual occupying a named position.~~.)~~

C. Changes to authorization. If an authorization under paragraph E~~B.2~~ above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, ~~environmental matters,~~ a new authorization ~~satisfying the requirements of paragraph B.2~~ must be submitted to Ecology prior to or together with any reports, information, or applications to be signed by an authorized representative.

D. ~~Certification.~~ Any person signing a document under this section must make the following certification:

"I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine~~fines~~ and imprisonment for knowing violations."~~.~~

G2. RIGHT OF ENTRY AND INSPECTION

Representatives of Ecology must have the right to enter at all reasonable times in or upon any property, public or private, for the purpose of inspecting and investigating conditions relating to the pollution or the possible pollution of any waters of the state.

Reasonable times include normal business hours; hours during which production, treatment, or discharge occurs; or times when Ecology suspects a violation requiring immediate inspection.

Representatives of Ecology must be allowed to have access to, and copy at reasonable cost, any records required to be kept under ~~G16. APPEALS~~

~~The~~ terms and conditions of the ~~Aquatic Invasive Species Management general~~ permit; to inspect any monitoring equipment or method required in the permit; and to sample any discharge, waste treatment processes, or internal waste streams.

G3. PERMIT ACTIONS

This permit may be modified, revoked and reissued, or terminated either at the request of any interested person (including the Permittee) or upon Ecology's initiative. However, the permit may only be modified, revoked and reissued, or terminated for the reasons specified in 40 CFR 122.62, 122.64 or WAC 173-220-150 according to the procedures of 40 CFR 124.5.

A. The following are causes for terminating permit coverage during its term, or for denying a permit renewal application:

~~subject to appeal. There~~

Violation of any permit term or condition.

1. Obtaining a permit by misrepresentation or failure to disclose all relevant facts.

A material change in quantity or type of waste disposal.

2. A determination that the permitted activity endangers human health or the environment or contributes to water quality standards violations and can only be regulated to acceptable levels by permit modification or termination [40 CFR part 122.64(3)].

A change in any condition that requires either a temporary or permanent reduction or elimination of any discharge or sludge use or disposal practice controlled by the permit [40 CFR part 122.64(4)].

Nonpayment of fees assessed pursuant to RCW 90.48.465.

3. Failure or refusal of the Permittee to allow entry as required in RCW 90.48.090.

B. The following are causes for modification but not revocation and reissuance except when the Permittee requests or agrees:

1. A material change in the condition of the waters of the state.

New information not available at the time of permit issuance that would have justified the application of ~~two~~ different permit conditions. ~~appeal categories.~~

2. Material and substantial alterations or additions to the permitted facility or activities which occurred after this permit issuance.

Promulgation of new or amended standards or regulations having a direct bearing upon permit conditions, or requiring permit revision.

3. The Permittee has requested a modification based on other rationale meeting the criteria of 40 CFR Part 122.62.

4. Ecology has determined that good cause exists for modification of a compliance schedule, and the modification will not violate statutory deadlines.

5. Incorporation of an approved local pre-treatment program into a municipality's permit.

C. The following are causes for modification or alternatively revocation and reissuance:

1. Cause exists for termination for reasons listed in A1 through A7, of this section, and Ecology determines that modification or revocation and reissuance is appropriate.

2. Ecology has received notification of a proposed transfer of the permit. A permit may also be modified to reflect a transfer after the effective date of an automatic transfer but will not be revoked and reissued after the effective date of the transfer except upon the request of the new Permittee.

G4. REPORTING PLANNED CHANGES, CAUSE FOR MODIFICATION

The Permittee must, as soon as possible, but no later than sixty (60) days prior to the proposed changes, give notice to Ecology of planned physical alterations or additions to the permitted facility, production increases, or process modification which will result in:

A. The permitted facility being determined to be a new source pursuant to 40 CFR 122.29(b).

B. A significant change in the nature or an increase in quantity of pollutants discharged.

C. A significant change in the Permittee's sludge use or disposal practices.

Following such notice, and the submittal of a new application or supplement to the existing application, along with required engineering plans and reports, this permit may be modified, or revoked and reissued pursuant to 40 CFR 122.62(a) to specify and limit any pollutants not previously limited. Until such modification is effective, any new or increased discharge in excess of permit limits or not specifically authorized by this permit constitutes a violation.

G5. PLAN REVIEW REQUIRED

A. Prior to constructing or modifying any wastewater control facilities, an engineering report and detailed plans and specifications must be submitted to Ecology for approval in accordance with WAC 173-240. Engineering reports, plans, and specifications must be submitted at least one hundred eighty (180) days prior to the planned start of construction unless a shorter time is approved by Ecology. Facilities must be constructed and operated in accordance with the approved plans.

G6. COMPLIANCE WITH OTHER LAWS AND STATUTES

Nothing in this permit must be construed as excusing the Permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations.

G7. TRANSFER OF THIS PERMIT

In the event of any change in control or ownership of facilities from which the authorized discharge emanate, the Permittee must notify the succeeding owner or controller of the existence of this permit by letter, a copy of which must be forwarded to Ecology. This permit is automatically transferred to a new owner or operator if:

A. A written agreement between the old and new owner or operator containing a specific date for transfer of permit responsibility, coverage, and liability is submitted to Ecology;

B. A copy of the permit is provided to the new owner and;

C. Ecology does not notify the Permittee of the need to modify the permit.

Unless this permit is automatically transferred according to section A. above, this permit may be transferred only if it is modified to identify the new Permittee and to incorporate such other requirements as determined necessary by Ecology.

G8. REDUCED PRODUCTION FOR COMPLIANCE

The Permittee, in order to maintain compliance with its permit, must control production and/or all discharges upon reduction, loss, failure, or bypass of the treatment facility until the facility is restored or an alternative method of treatment is provided. This requirement applies in the situation where, among other things, the primary source of power of the treatment facility is reduced, lost, or fails.

G9. REMOVED SUBSTANCES

Collected screenings, grit, solids, sludge, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters must not be resuspended or reintroduced to the final effluent stream for discharge to state waters.

G10. DUTY TO PROVIDE INFORMATION

The Permittee must submit to Ecology, within a reasonable time, all information which Ecology may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Permittee must also submit to Ecology upon request, copies of records required to be kept by this permit.

G11. OTHER REQUIREMENTS OF 40 CFR

All other requirements of 40 CFR 122.41 and 122.42 are incorporated in this permit by reference.

G12.ADDITIONAL MONITORING

Ecology may establish specific monitoring requirements in addition to those contained in this permit by administrative order or permit modification.

G13. PAYMENT OF FEES

The Permittee must submit payment of fees associated with this permit as assessed by Ecology. Ecology may revoke this permit if the permit fees established under WAC 173-224 are not paid.

~~A. The permit terms and conditions as they apply to the appropriate class of dischargers are subject to appeal within thirty (30) days of issuance of this general permit in accordance with chapter 43.21(B) RCW and chapter 173-226 WAC; and~~

~~The applicability of the permit terms and conditions to an individual discharger are subject to appeal in accordance with chapter 43.21(B) RCW~~

G14.PENALTIES FOR VIOLATING PERMIT CONDITIONS

Any person who is found guilty of willfully violating the terms and conditions of this permit is deemed guilty of a crime, and upon conviction thereof will be punished by a fine of up to ten thousand dollars

($10,000) and costs of prosecution, or by imprisonment in the discretion of the court. Each day upon which a willful violation occurs is a separate and additional violation. Any person who violates the terms and conditions of a waste discharge permit incurs, in addition to any other penalty as provided by law, a civil penalty in the amount of up to ten thousand dollars ($10,000) for every such violation. Each and every such violation is a separate and distinct offense, and in case of a continuing violation, every day's continuance is deemed to be a separate and distinct violation.

G15. UPSET

Definition – "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limits because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limits if the requirements of the following paragraph are met. A Permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that: 1) an upset occurred and that the Permittee can identify the cause(s) of the upset; 2) the permitted facility was being properly operated at the time of the upset; 3) the Permittee submitted notice of the upset as required in condition S9.D; and 4) the Permittee complied with any remedial measures required under S9.D of this permit. In any enforcement proceedings the Permittee seeking to establish the occurrence of an upset has the burden of proof.

G16. PROPERTY RIGHTS

This permit does not convey any property rights of any sort, or any exclusive privilege.

G17. DUTY TO COMPLY

The Permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

G18. TOXIC POLLUTANTS

The Permittee must comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if this permit has not yet been modified to incorporate the requirement.

G19. PENALTIES FOR TAMPERING

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit will, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two years per violation, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this Condition, punishment will be a fine of not more than $20,000 per day of violation, or by imprisonment of not more than four (4) years, or by both.

G20. COMPLIANCE SCHEDULES

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than

fourteen (14) days following each schedule date.

G21. REPORTING ANTICIPATED NON-COMPLIANCE

~~B.~~ The Permittee shall give advance notice to Ecology by submission of a new application, or supplement to the existing application, at least 45 days prior to commencement of such discharges, of any facility expansions, production increases, or other planned changes, such as process modifications, in the permitted facility or activity which may result in noncompliance with permit limits or conditions. Any maintenance of facilities, which might necessitate unavoidable interruption of operation and degradation of effluent quality, ~~within thirty (30) days of the effective date of coverage of that discharger.~~

~~An appeal of the coverage of the Aquatic Invasive Species permit to an individual discharger is limited to the applicability or non-applicability of the Aquatic Invasive Species to that same discharger. Appeal of this permit coverage of an individual discharger will not affect any other individual dischargers. If the terms and conditions of Aquatic Invasive Species general permit are found to be inapplicable to any discharger(s), the matter shall be remanded to Ecology for consideration of issuance of an individual permit or permits.~~

~~G17.~~shall be scheduled during non-critical water quality periods and carried out in a manner approved by Ecology.

G22. ~~SEVERABILITY~~

~~The provisions of this general permit are severable, and if any provision of this general permit, or application of any provision of this general permit to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this general permit shall not be affected thereby.~~

~~G18.~~ DUTY TO REAPPLY

The Permittee must reapply for coverage under this general permit at least one hundred and eighty (180) days prior to the specified expiration date of this general permit. An expired general permit and coverage under the permit continues in force and effect until Ecology issues a new general permit ~~(coverage)~~ or until Ecology cancels it. Only those Permittees~~government entities~~ that reapply for coverage ~~under this permit~~ are covered under the continued permit.

APPENDIX A - GLOSSARY

All definitions listed below are for use in the context of this permit only.

303(d)-)-listed water body: Section 303(d) of the federal CWA requires states to develop a list of polluted water bodies every two years. For each of those water bodies, the law requires states to develop Total Maximum Daily Loads (TMDLs). A TMDL is the amount of pollutant loading that can occur in a given water body (river, marine water, wetland, stream, or lake) and still meet water quality standards.

Adopt: Permittees may choose to use an existing adaptive management plan for organisms treated under this permit as long as Ecology has approved and accepted the plan. For example, if WDFW has an Ecology-approved adaptive management plan for tunicate treatment, WDNR may choosechose to follow this plan rather than developing a new plan. The adopted plan must include the treatment proposed by WDNR.

Algae: Primitive, chiefly aquatic, one-celled or multicellular plant-like organisms that lack true stems, roots, and leaves but usually contain chlorophyll.

Algaecide: A chemical compound that kills or reduces the growth of algae

Allows: Permitted in compliance with the terms and conditions of this permit.

All Known and Reasonable Technologies (AKART): All known, available, and reasonable methods of pollution control and prevention as described in 90.48.010, 90.48.520, 90.52.040, and 90.54.020 RCW and 173-201A-020, 173-204-120, 173-204-400, 173-216-020, 173-216-050, 173-216-110, 173-220-130 WAC .

Application schedule: The proposed treatment date(s) for a specific water body during one treatment season.

Constructed water body: An artificial water body excavated in an area that is not part of a previously existing watercourse (such as a pond, stream, or wetland, etc.).

