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Curriculum Plan for a Killer Whale Deterrence Program

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For more information contact:

Spill Prevention, Preparedness, and Response Program
P.O. Box 47600
Olympia, WA 98504-7600
Phone: 360-407-7455

Washington State Department of Ecology – www.ecology.wa.gov

- Headquarters, Olympia 360-407-6000
- Northwest Regional Office, Bellevue 425-649-7000
- Southwest Regional Office, Olympia 360-407-6300
- Central Regional Office, Union Gap 509-575-2490
- Eastern Regional Office, Spokane 509-329-3400

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Washington State Department of Ecology

Olympia, Washington

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Table of Contents

	<u>Page</u>
Acknowledgements.....	vi
Introduction.....	1
Governor Jay Inslee’s Executive Order	1
Southern Resident Killer Whales.....	2
SRKWs and the risk of oil spills.....	2
Goal for this curriculum.....	2
Underlying assumptions for the curriculum	3
Components of an Effective Deterrence Program	4
Authority, permits, and the Northwest Area Contingency Plan	5
Deterrence methods, tools, and appropriately sized vessels	6
Use of the “OilSpills101” website for registering vessels of opportunity	7
Outreach and communication plan	7
Training plan and materials	8

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Introduction

Governor Jay Inslee's Executive Order

On March 14, 2018, Governor Jay Inslee signed [Executive Order 18-02](#)¹ directing state agencies to take several immediate actions to benefit Southern Resident Killer Whales (SRKWs), and established a [task force](#)² to develop a longer-term action plan for recovery and future sustainability of killer whales. The Department of Ecology Spills Program's immediate actions are to create a curriculum to improve and increase the number of trainings for people with vessels in the whale watching industry to volunteer and assist in the event of an oil spill.

The term *vessel of opportunity* describes an organized system to preregister volunteer boat operators who can be quickly activated after a spill occurs and tasked with specialized response actions that supplement the fleets of professional spill responders. Before a spill, the participants will have varying levels of involvement as a volunteer, but once a spill occurs and the VOOs are activated, the boat operators will be paid. Creating a curriculum to improve and increase the preregistration and the number of trainings is a fundamental step to ensure the long term recovery of SRKWs.

¹ Executive Order 18-02 can be found at www.governor.wa.gov/sites/default/files/exe_order/eo_18-02_1.pdf and the actions of the task force can be found at <https://www.governor.wa.gov/issues/issues/energy-environment/southern-resident-killer-whale-recovery-and-task-force>

² www.governor.wa.gov/issues/issues/energy-environment/southern-resident-killer-whale-recovery-and-task-force

Southern Resident Killer Whales

Killer whales (also referred to as orcas due to their scientific name *Orcinus orca*) are an indicator of the health of Washington's waters. They are among the most endangered marine mammals in the world. Oil spills were identified as a threat to SRKWs when they were listed as an endangered species under the Endangered Species Act (ESA) in 2005. Minimizing the risk of spills and the whales' exposure to oil spills is part of [the Southern Killer Whale Recovery Plan](#).³

The SRKWs are one of three types of killer whales found in the Salish Sea/Puget Sound area. The SRKWs are resident whales due to their pattern of being resident to the area to feed on migrating salmon. Residents feed exclusively on fish. Transient killer whales are also common in the area and feed on marine mammals, including harbor seals and harbor porpoise, which are abundant in this area. Offshore killer whales are occasionally found in the area. They appear to be generalists in their feeding and are often found in large groups. Each of the types of killer whale are unique and genetically and socially isolated from one another. The different types can be identified by trained specialists, but generally are indistinguishable based upon their appearance, so protections for SRKW are applied to all killer whales in the area.

SRKWs and the risk of oil spills

Every year, 20 billion gallons of oil is transported through and near Puget Sound and Salish Sea waterways, posing a risk of a major oil spill, which is mitigated by our best efforts at spill prevention. Inbound oil tankers move crude oil to five major refineries in the Puget Sound, and then move refined oil products out to other destinations. Crude and refined oil is increasingly moved by railroads along transportation corridors that follow our waterways. In addition, petroleum pipelines deliver both crude and refined oil along transportation corridors that sometimes cross our waterways, also posing the risk of a potential oil spill. Oil spills are toxic and can cause both acute and chronic exposure to whales. Oil spills are also potentially destructive to prey populations and may adversely impact whales by reducing food availability. The transport of large volumes of various kinds of oil, and the risk of major oil spills, poses a threat to the recovery of SRKWs.

Presently, the most viable option to avoid impacts to SRKWs during a major oil spill is to monitor for their presence in the larger vicinity of the oil's trajectory, and be prepared beforehand with trained and equipped vessel operators to deter or herd them from entering oil-contaminated waters.