Control: Any type of chemical treatment intended to remove nonnative invasive organisms from a water body or area of a water body.

Discharge: The addition of any pollutant to a water of the state.

Emergencies: A situation where an immediate response (i.e. same day response) is needed to prevent reproduction or the rapid spread of an invasive species (example: zebra mussels). Incidents where rapid and early intervention is crucial to a successful management effort constitute an emergency. Examples include, but are not limited to, needing to treat species immediately to preclude or limit spawning or reproduction (tunicates). Timing is critical in these situations.

Endangered Species: Any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary to constitute a pest whose protection under the provisions of this Act would present an overwhelming and overriding risk to man.

Experimental Use Permit: Federal and state permits that allow the use of unregistered pesticides in the context of research and development for registration of the pesticide under FIFRA Section 3, or in the context of research and development for registration of a new use of a currently registered pesticide under FIFRA Section 3. See 40 CFR 172, 15.58.405 RCW, and WAC 16-228-1460.
~~228-1460.~~

~~*FIFRA*: Federal Insecticide, Fungicide, and Rodenticide Act.~~

Herbicide: A chemical designed to control or kill plants.

Highly populated area: An area where many people live or recreate.

High use area: An area heavily used by the public or the community. Examples include: A popular picnic area, boat launch, or a public or community swimming beach.

Hours or days: As related to the short-term modification section of Washington's Water Quality Standards for Surface Waters of the State of Washington. Hours or days means up to 13.9 days (see also WAC 173-201A-410).

Indian Country: Means as defined in 18 USC 1151: "Except as otherwise provided in sections 1154 and 1156 of this title, the term ''Indian country'', as used in this chapter, means (a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation, (b) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same."

Insecticide: A chemical used to prevent, repel, control, or kill insects.

~~*Integrated Pest Management Plan*: An ecologically based strategy for pest control that incorporates monitoring, biological, physical, and chemical controls in order to manage pests with the least possible hazard to humans, environment, and property. IPM considers all available control actions, including no action. Pesticide use is only one control action.~~

Limiting: Restricting - treating only what is necessary to remove an invasive species or restricting treatment to times when the public is least impacted (e.g. weekdays).

Material safety data sheet (MSDS): Information sheet that contains details of the hazards associated with a chemical and gives information on its safe use.

Molluscicides: Chemicals used to kill mollusks (such as snails).

NOI: Notice of Intent (to apply for coverage). This is a term used to describe the completed application form.

Non-governmental organizations: Entities such as the Nature Conservancy that may have a role in managing nonnative invasive species. Many non-governmental organizations are non-profit.

Nonnative invasive: An organism outside of its natural or historical range of distribution that tends to spread and dominate new areas. Organisms considered to be nonnative were not present in Washington prior to European settlement. Many nonnative organisms are not invasive or problematic.~~*No reasonable public or private access*: Sites with limited ability for people access the area or sites where people do not tend to use the area. This may include isolated wetland areas with no public or private paths or similar such sparsely inhabited or visited areas.~~

Organisms: Any life form considered as an entity; an animal, plant, fungus, protistan, or moneran.

Permittee: Any state government entity that applies for and gains coverage under this permit and has control of, or causes a discharge under coverage of this permit.

Pesticide: "Pesticide" means, but is not limited to: Any substance or mixture of substances intended to prevent, destroy, control, repel, or mitigate any insect, rodent, snail, slug, fungus, weed, and any other form of plant or animal life or virus, except virus on or in a living person or other animal which is normally considered to be a pest or which the director (of Agriculture) may declare to be a pest (RCW 17.21.020).

Piscicides: Chemicals used to kill fish.

Potentially invasive: A nonnative organism that has a possibility of spreading and dominating new areas, displacing native species.

Private applicators: Individuals applying pesticides. Licensed applicators hold a license from the Washington Department of Agriculture. Aquatic applications for some chemicals or products require a state-licensed applicator.

Privately or publicly-owned shorelines: Any shoreline area without public access, owned by either an individual or a public entity.

~~*Prohibited or unlisted marine animals*: Animals identified in WAC 220-12-090. WDFW regulates these animals.~~

Public access: Identified legal passage to any of the public waters of the state, assuring that members of the public have access to and use of public waters.

Public Entrances: Areas such as public parking lots where numerous people can access public pathways. Although the public may be able to access public pathways at multiple locations, the Permittee must post two foot by three foot signs only in the areas where many people routinely access the pathway.

Public pathways: Identified legal passage along the shoreline of a water body. Public pathways may include walkways along the shorelines of lakes or rivers.

~~*Qualified toxicologist:* A person with a Ph.D in toxicology or in a health or ecological science with an emphasis in toxicology, or a person with a Master's degree in toxicology or a related science with an emphasis in toxicology, who is working in the field of toxicology.~~

~~*Rapid response situations*: Incidents where rapid and early intervention is crucial to a successful management effort. Examples include, but are not limited to, needing to treat species immediately to preclude or limit spawning or reproduction (tunicates). Timing is critical in these situations.~~

Recreational restriction: A recreational restriction limits direct water contact (e.g. swimming, water skiing, wading, etc.) for a specified time period in the treated area or for the entire lake, depending on the chemical or product used.

Seasonally dry land surfaces: An area that may be wet or contain standing water in the rainy season, but is dry during other times of the year. When dry, there must be no standing water present in the treatment area and the soils must not be saturated. Tidal lands do not meet the definition of seasonally dry land surfaces.

Sensitive, threatened, or endangered species – Washington State-Species of Concern:

Sensitive: Any taxon that is vulnerable or declining and could become endangered or threatened in the state without active management or removal of threats.

Threatened: Any taxon likely to become endangered in Washington within the foreseeable future if factors contributing to its population decline or habitat degradation or loss continue.

Endangered: Any taxon in danger of becoming extinct or extirpated from Washington within the foreseeable future if factors contributing to its decline continue. Populations of these taxa are at critically low levels or their habitats have been degraded or depleted to a significant degree.

Shoreline: The area where water and land meet.

~~*Short duration application*: Washington's Water Quality Standards limit a short-term water quality exceedance to hours or days for a specific application.~~

~~*Small water body*: A water body generally 150 acres or less in size.~~

Surface waters of the state of Washington: Freshwaters (lakes, rivers, ponds, streams, inland waters), brackish waters, marine waters, estuarine waters, and all other above ground waters and water courses within the jurisdiction of the state of Washington.

Take: Per Section 3 of the Endangered Species Act means to harass, harm, pursue, hunt, shoot, wound, kill,

trap, capture, or collect, or to attempt to engage in any such conduct.

Threatened Species: Any~~*and endangered aquatic*~~ *species* which is ~~*federal:*~~

~~*Threatened:* An animal species~~ likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. http://www.fws.gov/endangered/, http://www.noaa.gov/fisheries.html

~~*Endangered:* An animal species in danger of extinction throughout all or a significant portion of its range.~~ http://www.fws.gov/endangered/, http://www.noaa.gov/fisheries.html

Treatment area: The area where the chemical is applied and the concentration of the chemical is adequate to cause the intended effect on targeted organisms.

Upland farm pond: Private farm ponds created from upland sites that did not incorporate natural water bodies (WAC 173-201A-260(3)(f)).

~~*Vicinity:* Immediate area around a treatment site.~~

Volatile Organic Compound (VOC): EPA defines any volatile compound of carbon as a VOC for regulatory purposes, unless it appears on a list of compounds that have been specifically exempted. EPA periodically exempts compounds. *See* 40 CFR 51.100 (s).

Washington State government agencies: Washington state government agencies such as Washington Departments of Fish and Wildlife, Natural Resources, Agriculture, etc. Does not include local governments.

Wetland: Any area inundated with water sometime during the growing season and identified as a wetland by a local, state, or federal agency.

~~*Worst case scenario*: A sampling location where the concentration of the chemical or product is expected to be the highest, or the location where the measured parameter is expected to be most affected by the treatment.~~

In the absence of other definitions set forth herein, the definition as set forth in 40 CFR Part ~~403.3~~ 403.3 or in chapter 90.48 RCW shall be used for circumstances concerning discharges.

APPENDIX B – PUBLIC NOTICE TEMPLATE

The words in italics are guidance for the Permittee. Remove italicized words before printing notice.

The Permittee must publish this notice **once** each week for **two** consecutive weeks, in a **single** newspaper of general circulation in the county in which the chemical treatment is to take place. The non-italicized language is required by WAC 173-226-130 and must be included as part of the public notice in its entirety. Information may be added to this template, but no information may be removed or changed.

PUBLIC NOTICE TEMPLATE

(*Applicant Name*) is seeking coverage under the NPDES Waste Discharge General Permit for Aquatic Invasive Species Management. (*Applicant Name*) is located at (*Applicant Address and Phone Number*).

This general permit covers the application of chemicals or products to fresh and marine waters anywhere in the state of Washington for the management of nonnative aquatic invasive animals and nonnative invasive marine algae. The permit limits, conditions, and regulates the application of allowed chemicals.

Any person desiring to present their views to the Department of Ecology regarding this application must do so in writing within 30 days of the last date of publication of this notice. Comments must be submitted to the Department of Ecology. Any person interested in the Department's action on the application may notify the Department of their interest within 30 days of the last date of publication of this notice.

Submit comments to:

Department of Ecology
Water Quality Program
Attn: Aquatic Invasive Species Management Permit Manager
P.O. Box 47600
Olympia, WA 98504-7600

APPENDIX C – BUSINESS AND RESIDENTIAL NOTICE TEMPLATE

The words in italics are guidance for the Permittee. Remove italicized words before printing notice.

Other template language must be included as part of the Business and Residential Notice in its entirety. Information may be added to this template, but no information may be removed or changed.

BUSINESS and RESIDENTIAL NOTICE TEMPLATE

Business and Residential Notice
Chemical Treatment
For
(Name of the target organism(s)

Distribution Date: *(Date that this notice was distributed)*

(Permittee) will treat *(water body proposed for treatment)* on/or between *(list treatment dates). If the Permittee plans more than one treatment per season, provide additional treatment dates here.*

Product(s) planned for use: *(List trade name(s) and active ingredient(s)here)*

Location of treatment(s): *(Specify locations within the water body – Permittee may attach a treatment map to the notice)*

(Permittee) will post signs in treated and potentially affected areas up to 72 hours before application. The signs will describe any water use restrictions or advisories.

(Include the following statement ONLY for freshwater projects with water use restrictions):

If you are withdrawing water for potable or domestic water use, livestock watering, or irrigation, and have no alternate water source, please contact *(Permittee)* at *(phone number)* or *(e-mail)* to arrange an alternate water supply.

If you would like to request additional notification prior to treatment, or have further questions, please contact *(Permittee)* at *(phone number)* or *(e-mail)*.

Washington Department of Ecology regulates this treatment under an Aquatic Invasive Species National Pollutant Discharge Elimination System Permit.

Additional information about this project: Optional

The Permittee may attach additional information to the Business and Residential Notice. This may include:

- ~~Information about why the project is necessary.~~
- ~~Information about the targeted species~~
- ~~Photographs of the targeted species.~~
- ~~Chemical information.~~
- ~~Other pertinent facts about the project.~~
- ~~Additional contact information, websites, etc.~~

APPENDIX D - POSTING TEMPLATES

The words in italics are guidance for the Permittee. Remove italicized words before printing notice.

Do NOT alter font size.

CAUTION

(Chemical Name) will be applied under permit to these waters on *(Date)* to manage *(Name of targeted species)*.

Permittee to choose ***one*** *of the selections below – depending on use advisories or restrictions on the label on in the permit:*

(1) There are no swimming or recreation restrictions or advisories when using this product.

(2) Use advisories: It has been advised that *(List use advisories (such as no swimming)* occur within the treated area during or for *(List any time restrictions (such as for 24 hours)* following treatment.

(3) Use Restrictions: No contact recreation (wading, swimming, waterskiing, etc.) in the treatment area during and for 24 hours following treatment.