Goal for this curriculum

Whale watching is an important tourism industry in both Washington and British Columbia. The experience that whale watching boat operators gain in safely maneuvering boats in the vicinity of

³ Information on the NOAA Fisheries Killer Whale Recovery Plan Implementation - Oil Spills can be found at www.westcoast.fisheries.noaa.gov/protected_species/marine_mammals/killer_whale/rpi_oil_spills.html.

whales, and a natural heightened desire to protect these marine mammals, make commercial whale watching vessels good candidates for VOOs during oil spills. The goal for this curriculum is to broadly recruit, pre-register, equip, and train whale watching VOOs to be able to safely conduct SRKW deterrence activities during a major oil spill.

The steps forward will include:

- Conduct recruitment and outreach using established organizations, venues, and communities.
- Ask vessel operators to pre-register at the state’s established website, www.oilspills101.wa.gov.
- Seek agreement from the vessel operators for at least one site visit for each vessel to ensure that it can be properly equipped with the necessary equipment.
- Develop and implement a competency-based training program that can be delivered both annually and “just in time,”⁴ ahead of being activated as part of a response, providing maximum flexibility.
- Seek permanent funding opportunities to both implement and grow this VOO program.

Underlying assumptions for the curriculum

In developing this curriculum, certain assumptions have been made. Deterrence of marine mammals is currently authorized through regional plans, legal authorities, and permits. In other words, deterrence activities relative to harm or harassing of a listed species will be covered under existing approval from regulating agencies.

Assumptions for the curriculum:

- Vessel operators and their crews will not be working in contact with oil. Their actions will be limited to surveillance, reporting, and deterrence outside of oiled waters. They will not be using chemical protective clothing or respiratory protection aside from personal protection equipment (PPE) such as floatation devices, boots, goggles, and gloves. The deterrence activities will be covered under an incident-specific health and safety plan developed by the Unified Command during an incident.
- Deterrence activities will occur within the waters of the Salish Sea, the Strait of Juan de Fuca, and Puget Sound. The capability of participating vessels will be matched up to the operating environments to which they are assigned.
- Vessel operators will be pre-registered through the state’s oil spill volunteer registrations website and be pre-trained and make themselves available for “just in time” training if activated. It is assumed that the VOOs will be called out using the registration system and not self-deploy.

⁴ In emergency management “just in time” training means that a pre-developed training package is designed to be delivered at the time it is most needed during an oil spill.

Components of an Effective Deterrence Program

The eventual success in deterring whales during an oil spill will depend on the spill scenario (type of oil and conditions at the time of the spill), the timing of the tactic, the experience and expertise of the people employing the tactic, and the degree to which whales respond to the stimulus.

The components of an SRKW deterrence program will include:

- A systematic method to survey and locate whales relative to the movement of the oil spill, using all available information from aerial reconnaissance, sighting networks, the whale watch industry, and other sources.
- Maintaining and continuing to renew the existing permit that allows the Federal On Scene Coordinator⁵ to deter whales from encountering the oil.
- Ready access to deterrence stimulus that will bother and turn killer whales away from oil, but not cause harm. This equipment should be strategically pre-staged to avoid delays in response.
- An organized fleet of competent vessels to field the deterrence stimulus between the whales and the oil.
- A Unified Command⁶ for the spill response, operating under a daily Incident Action Plan that will provide intelligence and direction to the deterrence team.
- Long-term funding mechanisms for implementing the program and continuing research into efficacy of deterrence measures.
- Coordination with British Columbia to ensure equal capability within the Salish Sea.

In Canada, killer whales are listed as endangered under the Species at Risk Act. In November of 2016, Canada launched a national \$1.5 billion [Oceans Protection Plan](#) to improve marine safety, responsible shipping, and environmental protection, which includes addressing threats to marine mammals. This includes funding for coastal habitat restoration, action to better understand and address the cumulative effects of shipping on marine mammals, and a review of the effectiveness of management and recovery actions underway for the SRKW.

⁵ Federal On Scene Coordinator is a designation for an individual that provides access to federal resources and technical assistance during an oil spill. For spills in the marine environment, the United States Coast Guard provides this function.

⁶ In the Incident Command System, a Unified Command is the decision making authority structure to manage oil spills.

Authority, permits, and the Northwest Area Contingency Plan

The risk of killer whale exposure to oil must be considered relative to the risk associated with deterrence. A spill specific decision will be made, using the tools and guidance developed in the [Northwest Area Contingency Plan](#)⁷ and laws and regulations currently in effect.