Permittee to put any additional label restrictions or advisories below. If there are no restrictions put none

Potable Water Restrictions:

~~Irrigation Restrictions:~~

~~Fishing Restrictions:~~

~~Stock Watering Restrictions:~~

~~For more information contact the Permittee: *(Permittee Name)*~~
~~Phone number: *(Permittee phone number)*~~

~~The Department of Ecology regulates this activity under an NPDES permit. For information about the permit, contact Ecology Phone number: *(Use phone number of the current Pesticide Permit Manager assigned to oversee this permit)*~~

~~THIS SIGN MUST REMAIN IN PLACE UNTIL 2 DAYS AFTER APPLICATION~~

WASHINGTON STATE
RECREATION AND CONSERVATION OFFICE
Washington Invasive
Species Council

Washington Invasive Species Council Briefing Memo

Meeting Date: March 3rd, 2016

Title: Top 50 Species Prioritization Process

Summary: Proposal on how to proceed with updating the WISC priority species list.

Background

On January 21st 2016 a WISC subgroup met to discuss how to proceed with updating the WISC priority species list. The group developed the following proposal for on updating our priotiry species list for WISC consideration. The prioritization work group included:

Alison Halpern, Washington State Noxious Weed Control Board
Lizbeth Seebacher, Department of Ecology
Ray Willard, Department of Ecology
Wendy Brown, Recreation and Conservation Office
Greg Haubrich, Department of Agriculture

Objective

Due to changes in invasive species distribution, identification of new threats and management progress – there is a need to update the WISC Priorty Species List. The list helps guide managemnet priorities but primarily help provide focus for the council's prevention, education and outreach work. Keeping the list up-to-date is essential to retaining its relevance and utility.

Frequency

The list should be updated in conjunction with our reauthorization and the update of our strategic plan; on a 5 year schedule. The five year update frequency will ensure that the list remains reflective of current threats AND provides some level of consistancy for outreach porposes. We want the public to be able to easily learn and keep track of what species are priorities in Washington State.

Number of Species

The list should remain restricted to the top 50 invasives. The 50 species limit is intended to focus our list on the worst of the worst. Our top 50 list was never intended to be comprehensive but provide focus and put emphasis on the most significant threats.

WASHINGTON STATE
RECREATION AND CONSERVATION OFFICE
Washington Invasive
Species Council

Washington Invasive Species Council Briefing Memo

Process

In 2008, when the council first set our list of priority species, we established a comparative analysitical tool which allowed us to quantify threat level and management capacity to measure species against one another. The ranking system evaluates the impacts and potential invasiveness of invasive species to our natural areas, natural resource-based industries, and public health. The ranking system was designed to be robust and transparent and incorporated components from other still-relevant assessment models (e.g., Invasiveness Ranking System for Non-native Plants in Alaska, California Invasive Plant Inventory, etc.). The worksheet below was developed as a part of the comparative analytical process:

Species/Guild Name:

Through the Gate?	Here	Near	Far
Summary of Scores			
		Potential Max.	**Score**
Ecological Impacts		*40*	
Economic Impacts		*40*	
Human Health Impacts		*10*	
Invasive Potential		*33*	
Difficulty of Control		*10*	
TOTAL IMPACT		*133*	
Feasibility of Prevention/Early Action		*50*	

Number of 'Unknown' Scores Recorded:
Level of Certainty in Assessment: High Medium Low

In 2008, the above score-sheet was filled out for each species. The 50 species with the highest impacts and invasive potential were selected to be on the list. Review of the comparative analytical tool has found that it is still the best suited tool for selecting species for our top 50 list. It provides the level of depth that the council is looking for and allows scoring to remain consistant.

It is proposed that during 2016 the WISC reinitiate this species ranking process in order to update our top 50 list. Nominations for additional species and for species to be removed from the list shall be solicited and the WISC will establish three working groups to re-evaluate species in three categories; inects, animals and plants. The working group proposes the following timeline for this process.

WASHINGTON STATE
RECREATION AND CONSERVATION OFFICE
Washington Invasive
Species Council

Washington Invasive Species Council Briefing Memo

Timeline

March 3rd 2016	The Prioritzation Workgroup will present this proposal to the rest of the WISC at our quarterly meeting
March 14th – March 18th 2016	First workgroup meetings (insect, plant, animal) will be held to establish: 1) a list of experts to send solicitations for nominations and 2) a list of potential workgroup members
March 21st 2016	Solicitation will be sent to for nominations to add to or remove species from the top 50 list.
April 29th 2016	Deadline for nominations
June 16th 2016	The WISC will review nominations at our quarterly meeting
July – August 2016	Work groups will meet to score species
September 22nd 2016	Work groups will report back on the outcomes of scoring at quarterly WISC meeting.
December 1st 2016	Updated priority species list adopted

WASHINGTON STATE
RECREATION AND CONSERVATION OFFICE
Washington Invasive Species Council

Invasive Species Impact and Prevention/Early Action Assessment Tool

Species/Guild Name:

Through the Gate?	Here	Near	Far

Summary of Scores

	Potential Max.	Score
Ecological Impacts	*40*	
Economic Impacts	*40*	
Human Health Impacts	*10*	
Invasive Potential	*33*	
Difficulty of Control	*10*	
TOTAL IMPACT	*133*	
Feasibility of Prevention/Early Action	*50*	

Number of 'Unknown' Scores Recorded:
Level of Certainty in Assessment: High Medium Low

Invasive species – plants, animals, insects, and pathogens – are a threat to Washington's environment and economy, exacting a high price for their presence. These biological invaders can produce serious, often irreversible effects on our natural resources and natural resource-based industries; they may also harm the health of humans and livestock. While not all non-native species have aggressive or harmful traits, the sheer number of these species coming through our gates increases the risk of significant adverse impacts. With limited resources available to manage this problem, agencies and stakeholders must be strategic in their approach.

In response to this increasing threat, the Washington Invasive Species Council has developed a ranking system to evaluate the impacts and potential invasiveness of invasive species to our natural areas, natural resource-based industries, and public health. This ranking system has been designed to be a robust and transparent procedure to aid the Council in (1) **identifying the most problematic invasive species in or near to the state** and (2) **prioritizing Council actions**. We created an impact assessment process by incorporating components from other assessment models (e.g., Invasiveness Ranking System for Non-native Plants in Alaska, California Invasive Plant Inventory), in which species are ranked by a series of questions in five broad categories: ecological impacts, economic impacts, human health impacts, invasive potential, and difficulty of control. In addition, in keeping with the Council's strategic focus on prevention and early detection and rapid response as identified in *Invaders at the Gate*, we have included a separate assessment of how feasible it would be for Washington state agencies to take preventive measures or be effective with early action for a species.

The first three sections of the impact assessment pertain to the severity of a species' potential or actual impact on the natural environment, natural-resource based industries, and human health. These impacts may have been observed occurring in Washington or, if not yet here, in another state or region. The Invasive Potential section focuses on a species' biological characteristics associated with its potential to disperse, spread, and flourish into and within a new area. The questions in this section provide a measure of a species' potential to be invasive. The fifth section, Difficulty of Control, measures the financial and human investment needed to control a species. **A higher total impact score corresponds to a greater detrimental impact caused by a species.**

The second part of the assessment, the Current Ability to Prevent/Take Early Action section, asks questions related to entry and transport pathways, current distribution, and policy and outreach measures already in place to facilitate efforts to conduct prevention measures or an effective rapid response. **A higher score for Current Ability to**

Prevent/Take Early Action corresponds to a greater likelihood of Washington state agencies being able to effectively implement prevention measures or conduct early action on a species.

For most questions, scores range from 0 to 10 points. This numeric spread was adapted from Alaska's ranking system and chosen to highlight relative differences among species. Any score of 'unknown' is given a numeric score of 1 and incorporated into the overall score. The number of unknown responses are recorded and used to determine the level of certainty in the assessment (i.e., high, medium, low).

WORKSHEET

IS IT THROUGH THE GATE?

Here	Species has established populations in Washington.
Near	Species has established populations in western U.S. region and similar habitat exists in Washington or species has been identified entering Washington through pathways but is not yet established.
Far	Species has established populations in areas outside of western U.S. region that have climate conditions similar to Washington.

IMPACTS

A score of 'unknown' will be given a numeric score of 1.

1. ____ ECOLOGICAL IMPACT

____ Impact on ecosystem processes

A. No impact on ecosystem processes.	0
B. Influences ecosystem processes to a minor degree (e.g., has a perceivable but mild influence on soil nutrient availability).	3
C. Causes significant alteration of ecosystem processes (e.g., increases sedimentation rates along streams or coasts, reduces areas of open water important to waterfowl, alters water chemistry, alters rate of water retention, reduces ecosystem productivity).	7
D. Causes major, possibly irreversible, alteration or disruption of ecosystem processes (e.g., alters geomorphology, hydrology, or fire frequency; fixes substantial levels of nitrogen in the soil which favors non-native species).	10
U. Unknown	

Comments: _____

_____

_____

____ Impact on community composition, structure, and interactions

A. No impact on community composition, structure, and interactions.	0
B. Influences community composition, structure, and interactions (e.g., reduces the number of individuals in one or more native species).	3
C. Causes significant alteration of community composition, structure, and interactions (e.g., produces a significant reduction in the population size of one or more native species).	7
D. Causes major alteration in community composition, structure, and interactions (e.g., forms a complete monotype, results in the extirpation of one or more native species reducing biodiversity or changing composition towards exotic species).	10
U. Unknown	

Comments: _____

_____

_____

____ Impact on genetic integrity of native species/potential for hybridization

A. No impact on genetic integrity of native species/no potential for hybridization.	0
B. Known to hybridize with one or more native species and produce sterile offspring that lower the reproductive output of native species.	5
C. Known to hybridize with one or more native species and produce fertile offspring that can outcompete native species.	10
U. Unknown	

Comments: _____

_____

_____

____ Impact on federal or state species of concern (SOC) or high-value/rare ecological communities as defined by the Washington Natural Heritage Program

A. No impact on SOC or high-value/rare ecological communities.	0
B. Causes detrimental impact on SOC species or high-value/rare communities.	5
C. Causes extirpation of one or more SOC species or eradication of a high-quality/ rare ecological community.	10
U. Unknown	

Comments: _____

_____

_____

2. ____ ECONOMIC IMPACT

____ Impact on agricultural/aquaculture industry

A. No impact on agriculture or aquaculture.	0
B. Causes minor impact on agriculture or aquaculture (e.g., somewhat reduced production and crop yields, reduced forage for livestock).	3
C. Causes significant impact on agriculture or aquaculture (e.g., major reduction in production and crop yields, loss of livestock, loss of markets by contaminants, genetic integrity of crop species, damage to water diversion system).	7
D. Potential to shut-down portions of the industry (could be due to regulatory measure).	10
U. Unknown	

Comments: _____

_____

_____

____ Impact on forest products industry

A. No impact to forest products industry.	0
B. Causes minor impact to forest products industry (e.g., somewhat reduced timber and other forest products yields, small increase in susceptibility to fire).	3
C. Causes significant impact to forest products industry (e.g., major reduction in timber and other forest product yields, significant increase in susceptibility to fire).	7
D. Potential to shut-down portions of the industry (could be due to quarantine or other regulatory measure).	10
U. Unknown	

Comments: _____

_____

_____

____ Impact on physical infrastructure

A. No impact on physical infrastructure.	0
B. Causes minor impact on physical infrastructure (e.g., minor damage and/or impediments to dams, roads, railways, fences, power lines, flood control ditches, aquaculture equipment).	3
C. Causes significant impact on physical infrastructure (e.g., major damage and/or impediments to dams, roads, railways, power lines, aquaculture equipment).	7
D. Potential to render parts of physical infrastructure unusable, replacement costs would be extreme.	10
U. Unknown	

Comments: _____

_____

_____

____ Impact on recreational sector

A. No impact on recreational opportunities.	0
B. Causes detrimental impact on recreational opportunities (e.g., diminished opportunities for camping, biking, hiking, boating, fishing/shellfish gathering, birding, hunting).	5
C. Elimination of one or more recreational opportunities.	10
U. Unknown	

Comments: _____

_____

_____

3. ____ HUMAN HEALTH IMPACT

A. No impact on human health.	0
B. Causes physical injury (e.g., thorns, shells of zebra mussel) or provides habitat for a disease vector or organism.	5
C. Is a human disease vector or is a disease organism. May also cause individual mortality (e.g., accidental ingestion of poison hemlock, West Nile Virus).	10
U. Unknown	

Comments: _____

_____

_____

4. ____ INVASIVE POTENTIAL

____ Rate of spread with no management

A. Does not occur – species does not spread within suitable habitat.	0
B. Actual or potential slow rate of spread within suitable habitat.	3
C. Actual or potential moderate rate of spread within suitable habitat.	7
D. Actual or potential rapid rate of spread (doubling in < 10 years) within suitable habitat.	10
U. Unknown	

Comments: _____

_____

_____

____ Natural ability for dispersal beyond parent population

A. Does not occur.	0
B. Infrequent or inefficient dispersal (occurs occasionally despite lack of adaptations).	3
C. Efficient dispersal occurs but population remains within a natural boundary (such as a waterbody or natural area surrounded by human development).	7
D. Numerous opportunities for dispersal (species has ability to move across natural barriers or has adaptations such as wings or hooked fruit-coats that facilitate dispersal).	10
U. Unknown	

Comments: _____

_____

_____

____ Habitat specialization (How far-reaching can infestation become/potential distribution)

A. Highly specialized habitat requirements (species is found in only one ecotype or ecological niche).	0
B. Moderately specialized habitat requirements (species is found in 2-3 ecotypes or ecological niches).	5
C. General habitat requirements (species occupies a wide range of ecotypes or ecological niches).	10
U. Unknown	

Comments: _____

_____

_____

____ Other species in the genus invasive

A. No.	0
B. Yes.	3
U. Unknown	

Comments: _____

_____

_____

5. ____ DIFFICULTY OF CONTROL – LEVEL OF EFFORT REQUIRED

A. Management is not required (e.g., species does not persist).	0
B. Management is relatively easy and inexpensive; requires a minor investment in human and financial resources.	3
C. Management requires a major short-term investment of human and financial resources, or a moderate long-term investment.	7
D. Management requires a major, long-term investment of human and financial resources.	10
U. Unknown	

Comments: _____

_____

_____

Total Impact Score ____

CURRENT ABILITY TO PREVENT/TAKE EARLY ACTION

____ Potential for entry into and transport within Washington via human activities (both directly and indirectly – possible mechanisms include commercial sales, use as forage/ revegetation, aquaculture, biological supply, horticulture, transport on boats, etc.)

A. High - numerous pathways for entry into and transport within Washington exist and species is routinely identified traveling on these pathways.	0
B. Moderate - some entry into and transport pathways within Washington exist and species is occasionally identified on these pathways.	3
C. Low - entry and transport pathways are infrequent and inefficient.	7
D. Does not occur.	10
U. Unknown	

Comments:

____ Regulatory barriers to prevent entry into and transport within Washington

A. No or minor regulatory restrictions on organisms/host and no surveillance.	0
B. No or minor regulatory restrictions on organisms/host with surveillance.	3
C. Regulatory oversight on organisms/host with restricted trade.	5
D. Trade and/or transport of organisms/hosts illegal.	7
E. Strict prohibition on organisms/host and some infrastructure for interception.	10
U. Unknown	

Comments:

____ Current distribution in Washington

A. Widely distributed throughout state.	0
B. Regionally distributed.	3
C. More than one infestation known spread within one or multiple watersheds.	5
D. Isolated infestation, 1-3 known locations encompassing fewer than 50 acres.	7
E. Not present.	10
U. Unknown	

Comments:

____ Degree to which control is mandated

A. No regulatory barriers, voluntary control may or may not be encouraged.	0
B. Mandatory control at local level.	3
C. Mandatory containment of species where regionally established and mandatory control of species where not yet established.	7
D. Mandatory eradication of species.	10
U. Unknown	

Comments:

____ Current efforts for education and outreach

A. No education and outreach efforts are undertaken for this species.	0
B. Some education materials exist and passive outreach occurs (e.g., signs posted at public access points, information cards made available at public events).	3
C. Education materials exist and outreach occurs sporadically and/or after a new species or infestation is discovered.	7
D. Education and outreach materials and programs exist and are actively provided to targeted audiences before the species or a new infestation is discovered.	10
U. Unknown	

Comments: _____

_____

_____

____ **Total Current Ability to Prevent/Take Early Action Score**

WASHINGTON STATE
RECREATION AND CONSERVATION OFFICE
Washington Invasive Species Council

Invasive Species Management Priorities

Here

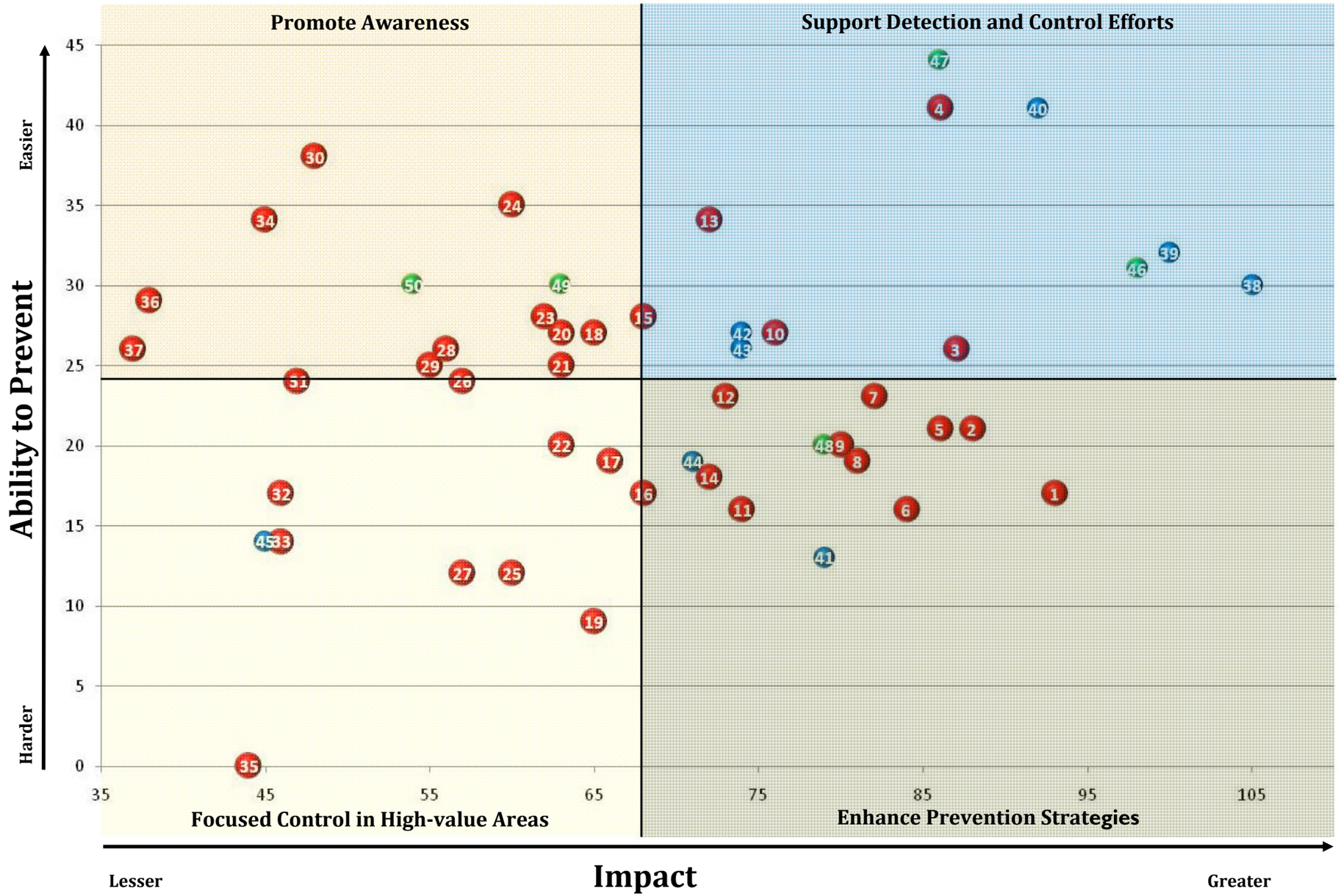
1. Feral swine
2. Variable leaf milfoil
3. Brazilian elodea
4. Hydrilla
5. Knapweeds
6. Nutria
7. Yellow starthistle
8. Common reed – non native genotypes
9. Leafy spurge
10. Eurasian watermilfoil
11. Tunicates
12. Parrotfeather
13. Spartina
14. Tamarix
15. Purple loosestrife
16. Dalmation toadflax
17. New Zealand mud snail
18. Himalayan blackberry
19. Knotweeds
20. Green crab
21. Rush skeletonweed
22. Scotch thistle
23. Red swamp/rusty crayfish
24. Bullfrog
25. Garlic mustard
26. Kochia
27. VHS type IVa
28. Exotic apple fruit pests
29. Mediterranean snail
30. Common crupina
31. Hawkweeds
32. Butterfly bush
33. Scotch broom
34. Tansy ragwort
35. Exotic leafrollers
36. Giant hogweed
37. Atlantic salmon

Near

38. Zebra/quagga mussel
39. Lymantriids
40. Kudzu
41. Caulerpa
42. SVCV/IHNV
43. Mitten crab
44. Marine clams
45. Bark-boring moths

Far

46. Wood-boring beetles
47. VHS type IVb
48. Water chestnut
49. Asian carp
50. Northern snakehead fish



Invasive Species Management Priorities

Invasive species constitute one of the gravest threats to Washington's plants, animals, and businesses dependent on the rich biodiversity here.

Two critical parts to managing invasions are:

1. Identifying the species that threaten resources
2. Prioritizing species for management action

To better manage invasions, the Washington Invasive Species Council developed an assessment process to provide a transparent, repeatable, and credible basis for the council and partner agencies to prioritize management actions for invasive species (see assessment tool for more details).

All taxonomic groups are represented in the council's assessment process, not just plants or marine species as seen in other assessments. **Based on best-professional judgment and science, this is a management tool to categorize invasive species of greatest threat to Washington and to guide council action.**

The Scores

The assessment provides two scores for each species:

- An **impact score** that relates to a species' environmental, economic, and human health threat
- A **prevention score** that relates to an agency's ability to take preventative or early action for that species

For example, the higher the impact score, the greater the threat is to Washington's environment, economy, human health, or a combination of them. The higher the prevention score, the greater the opportunity for an agency to prevent establishment of the species or the greater the agency's ability to respond quickly to new infestations.

Both of these scores are plotted on a management grid to inform the council on future actions to take and to track the effectiveness of those actions. The actual scores are less important than the relative difference among species and the change in score over time.

The scores also will serve as a baseline against which to measure how effective the actions of the council and other agencies are in reducing a species' impact and improving the ability of state agencies to prevent new species from establishing, and to conduct a rapid response. The movement of a species on the graph will be important to enable the council to be adaptive in implementing its actions.

Creating the List

A workgroup of invasive species professionals, each with expertise in a different taxonomic group (e.g., terrestrial plants, insects, aquatic animals), came together and identified species that pose the greatest threat to Washington's environment, economy, and human health. While most of the species on the list already live in Washington, some are in the western United States as well as outside the western United States but in areas with similar climate conditions.

This is a dynamic list, which will be revisited and re-evaluated annually. At that time, new species posing serious risk to Washington will be added to the list and new information will be incorporated into species assessments.

How the List will be Used

The grid will guide council action, such as looking at the current ability to prevent new infestations, making policy recommendations, and identifying where more management or education is needed.