Current laws and regulations

Like all marine mammals, killer whales are protected under the Marine Mammal Protection Act (MMPA). In 2003, the SRKW population was listed as depleted under the MMPA. As noted above, the SRKW population was listed as endangered in 2005. The Federal Oil Pollution Act of 1990, incorporated into the National Contingency Plan, requires that a Fish and Wildlife and Sensitive Environment Plan be developed in consultation with U.S. Fish and Wildlife Services, the National Oceanic and Atmospheric Administration (NOAA), and other interested parties, including state fish and wildlife agencies. Additionally, federal regulations require the plan as an annex to area plans such as the Northwest Area Plan. National Marine Fisheries Service (NMFS) and Washington Department of Fish and Wildlife (WDFW) have provided recommended protocols for deterring killer whales in the inland waters of Washington and these have been incorporated into [Section 9310 – Northwest Wildlife Response Plan](#)⁸ of the Northwest Area Contingency Plan.

Aligning deterrents with laws and regulations

The use of deterrents on killer whales would impact the killer whales and must be consistent with federal laws that protect SRKWs. The MMPA prohibits harassing, harming, or killing marine mammals, but has an exemption for federal or state employees if the harassment to marine mammals is necessary for the health and safety of the animals or for human safety. The ESA also prohibits harassment, harm, or killing of listed species, but does not have a specific exemption for federal and state employees. However, NMFS has authorized SRKW deterrence activities through a scientific research and enhancement permit (No. 18786) held by NOAA's Marine Mammal Health and Stranding Response Program. The permit has been analyzed and is consistent with protections of the MMPA and ESA and covers oil spill-related actions in Puget Sound and the Salish Sea.

The Northwest Area Contingency Plan is the guidance for spill response in the Pacific Northwest. This plan describes how responses to oil spills are conducted using the Incident Command System (ICS)⁹. Within this system, the Wildlife Branch is formed and coordinates all personnel working with wildlife, including federal, state and local agencies, the responsible party, commercial and non-profit organizations, and volunteers. This oil spill response plan includes information on some tools and techniques that could be used to minimize killer whale's exposure to spilled oil.

⁷ Northwest Area Contingency Plan can be found at <https://rrt10nwac.com/>.

⁸ The wildlife response plan for the Northwest Area Contingency Plan can be found at <https://rrt10nwac.com/Files/NWACP/2018/Section%209310%20v19.pdf>.

⁹ Incident Command System is a standardized approach to the command and control of an emergency, including oil spills.

The permit will be managed under the responsibility of the Federal On Scene Coordinator for the spill.

Deterrence methods, tools, and appropriately sized vessels

One of the currently approved methods to deter killer whales is the use of Oikomi pipes from numerous vessels. There may be other tools that can be used, but this curriculum focuses on Oikomi pipe deterring.¹⁰ The purpose of Oikomi pipe deterring is to intercept whales that are approaching oil and to change their direction to avoid oil exposure. The Oikomi pipes have been tested to ensure that they do not cause permanent damage to the whales' hearing. The desired outcome is that the vessel maneuvers and the sound produced by banging the pipes result in an orderly change in the whales' direction of travel.



Figure 1: Deployment of Oikomi pipe

The pipes are constructed from reverberant metal, and the intended use is one pipe per vessel. This operational tactic calls for coordinated lines of vessels to work in close range to whales. Oikomi pipes are deployed over the side of boats and operated manually by striking with a hammer. Vessels should be large enough for safe operation under the existing environmental conditions while providing a stable platform that is close enough to the water so that personnel can work safely for extended periods. At a minimum, two people are required on each boat: a boat operator and a pipe banger. This tactic requires a high degree of seamanship and may not be feasible at night or during poor sea conditions.

Two caches of Oikomi pipes exist in Washington. Twenty-one pipes are located on San Juan Island under the control of the [Islands Oil Spill Association](#), and another 20 Oikomi pipes are stored with the WDFW in Olympia, Washington. Decisions on whether and where to deploy this

¹⁰ Other approved methods for deterrence may include citizen reporting, aircraft, and underwater hydrophone systems to help detect and track whales.

tactic will be made under a Unified Command. Decision makers may look for areas of waterway constriction, where whales have multiple travel options to deter away from the oil. The vessel maneuvers will be coordinated under a field supervisor. Detailed instructions will be provided to crews through the ICS-204 Assignment List form and during operational briefings ahead of the work. NOAA has the technology to be able to track VOO locations as they report whale sightings and conduct deterrence, and display the locations in the [Environmental Response Management Application](#), an online mapping tool that integrates both static and real-time data.

Use of the “OilSpills101” website for registering vessels of opportunity

In 2012, the Washington Legislature directed the Department of Ecology to establish an oil spill volunteer coordination system as a part of the state's overall oil spill response strategy. In response, the OilSpills101 website, www.oilspills101.wa.gov, was created, and Ecology has been registering both VOO operators and other volunteers. We currently have over 600 volunteers registered on the site. VOOs are categorized into two types:

- Tier 1 are considered “active” and under contract to oil industry vessel plan holders. They are pre-trained and equipped and participate in drills to improve their skills.
- Tier 2 are pre-registered and agree to be trained “just in time” if they are called for and are available during an oil spill.