It is intended also to:

- Provide a uniform methodology for categorizing invasive species.
- Provide a clear explanation of the process used to evaluate and categorize species.
- Provide flexibility so the criteria can be adapted to the needs of different regions or organizations.
- Identify where more information may be needed.
- Educate about the impacts of invasive species and the ability to prevent them.

Meanwhile, the graph is not intended to:

- Represent a scientifically-based risk assessment (this is an assessment based on best professional judgment).
- Produce a list that itself has regulatory force, though regulatory agencies may use the information to modify existing lists.
- Provide lists for any region because the invasiveness of species will differ from one region to another depending on geography, climate, ecosystems present, and other factors.

Lower impact Higher prevention ability Management actions: Promote awareness and encourage citizen action.	**Higher impact Higher prevention ability** Management actions: Support detection and control efforts and prepare response plans.
Lower impact Lower prevention ability Management action: Focus control on species in high-value sites.	**Higher impact Lower prevention ability** Management actions: Prepare response plans, identify regulatory gaps, and enhance prevention strategies through policy, education, and funding.

How to Read the Grid

The grid is divided into four sections based on high and low impact scores and high and low prevention scores. Management actions presented in the quadrants then pertain to the group of species falling there.

More information may be found at www.InvasiveSpecies.wa.gov.

2015

Strategic Plan

WASHINGTON INVASIVE SPECIES COUNCIL

WASHINGTON STATE
RECREATION AND CONSERVATION OFFICE
Washington Invasive
Species Council

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If you need this information in an alternative format, please call 360-902-3000 or TDD 360-902-1996

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BACKGROUND

THE INVASIVE SPECIES COUNCIL

In recognition of the tremendous economic and environmental impact caused by invasive species, the Legislature created the Washington Invasive Species Council in 2006. The council is tasked with providing policy level direction, planning, and coordination to the various public and private entities working throughout Washington State in order to prevent and control the spread of harmful invasive species.

The council is comprised of members from state, federal, local, regional, and tribal government agencies; non-governmental organizations; and industry groups. The council meets quarterly and provides a venue for regular communication between our members, partners, and the public. This ongoing coordination results in consistent statewide priorities, efficient management approaches, and common messaging to prevent the introduction and spread of invasive species in Washington State.

MISSION STATEMENT

Sustaining Washington's human, plant, and animal communities and our thriving economy by preventing the introduction and spread of harmful invasive species.

PRIMARY GOALS

1. Provide policy level direction, planning, and coordination in order to empower those engaged in the prevention, detection, and eradication of invasive species.
2. Serve as a forum for invasive species education and communication.
3. Develop a statewide invasive species strategy in order to coordinate and focus local, state, tribal, and regional management efforts.

WASHINGTON STATE
RECREATION AND CONSERVATION OFFICE
Washington Invasive
Species Council

INTRODUCTION

PROTECTING WASHINGTON'S NATURAL RESOURCES

Washington State is known for its diverse landscapes, abundant natural resources, rich recreational opportunities, and strong economy.

From the marine waters of the Puget Sound and temperate rainforests of the Olympic Mountains, to the shrub-steppe and grassland habitats bordering the mighty Columbia River, Washington's diverse ecosystems support an abundance of wildlife. Washington has nearly 340 plants species of conservation concern[1] and more than 100 animal species of conservation concern,[2] as well as many others that are vulnerable with changing climate conditions, fragmented landscapes, and competition from invasive species.

The state's rich soil and plentiful water supply make Washington one of the most productive growing regions in the world, with agricultural production valued at more than $10 billion a year. The rivers and lakes provide electricity for cities, habitat for five species of Pacific salmon, and recreational opportunities for the people who live here and love to play outside. Outdoor recreation in Washington State contributes an estimated $22.5 billion annually to the state economy.[3]

Invasive species threaten our resources, ecosystems, native wildlife, and our very way of life here in Washington State. Invasive insects such as gypsy moth, apple maggot, and wood-boring beetles threaten crop production, apple orchards, and timber harvest. Controlling these invasive insects costs the state millions of dollars annually but saves the state hundreds of millions in economic impacts to agricultural and forestry production.[4] Zebra and quaqqa mussels threaten hydropower generation, irrigation facilities, and this state's water supply, and are expected to cost the Northwest region hundreds of millions of dollars annually to control if they arrive.[5] Invasive fish such as northern pike, bass, and walleye threaten Washington's fisheries, reducing fishing opportunities and the success of the multi-billion dollar investment in salmon restoration.

Invading species arrive here through a variety of pathways – in the ballast water of ships, on vehicles, on recreational equipment, through the nursery and pet trades, and through many other modes of travel. The rate of new introductions is only predicted to increase with climate change and increasing global trade. Though most invasive species introductions are

[1]Washington Department of Natural Resources. 2014. Natural Heritage Program Rare Plant List.
[2]Washington Department of Fish and Wildlife. 2013. Threatened and Endangered Wildlife in Washington: 2012 Annual Report. Listing and Recovery Section, Wildlife Program, Washington Department of Fish and Wildlife, Olympia. 251 pp.
[3]Washington State Recreation and Conservation Office. 2015. An Analysis of Outdoor Recreation in Washington State.
[4]Washington State Department of Agriculture. 2012. Pest Program Frequently Asked Questions on Gypsy Moth.
[5]Northwest Power and Conservation Council Independent Economic Advisory Board. 2013. Economic Risk of Zebra and Quagga Mussels in the Columbia River Basin.

unintentional, they can do irreversible harm; decimating native species and quickly degrading ecosystems and landscapes. Preventing an invasion is far less expensive than trying to control or eradicate a species once it arrives. It requires broad public awareness, targeted outreach, coordinated management, and most importantly leadership.

The Legislature established the Washington Invasive Species Council in recognition of the threats posed by invasive species and in recognition of the enormous challenges associated with invasive species management in Washington State. Management of invasive species in Washington State is inherently complex due to the number of pathways through which species are introduced and dispersed and the number of entities involved in management. Before the council's establishment, detection, response, and prevention capabilities were inhibited by a lack of statewide priorities, streamlined policy, and sustainable funding. Council leadership has provided better coordination and policy support and has assisted in making management as efficient and effective as possible.

Continued council coordination is essential to maintaining statewide priorities, expanding the state's early detection capabilities, standardizing outreach, and encouraging the use of best management practices. It may not be possible to prevent all invasive species from entering Washington, nor to completely eradicate those already here. However, by working together, the council can decrease significantly the economic and environmental impacts posed by invasive species.

STATEWIDE STRATEGY

After 7 years of implementing its original strategy, *Invaders at the Gate*, the council recognized a need to update its statewide strategic plan. This revised plan provides new priorities and policy direction, and formalizes the council's commitment to working towards the common goal of preventing the introduction and spread of invasive species in Washington State. This update is intended to guide the council's work for the next five years.

The council's *2015 Strategic Plan* identifies 14 objectives and 29 specific actions within 5 major areas of work:

I. Leadership and Coordination

II. Education and Outreach

III. Prevention

IV. Early Detection and Rapid Response

V. Containment, Eradication, and Control

The council and its partners and stakeholders are committed to achieving the bold objectives outlined in this plan with the goal of reducing the adverse impacts of invasive species on Washington's human, plant, and animal communities as well as our thriving economy.

INTRODUCTION

COUNCIL WORK PLAN

In addition to this statewide strategic plan, the council has developed a 2-year work plan (Appendix 1) that will focus attention on urgent and priority actions critical to the council's mission and the work of its members, partners, and stakeholders. Progress towards the goals and objectives outlined in this plan will be acknowledged and described in detail in the council's annual reports.

I. LEADERSHIP AND COORDINATION

OBJECTIVE A

Promote adequate and sustainable funding from the Washington State Legislature; Governor's Office; and state, federal, and tribal agencies for invasive species response and prevention.

Problem Statement

The State lacks stable funding for invasive species detection, management, and prevention. Long-term, sustainable funding is essential to adequately monitor, research, prevent, and manage invasive species. With the help of its members and partners, the council has talked with legislators, legislative staff, Congress, and the Governor's Office about invasive species funding. This outreach has resulted in small victories but a long-term, adequate, and sustainable funding structure for invasive species management has yet to be established.

The council will continue to seek adequate and sustainable funding for invasive species management through the following actions:

Strategic Objectives

1. Collaborate with partners to develop and support requests for adequate, stable funding and enhanced statutory authority to sustain effective invasive species programs.
2. Work with partner agencies, legislators, and legislative staff to promote the creation of a state emergency response fund, which can be used to fund response activities for new invasive species detections and rapidly expanding existing invasive species.
3. Continue to work with regional partners to do outreach to Congress on the impacts of invasive species and the need for federal support for state invasive species management and prevention efforts.
4. Collaborate with partners to improve efficiencies in spending and operations across state, federal, local, regional, and tribal government agencies.
5. Work with partner agencies to conduct an analysis of the economic impacts of invasive species in Washington State.

I. LEADERSHIP AND COORDINATION

OBJECTIVE B

Promote enhancements to state and federal invasive species policy.

Problem Statement

Many state and federal invasive species policies are outdated which limits the council's ability to respond quickly on the ground. Streamlined policy, clear management authority, and agreed upon species classification and risk levels make rapid response more efficient. State, federal, and tribal invasive species policies should evolve alongside management needs in order to provide the necessary regulatory guidance for response. The council works with its partners to develop policy that promotes efficiency, clarifies authority, helps prioritize species, enhances coordination, and addresses resource concerns.

The council will continue to support the development and enhancement of invasive species policy through the following actions:

Strategic Objectives

1. Collaborate with partners to gain legislative support for reauthorization of the council before the sunset date in 2017.
2. Develop a plan for increasing the staffing and funding capacity of the council so it can support more projects and better serve invasive species managers statewide.
3. Assist regional entities (invasive species councils, Pacific States Marine Fisheries Commission, 100th Meridian Initiative-Columbia Basin Team, the Western Regional Panel, and the Pacific Northwest Economic Region, etc.) in developing legislation that promotes management capacity, regulatory consistency, and adequate resources for regional prevention efforts.
4. Review and develop recommendations for state, federal, tribal, and local government policies that may influence invasive species populations (classification of game fish, use of non-natives for bioenergy, use of non-natives for mitigation, etc.).
5. Participate in state- and national-level initiatives to assess the effects of climate change on the distribution of invasive species and their impact on ecosystems.

I. LEADERSHIP AND COORDINATION

OBJECTIVE C

Coordinate with partners from state, federal, local, regional, and tribal government entities to ensure that the council's actions are advancing its statewide management objectives.

Problem Statement

There are diverse organizations working to control invasive species throughout Washington State. This makes coordination critical for statewide management to be both efficient and effective. Coordination at the council level has been highly effective at bringing the critical managers and stakeholders to the table to work on strengthening prevention efforts. For example, thanks to council coordination, the Department of Transportation has implemented much stronger prevention protocols, such as using clean fill materials, cleaning equipment, and ensuring that field crews are trained in how to decontaminate gear and prevent the spread of invasive species on project sites.

Council coordination also has helped to organize response activities and develop tools and simple messages for public outreach. The council has been successful at coordinating with partners to advance regional invasive species initiatives such as the "Don't Move Firewood" campaign, the "Clean, Drain, Dry" campaign, and the "Report a Pig" campaign.

The council will continue to coordinate with partners on the following statewide initiatives:

Strategic Objectives

1. Identify additional opportunities to incorporate language on invasive species management and prevention into agency, tribal, local, and industry policy documents.
2. Advance regional communication and outreach initiatives such as the "Don't let it loose" campaign.
3. Facilitate regional science and policy forums on invasive species issues.
4. Continue to seek advice from industry partners by coordinating an industry advisory group.
5. Develop an updated contact list for local, state, federal, and tribal on-the-ground staff responsible for invasive species detection, prevention, and control.

6. Continue to provide current invasive species information and best practices to the public via the council's Web site, Facebook page, and at outreach events.

PAST ACCOMPLISHMENT: REGIONAL OUTREACH CAMPAIGNS

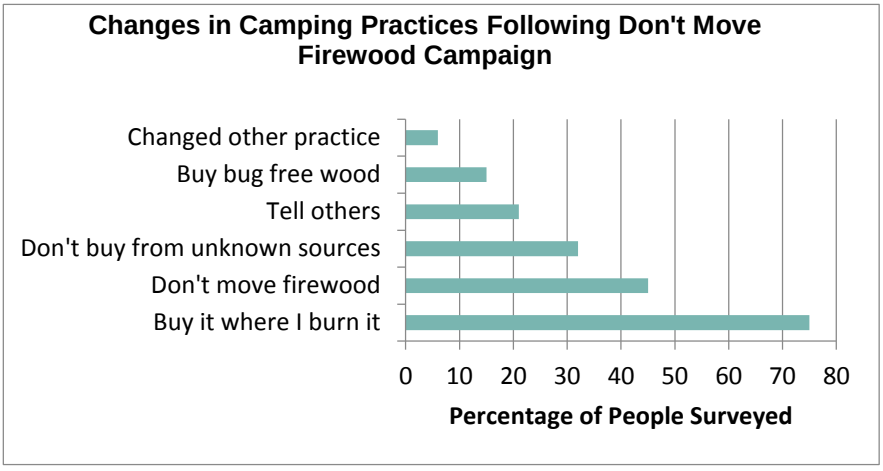
DON'T MOVE FIREWOOD CAMPAIGN

The movement of firewood, and invasive insects that live in it, jeopardizes Washington forests and outdoor recreation sites. In 2011, the council teamed up with the invasive species councils of Oregon and Idaho to create and implement an outreach campaign designed to raise the public's awareness about firewood as a means of invasive species introduction and spread.

The outreach campaign involved several informational elements used simultaneously in Washington, Oregon, and Idaho, including billboards, signs at federal and state campgrounds, back-lit display boards at highway rest stops, educational materials handed out at campgrounds, and messages about this issue on the national and Washington State Parks and Recreation Commission campground reservation Web sites.

Public awareness was measured before and after implementation of the campaign. Results showed an increase from 27 percent to 50 percent of people surveyed who had heard about this issue. Of the people who learned about the risks of spreading invasive species in firewood, more than half of them changed their camping practices to prevent the spread of invasive insects (Figure 1). For example, 75 percent of the people surveyed said that they now buy their wood in the area where they are camping and 32 percent said that they no longer purchase wood without knowing where it has come from.

Figure 1: The changes in camping practices following the don't move firewood outreach campaign, as measured by pre and post campaign surveys.



II. PREVENTION

OBJECTIVE A

Identify and address new and existing pathways to prevent the entry and movement of invasive species.

Problem Statement

New invasive species are arriving in Washington State through multiple pathways, such as through global shipping, the nursery trade, and on private vehicles and boats. The rate of new introductions is predicted to increase as climate change alters habitat conditions and species' native ranges. Preventing an invasion is far less expensive than trying to control or eradicate a species once it arrives. Through the Baseline Assessment project, the council has done extensive work to analyze the most common pathways for species introduction and spread in the Puget Sound basin. The council is working to expand this project in order to further investigate invasive species pathways statewide. Additionally, the council works with industry groups (recreational boaters, nursery trade, etc.), providing them with information on how they can help reduce the spread of invasive species.

The council will take the following actions to prevent the entry and spread of invasive species:

Strategic Objectives

1. Work with the Bonneville Power Administration and other federal agencies to assist the Northwest states in preventing the establishment of aquatic invasive species, particularly quagga and zebra mussels.
2. Encourage environmental risk assessments to be conducted when non-native species are being used as a mitigation alternative for native species.
3. Strengthen communication between agencies, tribes, cities, counties, universities, and other regional organizations to share information on new introductions and new pathways for introduction.
4. Determine pathways of introduction for all priority invasive species and convene an interagency working group to develop prevention protocols.

II. PREVENTION

OBJECTIVE B

Work with state, federal, local, regional tribal agencies, and regional partners to identify opportunities for enhanced, coordinated, standardized, and complementary prevention approaches.

Problem Statement

There is a need for continued coordination between the entities involved in managing and preventing the spread of invasive species in Washington State. Standardized messaging, decontamination protocols, and best management practices help to promote efficient and consistent prevention efforts.

The council plays an important role in helping agencies develop best management practices and decontamination protocols, along with informational materials on prevention for state, federal, and tribal employee trainings. Due to the evolving nature of science, agency policy, and leadership, there is a need for continued support from the council to ensure that consistent protocols and best management practices are being used statewide.

The council will focus its coordinating capacity on the following preventative actions.

Strategic Objectives

1. Convene a meeting with agency, local, and tribal representatives to develop and promote the use of training tools that encourage consistent, statewide best management practices (i.e. decontamination videos, brochures, signs, workshops, etc.). Follow up on the use of these tools.

2. Develop and incorporate language on invasive species prevention and best practices into state, federal, and tribal policy, permitting; contracting, and grant documents. Explore opportunities within state contracts, Hydraulic Project Approvals, restoration programs, Recreation and Conservation Office's grant manuals, mandatory contract training modules, etc.

II. PREVENTION

OBJECTIVE C

Engage stakeholders, partners, and the public in managing invasive species pathways and preventing the introduction and spread of invasive species into terrestrial, riparian, and aquatic ecosystems.

Problem Statement

Coordination among the invasive species managers, partners, and stakeholders is essential to increasing public awareness on invasive species, their impacts, and effective prevention measures. One of the greatest successes of the council in the past 7 years has been its ability to engage and coordinate with new stakeholder groups on prevention campaigns. The council has been successful at helping develop common messages that can be used by all of its partners, allowing it to reach more people and have a greater influence on behavior.

The council will continue to promote invasive species education, outreach, and prevention through the following actions:

Strategic Objectives

1. Update established outreach materials and develop and provide new outreach materials and tools to stakeholder groups (WA Invasives app, information on decontamination protocols, reporting line information, boat ramp stencil, etc.).
2. Convene a workshop with federal, state, tribal, and regional organizations to discuss data consistency and tools and to encourage regional data sharing.

PAST ACCOMPLISHMENT: PREVENTING THE SPREAD OF INVASIVE SPECIES ON STATE PROJECTS

Preventing the spread of invasive species is the least costly and most environmentally safe approach to managing invasive species. It eliminates the need for costly emergency action, application of chemicals, and harmful impacts on native species and ecosystems.

Knowing that contaminated equipment is a common pathway for spreading invasive species, the council has worked with its member agencies to get language into various policy and contracting documents that encourages decontamination of gear and reduces the spread of invasive species on state-funded project sites.

The council was successful in getting language into the State Environmental Policy Act, the Department of Natural Resource's State Trails Policy, the Bonneville Power Administration's grant contracts, as well as in all of the Recreation and Conservation Office's grant manuals. The council also is developing decontamination protocols to be included in the Department of Fish and Wildlife's Hydraulic Project Approvals along with the Department of Transportation's Standard Specifications. This is an important step in ensuring that council members and partners are not a part of the problem but a part of the solution.

III. EDUCATION AND OUTREACH

OBJECTIVE A

Increase and enhance communication across partner entities to support coordinated outreach to the public, private sector, and policymakers.

Problem Statement

Prevention and early detection of invasive species introductions requires the help of the public, industry partners, and policymakers. The council has helped develop tools and regional messaging that has been successful in raising public awareness about invasive species, their impacts on native ecosystems, and the steps people can take to prevent the spread of invasive species. In collaboration with regional partners, the council developed common prevention-focused messages and outreach materials (brochures, signs, etc.). The council's smart phone app WA Invasives provides education to citizen scientists and helps in the early detection of new invasive species. The council also works to raise invasive species awareness by supporting regional conference and workshops; presenting to students, agencies, and industry groups; and participating in National Invasive Species Awareness Week.

The council will continue to support targeted education and outreach through the following actions:

Strategic Objectives

1. Develop a communication and outreach plan that outlines strategies for outreach; promotion of the WA Invasives app, and opportunities to revise council messages on the council Web site, in printed publications, and on signs.

2. Establish priorities and common messages for council member agencies and others to use when conducting outreach at boat shows and other events.

PAST ACCOMPLISHMENT: PUBLIC OUTREACH

In 2015, the council purchased two large stencils that read

"Stop Invasive Species Clean, Drain, and Dry your Boat."

The council worked with the Departments of Ecology, Fish and Wildlife, and Transportation to paint the message on the Lake Washington boat ramp in Kenmore.

The goal of this messaging is to remind boaters and other lake-users of the simple steps they can take to prevent the spread of aquatic invasive species.

Over the course of the 2015 summer the stencil was used by various local government entities and state agencies and the "clean, drain, dry" message was painted on boat launches statewide.

III. EDUCATION AND OUTREACH

OBJECTIVE B

Support the development of education and outreach materials that encourage the use of native and non-invasive species in restoration, gardening, landscaping, and science kits.

Problem Statement

Invasive species often are spread across the landscape due to misidentification and misinformation. Focused outreach to nurseries, soil and gravel distributers, the pet trade, landscapers, and restoration ecologists has proven successful at raising awareness and reducing the harmful impacts caused by invasive species. The council works with its member agencies and industry partners to provide training, education, and outreach to agency staff, science teachers, nurseries, master gardeners, and many other audiences. The council also developed creative alternatives such as pollinator-friendly, non-invasive seed packets – a collaborative project sponsored by the council, the Department of Agriculture, and the State Noxious Weed Control Board.

The council will continue to develop education and outreach materials that promote the use of native species through the following actions:

Strategic Objectives

1. Support the development of curriculum on invasive species to include in kindergarten through high school science classes and science competitions such as the Science Olympiad.

2. Work with the State Noxious Weed Control Board to develop best management practices for wildfire rehabilitation to help prevent colonization by non-natives.

IV. EARLY DETECTION AND RAPID RESPONSE

OBJECTIVE A

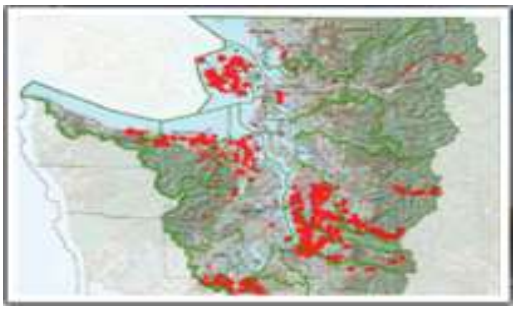
Continue to compile information and conduct a baseline assessment of invasive species information and programs in Washington. This baseline would serve as an initial step towards coordinating a statewide, strategic response to the threat of invasive species.

Problem Statement

Invasive species management in Washington State is complex due to the number and types of pathways through which species are introduced and dispersed and also by the number of entities involved in management. There is a diverse array of organizations working to prevent the introduction and spread of invasive species, physically control or eradicate them, monitor their distribution, and understand their characteristics.

The 2008 State Strategic Plan, *Invaders at the Gate*, identified a need to centralize invasive species data to inform managers on the status and potential impact of these species and promote coordination across programs. Since 2008, the council has done significant work to centralize data and promote coordination between programs in the Puget Sound basin through its Baseline Assessment project. The council needs to expand this work into the rest of Washington State.

The council will continue to compile information on invasive species distribution through the following actions:



PAST ACCOMPLISHMENT: BASELINE ASSESSMENT PROJECT

Since 2008, the council has been seeking answers to the following questions:

- What invasive species are in Washington?
- Where are they?
- What impacts are they having?
- How are they moving around?
- Who is managing them and how effective is management?

Thanks to a National Estuary Program grant, the council was able to investigate these questions in the Puget Sound basin through its baseline assessment project. The project provided the council with a better understanding of what invasive species are present in the Puget Sound basin, how far they have spread, how well they have established, and whether management action is being taken.