The website is used to inform potential VOO about training opportunities, provide access to the Northwest Area Contingency Plan, and will be updated to include information about the Governor’s Executive Order. Part of this curriculum will include encouragement for the whale watching industry to register through this system. The system will be tested during drills and exercises and will be the mechanism for volunteer call out in the event of an oil spill.

Outreach and communication plan

The goal for communication of this curriculum is to increase VOO response capacity to protect SRKW by expanding enlistment of whale watching vessels and operators. There is a small network that currently has tested volunteer capacity to conduct deterrence, working with NOAA and the WDFW and using grants for funding. An communications plan will use existing organizations and venues to conduct the outreach. Successful outreach will lead to sufficient depth in the pre-registration system.

The following is an initial list of potential resources that are available to assist in outreach and registration activities, locate, or be called upon to deter SRKWs in an oil spill.¹¹

¹¹ Additional marine mammal resources can be found in Section 9312 – Oil Spill Marine Mammal Resources of the Northwest Area Plan at <https://rrt10nwac.com/Files/NWACP/2018/Section%209312%20v19.pdf>

- [Pacific Whale Watch Association](#)
- [Islands Oil Spill Association](#)
- [Orca Network](#)
- Langley Whale Center
- [USCG Auxiliary](#)
- Tribal Vessel Operators
- [Whale Museum](#)
- [Northwest Fisheries Science Center](#)
- NMFS West Coast Regional Office
- [Center for Whale Research](#)
- [SR3 Sealife Rescue Rehabilitation and Research](#)
- [Marine Resources Committee, San Juan County](#)

Additionally, coordination with British Columbia is a best practice to ensure compatibility across the international border.

- [Fisheries & Oceans Canada – British Columbia Marine Response Network](#)
- [BC Cetacean Sighting Network](#)
- [Lifeforce Whale and Dolphin Hotline](#)

Outreach will support three phases of the curriculum: awareness, training, and implementation.

Awareness

- Partner with Pacific Whale Watch Association, Islands Oil Spill Association, and other similar organizations to provide awareness of the program to vessel owners.
- Employ many tools, including a website, brochure, video, targeted presentations, webinars, brochure, and social media to communicate goals of the VOO program and promote volunteer enlistment.

Training and implementation

- Develop a training plan, training schedule, and implementation plan after consulting the whale watching industry. Ask them what works best for them.
- Have a ready to go “just in time” training package to use should a large spill occur.

Training plan and materials

The training for this curriculum will take a competency-based approach. After completion of the training, VOO operators will be able to:

- Under the direction of a Unified Command, safely maneuver boats and maintain position at a specific latitude and longitude.
- Read and follow a plan for implementing hazing using Oikomi pipes and documenting whale exposure and response.
- Read and follow an incident specific Site Safety Plan and ICS-204 form to guide daily activities.
- Communicate with team leaders.
- Deploy and operate Oikomi pipes in a safe manner that is sustainable for a couple of hours or more.
- Maneuver boats with Oikomi pipes in the water at slow speed, or recover Oikomi pipes and reposition the boat to redeploy Oikomi pipes.

A course booklet will be developed and provided to each participant to track their training. A certificate will be provided upon completion of the training. A variety of training delivery methods will be used, including website, videos, vessel visits, face-to-face visits, and webinars.

The content of training will be no more than 8 hours total, covering broad health and safety related topics and specific oil spill deterrence functions. Participants will:

- Gain a basic understanding of the fate and effect of oil when spilled into the environment.
- Gain familiarity with ICS and understand how deterrence activities relate to ICS.
- Understand the care and use of PPE.
- Understand what hazardous substances are and their associated risks in an emergency.
- Understand the role of a first responder at the awareness level, including site security and control, and limitations of actions that can be performed at this level of training.
- Gain ability to use the Department of Transportation Emergency Response Guidebook.¹²
- Be able to recognize the need for additional resources when in the field, and the need to notify the incident's communication center accordingly.
- Learn wildlife safety and deterrence techniques.
- Learn to read the Job Hazard Analysis and a site-specific Health and Safety Plan.
- Gain understanding of an Incident Action Plan and how to effectively communicate with the Unified Command during a response.
- Understand the scientific research and enhancement permit.
- Understand post emergency response requirements, such as incidental oiling decontamination.

After training is completed, ongoing oil spill drills will be organized to provide on-water practice with boats and equipment.

¹² DOT Emergency Response Guide is a job aid for first responders to help identify hazards in an oil spill response.