The data gathered through this project has proved incredibly valuable to managers. In 2015, the council began searching for grant funding to help expand this work to the rest of the state. Building on the baseline data will help make management as effective and efficient as possible.

Strategic Objectives

1. Pursue grants to expand the Baseline Assessment work statewide.

2. Incorporate WA Invasives smart phone app data into EDDMAPS invasive species mapping program.

IV. EARLY DETECTION AND RAPID RESPONSE

OBJECTIVE B

Improve detection of invasive species by training field biologists, foresters, highway maintenance crews, citizen-scientists, and other land and water stewards to identify and report priority invasive species and support the use of information technology.

Problem Statement

There are limited resources dedicated to invasive species detection in Washington State. That said, the state has a largely untapped resource with thousands of trained ecologists, botanists, biologists, foresters, entomologists, citizen scientists, and other field crews. If provided with training and tools, they could assist in the identification and early detection of invasive species, which would help the council's understanding of the magnitude of the problem and the management needs. The WA Invasives app is an example of one tool developed by the council that can be used by both trained and untrained people to monitor and detect invasive species.

The council will continue to develop and promote innovative tools to engage the public in invasive species management with the following action:

Strategic Objective

1. Conduct trainings on the WA Invasives app and provide information on decontamination protocols and best practices.

PAST ACCOMPLISHMENT: WA INVASIVES

In 2014, the council released the WA Invasives app for iPhone and Android. The app allows citizen scientist to help managers detect and report invasives species. The app includes education and identification information on the top 50 invasive species in Washington to encourage reporting of priority species.

The council also created a Web application for state managers so they can access data input using the WA Invasives app and filter by various features (location, date, species, etc.).

IV. EARLY DETECTION AND RAPID RESPONSE

OBJECTIVE C

Support rapid response planning for high risk species by providing technical support to managers and by facilitating coordination across state and federal regulatory processes.

Problem Statement

Quick and organized response is key to controlling a new invasive species infestation. Precious time can be lost while determining authority and identifying funding and permitting requirements. The council has played an important role in assisting with agency coordination and development of response plans for priority species such as feral swine and dreissenid mussels.

The council will continue to provide coordination and technical support for response planning efforts through the following actions:

Strategic Objectives

1. Support the development of rapid response plans and regional rapid response efforts by identifying gaps in management authority and providing technical support.

2. Align state, federal, and tribal regulatory processes to facilitate rapid response efforts by creating a subcommittee to address regulatory coordination and compliance with environmental regulatory processes, (National Environmental Protection Act, State Environmental Protection Act, Endangered Species Act, and the National Pollutant Discharge Elimination System).

V. CONTAINMENT, CONTROL, AND ERADICATION

OBJECTIVE A

Support the containment of invasive species that are established in Washington State to prevent greater spread and support the control and eradication of smaller or newly-discovered infestations.

Problem Statement

In the case of particularly harmful invasive species such as gypsy moth and dreissenid mussels, it is important to move rapidly to contain an infestation and prevent further spread throughout the state. The council coordinates with state, federal, and tribal agencies to determine priority, high-risk species that require rapid response and containment measures. Changing climate conditions and increased global movement of people and goods is expected to amplify new invasive species introductions.

The council will continue to support invasive species managers in containment, control, and eradication efforts through the following actions:

Strategic Objectives

1. Select priority species and assist agencies and other groups to search for funding for eradication.
2. Support research to make new control tools available and improve the efficacy and specificity of existing tools.
3. Conduct targeted outreach to nurseries and pet stores on invasive species and prohibited species to reduce their sale in Washington State.

ATTACHMENT 1: WORK PLAN

This work plan outlines the approach the council will follow to address the strategic objectives. The strategic objectives are prioritized into tiers: Tier 1 is the priority near-term objectives, which will be addressed within the next 2 years. Tier 2 and Tier 3 objectives are long-term objectives, which will be reviewed annually and implemented based on need and availability of resources.

TIER 1

Leadership and Coordination

- I A 1: Collaborate with partners to develop and support requests for adequate, stable funding and enhanced statutory authority to sustain effective invasive species programs.
- I A 2: Work with partner agencies, legislators, and legislative staff to promote the creation of a dedicated state emergency response fund.
- I A 5: Work with partner agencies to find funding to conduct an analysis of the economic impacts of invasive species in Washington State.
- I B 1: Collaborate with partners to gain legislative support for reauthorization of the council before the sunset date in 2017.
- I C 1: Advance regional communication and outreach initiatives such as the "Don't let it Loose" campaign.
- I C 3: Facilitate regional science and policy forums on invasive species issues.
- I C 4: Continue to seek advice from industry partners by coordinating an industry advisory group.

Prevention

- II A 3: Strengthen communication between agencies, tribes, cities, counties, universities, and other regional organizations to share information on new introductions and new pathways for introduction.
- II A 4: Determine pathways for introduction for all priority invasive species and convene an interagency working group to develop prevention protocols.
- II B 1: Develop and incorporate language on invasive species prevention and best practices into state, federal, and tribal policy, permitting, contracting, and grant documents. Explore opportunities within state contracts, Hydraulic Project Approvals, restoration programs, Recreation and Conservation grant manuals, and mandatory contract training modules.
- II C 1: Update established outreach materials and develop and provide new outreach materials and tools to stakeholder groups (WA Invasives app, information on decontamination protocols, reporting line information, boat ramp stencil, etc.)

Education and Outreach

- III B 1: Support the development of curriculum on invasive species to include in kindergarten through high school science classes and science competitions such as the Science Olympiad.

Early Detection and Rapid Response

- IV C 1: Support the development of rapid response plans and regional rapid-response efforts by providing gap analysis and technical support.
- IV C 2: Align state and federal regulatory processes to facilitate rapid response to newly discovered invasive species.

TIER 2

Leadership and Coordination

- I A 4: Collaborate with partners to improve efficiencies in spending and operations across state, federal, local, regional, and tribal government agencies.
- I B 2: Develop a plan for increasing the staffing and funding capacity of the council so it can support more projects and better serve invasive species managers statewide.
- I B 3: Assist regional entities (Invasive Species Councils, Pacific States Marine Fisheries Commission, 100th Meridian Initiative-Columbia Basin Team, the Western Regional Panel, and the Pacific Northwest Economic Region, etc.) in developing legislation that promotes management capacity, regulatory consistency, and adequate resources for regional prevention efforts.
- I B 4: Review and develop recommendations for state, federal, tribal, and local government policies that may influence invasive species populations (ex: classification of game fish, use of non-natives for bioenergy, use of non-natives for mitigation, etc.).
- I B 5: Participate in state and national-level initiatives to assess the effects of climate change on the distribution of invasive species and their impact on ecosystems.
- I C 1: Identify additional opportunities to incorporate language on invasive species management and prevention into agency, tribal, local, and industry policy documents.
- I C 6: Continue to provide current invasive species information and best practices to the public via the council's Web site, Facebook page, and at outreach events.

Prevention

- II A 2: Encourage environmental risk assessments to be conducted in cases where non-native species are being used as a mitigation alternative for native species.

- II B 1: Convene a meeting with agency, local, and tribal representatives to develop and promote the use of training tools that encourage consistent statewide best management practices (i.e. decontamination videos, brochures, signs, workshops, etc.). Follow up on the use of these tools.
- II C 2: Convene a workshop with federal, state, tribal, and regional organizations to discuss data consistency and tools and to encourage regional data sharing.

Education and Outreach

- III A 1: Develop a communication and outreach plan that outlines strategies for outreach; promotion of the WA Invasives app, and opportunities to revise the council Web site, factsheet, messaging, signs, etc.
- III A 2: Establish priorities and common messaging for council member agencies and others to use when conducting outreach at boat shows and other events.

Early Detection and Rapid Response

- IV A 1: Pursue grant funding to expand the baseline assessment work.
- IV B 1: Conduct trainings on the WA Invasives app and provide information on decontamination protocols and best practices.

Containment, Control, and Eradication

- V A 1: Select priority species and assist agencies and other groups to search for funding for eradication.

TIER 3

Leadership and Coordination

- I A 3: Continue to work with regional partners to do outreach to Congress on the impacts of invasive species and the need for federal support for state invasive species management and prevention efforts.
- I C 5: Develop an updated contact list for local, state, federal, and tribal on-the-ground staff responsible for invasive species detection, prevention, and control.

ATTACHMENT 1: WORK PLAN

Prevention

- II A 1: Work with the Bonneville Power Administration and other federal agencies to assist the Northwest states in preventing the establishment of aquatic invasive species such as zebra and quagga mussels.

Education and Outreach

- III B 2: Work with the state noxious weed control board to develop best management practices for wildfire rehabilitation to help prevent colonization by non-natives.

Early Detection and Rapid Response

- IV A 2: Incorporate the WA Invasives smart phone app data into EDDMAPS invasive species mapping program.

Containment, Control, and Eradication

- V A 2: Support research to make new control tools available and improve the efficacy and specificity of existing tools.
- V A 3: Conduct targeted outreach to nurseries and pet stores on invasive species and prohibited species in order to reduce their sale in Washington State.

WASHINGTON STATE UNIVERSITY EXTENSION

COLLEGE OF AGRICULTURAL, HUMAN, AND NATURAL RESOURCE SCIENCES

May 31, 2016

Mr. Justin Bush
Executive Coordinator
Washington Invasive Species Council
Natural Resources Building
PO box 40917
Olympia, WA 98504-0917

Dear Mr. Bush:

Thank you for your request to appoint a representative from Washington State University Extension to serve on the Washington Invasive Species Council. By this letter, I am appointing Todd Murray, Director of the Agriculture and Natural Resources Program Unit within WSU Extension to serve as the representative from WSU Extension. Todd is based in Pullman. I'm also appointing Rachel Bomberger as the alternate representative. Rachel services as the plant diagnostician for WSU's Plant Pest Diagnostic Clinic in Pullman.

I have attached a short biography for both.

Thank you for inviting us to be part of this important organization and we look forward to working with you.

Sincerely,

Richard T. Koenig
Associate Dean and Director
WSU Extension

Attachments: Biographies

cc: T. Murray
R. Bomberger

PO Box 646248, Pullman, WA 99164-6248
509-335-2933 | Fax: 509-335-2926 | extension@wsu.edu | ext.wsu.edu

King County
Department of
Natural Resources and Parks
Director's Office
King Street Center
201 S Jackson St, Suite 700
Seattle, WA 98104-3855

June 1, 2016

Bill Tweit, Chair
Washington Invasive Species Council
State of Washington Recreation and
Conservation Office
Natural Resources Building
1111 Washington Street, S.E.
Olympia, WA 98504-0917

Dear Mr. Tweit:

Thank you for your letter of May 20, 2016, about the recruitment of a King County representative and one alternative to serve on the Washington Invasive Species Council. We appreciate the opportunity to participate.

I would like to offer the participation of Steve Burke, Program Manager of the Noxious Weed Control Program in the Water and Land Resources Division in the King County Department of Natural Resources and Parks. As the alternate, we would like to offer Sasha Shaw, Education Specialist in the Noxious Weed Control Program. Both Steve and Sasha are very knowledgeable in invasive species management.

Please feel free to contact Steve and Sasha directly. Steve can be reached at 206-477-4639 or by email at steven-j.Burke@kingcounty.gov. Sasha can be reached at 206-477-4824 or by email at sasha.shaw@kingcounty.gov. They are both aware of the invitation and are looking forward to hearing from you.

Sincerely,

Christie True
Director

cc: Mark Isaacson, Division Director, Water and Land Resources (WLR) Division, Department of Natural Resources and Parks (DNRP)
Joan Lee, Manager, Rural and Regional Services Section (RRSS), WLR Division, DNRP

WASHINGTON INVASIVE SPECIES COUNCIL MEETING SUMMARY
March 3, 2016

Natural Resources Building, Room 172
1111 Washington St SE, Olympia, Washington, 98501

Washington Invasive Species Council Members Present:

Bill Tweit, Chair	Washington State Department of Fish and Wildlife
Ray Willard, Vice Chair	Washington Department of Transportation
Pat Stevenson	Stillaguamish Tribe
Mark Taylor	Trout Unlimited
Shaun Seaman	Chelan Public Utility District, WISC Industry Advisory Panel Representative
Lizbeth Seebacher	Department of Ecology
Anna Lyon	Okanogan County
Dr. Brad White	Washington Department of Agriculture
Vicki Yund	U.S. Customs and Border Protection
Alison Halpern	Noxious Weed Control Board
John Gamon	Department of Natural Resources
Shawna Bautista	U.S. Forest Service
Clinton Campbell	U.S. Department of Agriculture
Rob Fimbel	Washington State Parks and Recreation

Guests and Presenters:

Micki McNaughton	Department of Natural Resources, Urban Forestry Restoration Program
Joe Maroney	Kalispel Tribe
Jen Parsons	Department of Ecology
Laurence Schafer	

Recreation and Conservation Office Staff:

Raquel Crosier	Coordinator
Wendy Loosle	Board Liaison

Welcome and Call to Order

Bill Tweit, Chair, opened the meeting at 9:01 a.m. with welcome, announcements, facility logistics and safety information. Chair Tweit announced several staff changes: Lisa Younger resigned from the council and Raquel Crosier resigned as Executive Coordinator to join the Washington Department of Fish and Wildlife. RCO is conducting interviews to hire a new coordinator.

Hot Topic Reports

Item 1: Executive Coordinator's Report / Raquel Crosier

Raquel Crosier provided an overview of council activities since the December meeting. Outreach activities included legislative briefings, Port Blakely Tree Farm, Seattle Boat Show, and an Asian Gypsy Moth Town Hall meeting. Upcoming activities include the Portland Sports Show, a presentation to Mr. Taylor's Chapter of Trout Unlimited, a half-day meeting in Chelan of the AFS – WA/BC Chapter, and the Science Olympiad. Grant updates include the award of the Farm Bill grant and the submission of the No Child Left Inside grant.

The executive committee continues to seek additional venues to hold meetings, as well as expanding the membership of the council to include representatives from one westside county (King County), one eastside tribe (Kalispel), academia (WSU), and a new industry representative from an investor-owned utility (Avista).

Item 2: Legislative Updates / Round Table

Ms. Crosier shared that the reauthorization bill passed, extending the sunset date of the Invasive Species Council. The abundant support for the council supported the legislature's decision to pass the bill.

Alison Halpern provided an update on the legislative activities of the Noxious Weed Control Board. A pilot project was approved for providing guidelines to landowners regarding noxious weeds and native species, contingent upon participation from both sides of the state.

Ms. Crosier shared information about a budget proviso sponsored by Senator Honeyford to support decontamination stations. The funding sources are contingent upon the regular boating facilities program grant cycle, in order to continue positive collaboration with the boating community; Chair Tweit will keep the council apprised of the progress of this proviso.

Item 3: Workshop at the Wildlife Society Annual Meeting / Bill Vogel

Ms. Crosier shared that Mr. Vogel was unable to attend. Denise Hawkins and Carrie, USFWS, provided an update regarding participation in the Science Olympiad, scheduled for March 12 at Highline Community College.

The Wildlife Annual Society Annual Meeting may provide an opportunity for the council to participate, perhaps via a presentation or booth. Ms. Crosier will relay interest from the council to Mr. Vogel based on feedback from the members.

Item 4: Decontamination Protocol Workshop / Raquel Crosier, Ray Willard

Ms. Crosier and Mr. Willard continue to work on incorporating language in the permits for Hydraulic Project Approvals (HPAs) at WDFW and protocols in place at WSDOT regarding invasive species. Allen Pleus, WDFW, shared information about the meetings to implement new performance-based specifications in a phased approach. The group continues to address concerns, questions, and challenges as they arise.

Ms. Halpern offered assistance for any terrestrial-related efforts that the workshop encounters. Ms. Bautista suggested developing criteria or protocols for oil and petroleum-based contaminants resulting from power-washing during decontamination.

Mr. Seaman asked about industry panel support on the workshop; Mr. Pleus responded that local representation suffices for the initial stages, but additional support will likely be requested in later implementation phases. The workshop will continue on the second phase of implementation and provide

an update at the next meeting. Additional interested parties are welcome to contact Mr. Willard with feedback.

Item 5: Economic Analysis of the Impact of Invasive Species in Washington / Alison Halpern

Ms. Halpern provided an update on the economic analysis RFP, sent out in November. The goal of the analysis is to provide a meta-analysis of existing economic information and apply it to Washington State, with the final product being a resource that can be shared publicly and used as an education and outreach tool. The focus will be on 10 noxious weed species and 6 invasive animal/insect species. A vendor was selected and the contract should be executed within the next few weeks, in time to produce a report that can be shared in early summer.

The council discussed potential overlap and contrasts between other states' reports within the region. The report will take care to account for state-specific modeling, and base estimates and explanations on the unique features that may impact numbers for Washington State. Resources that may support the contractor's work on the report can be sent to Ms. Crosier and Ms. Halpern.

Discussions and Decisions

Item 6: Overview of DNR's Urban Forestry Restoration Program / Micki McNaughton

Ms. McNaughton shared information about the Urban Forestry Restoration Program, a partnership between Departments of Natural Resources and Ecology. She described the program's structure, purpose, goals, and work in progress. Healthy trees provide benefits necessary to urban areas (stormwater attenuation, pollution filtration, etc.) and the potential negative impacts of invasive species are of great concern. The program supports crews that remove invasive species from urban areas, focused on high-impact projects, and volunteer crews who restore the cleared area with native plants.

Item 7: Northern Pike Management / Joe Maroney

Mr. Maroney provided an update on management of northern pike in the Pend Oreille River (northeastern Washington) and the implications of the species on downstream environments. Mr. Maroney provided background on the establishment of pike in the Pend Oreille area and associated threats; northern pike is classified as a non-native, prohibitive species in Washington. The Kalispel Tribe and WDFW established goals and management strategies for addressing the species' establishment, including ongoing mechanical suppression. Their efforts also include public education and outreach efforts, particularly noting that pike are toxic and unsafe for human consumption. The Kalispel Tribe continues to seek support from regional partners to control and minimize pike populations.

Chair Tweit suggested that northern pike be included as part of the Don't Let it Loose regional campaign. The council discussed potential catch-and-kill protocols that may be shared or implemented as management efforts continue.

Break: 10:50 a.m. – 11:05 a.m.

Item 8: Flowering Rush / Jenifer Parsons

Ms. Parsons described the Department of Ecology's plant monitoring efforts, specifically addressing flowering rush. She provided background on the species, including germination and dissemination of the seeds and rhizomes; the distribution of the species across the Pacific Northwest region and within Washington State; and negative impacts of flowering rush on native plants, wetlands, fisheries abundance, and recreational opportunities. Research demonstrates a link between flowering rush habitat and that of northern pike spawning habitat, supporting one another to exponentially impact environments in harmful ways. Controlling flowering rush is challenging due to its regenerative ability and permitting requirements; management often relies on manual efforts that must be repeated for several growing seasons, e.g.,

hand-pulling, herbicides, etc. Current research is assessing the potential of biocontrol, particularly insects; results are promising, but not yet conclusive. Continued efforts include sourcing additional funding, adding language regarding flowering species to rules for other invasives' management programs, and regional coordination.

The council discussed potential rapid response options, Chair Tweit suggested adding language to inspection programs, as the vectors seem to be limited to natural water flow and water fowl, and nurseries that originally sold the species have now desisted. Allen Pleus suggested transitioning the Spartina and knotweed programs, which are currently winding down, to focus on flowering rush.

Chair Tweit proposed forming an interagency workgroup to discuss options for distributing management efforts based on expertise, resources, location, and funding. The Departments of Ecology, Agriculture, and Natural Resources agreed to form a working group that will develop a concept for transitioning to an emergent vegetation program or simply adding flowering rush as a focal species, ideally using a holistic approach over a species-specific method.

Item 9: Regional Don't Let It Loose Campaign / Raquel Crosier

Ms. Crosier provided an update on the progress of the Don't Let It Loose campaign subcommittee, comprised of Lizbeth Seebacher, Allen Pleus, and John Gamon. The subcommittee discussed coordinating with other states, developing a logo, and a phased implementation approach. The subcommittee proposal has two phases. Outreach to pet stores and schools will be the focus of phase 1; phase 2 involves addressing illegal pets that can be turned over without penalty to encourage proper disposal.

Item 10: Review Feral Swine Response Plan / Raquel Crosier, Laurence Schafer

Ms. Crosier and Mr. Schafer provided information on current feral swine reports and management efforts in Washington State. Next, they presented the proposed Washington State Interagency Feral Swine Response Plan, drafted in November 2015. An addition to the plan includes a consent form that would permit response teams to enter lands under various ownership to address swine reports.

Mr. Schafer explained that having upfront permission and coordinated efforts with respective land management agencies or private owners is critical to rapid response efforts. He stated that State Parks, DNR, Bureau of Reclamation, USFS, and some others are the most important partners necessary in this work. The council will send support letters with council members, who were asked to take the information and channel back to their respective agencies to put the permissions in place as needed.

Ms. Crosier recommended that the council formally adopt the plan. The council discussed potential additions and edits to the plan. The board adopted the plan by consensus.

Item 11: Review Prioritization Process / Raquel Crosier

Ms. Crosier updated the council on the efforts to update the top 50 invasive species list by the prioritization workgroup. She summarized the proposed timeline for this process, including focused work groups and potential approval and adoption dates. The goal would be to adopt the new list at the December 15, 2016 meeting. Additionally, it was suggested that the list should be updated at regular intervals, e.g., every five years, similar to the strategic plan.

The council discussed the history, process, and purpose for identifying 50 species for the priority list, as well as additional potential prioritized actions associated with each species. Ms. Crosier suggested that council members form team leads to take on focused workgroups (insect, plant, animal, etc.). Chair Tweit asked that members come to the June meeting with suggestions and there will be time dedicated on the meeting agenda to clarify roles and next steps.

Item 12: AIS Funding Advisory Committee / Bill Tweit, Raquel Crosier

Chair Tweit, Ms. Crosier, and Elizabeth McManus provided an update on the progress of the AIS Funding Advisory committee since September. The committee produced a final report and recommendations, published in February 2016. It is intended the report will be submitted to the Legislature in June, and will be used to develop legislation for next session. The committee members have agreed to stay engaged as a coalition, provide funding advocacy, and support the work in coming years. The council expressed consensus in support of the report and recommendations. The committee will finalize signatures and a cover sheet from the council.

Mr. Willard moved to approve the report and recommendations and prepare for submission to the Legislature in June; Mr. Taylor seconded. The motion carried unanimously.

Item 13: Council Business / Raquel Crosier

The council discussed potential new council seats. Mr. Willard moved to send invitations to expand the membership of the council to include representatives from one westside county (King County), one eastside tribe (Kalispel), academia (WSU); Ms. Yund seconded. The motion carried unanimously.

The potential for a new industry representative from an investor-owned utility, Avista, will be pursued by Mr. Seaman. The council will address new representatives to the industry panel as needed.

The council discussed additional venues to hold meetings, in part due to the expanding membership and the need for more technologically resourced meeting spaces. Meeting dates include June 16 (LOTT Center), September 22 (Vancouver), and December 15 (Olympia DES or WSDOT conference room).

No additions or corrections were requested for the previous meetings minutes from the December 2015 meeting. Mr. Taylor made a motion to approve the minutes; Mr. Stevenson seconded. Motion carried.

Public Comment

No public comment was provided at this time.

Adjourn

The meeting adjourned at 12:50 p.m.

Next meeting

June 16, 2016
LOTT WET Center
Olympia, WA

Minutes approved by:

_____ _____

Bill Tweit, Chair Date