

DEPARTMENT OF
ECOLOGY
State of Washington

2016 Salish Sea Oil Spill Risk Mitigation Workshop

Summary Report

December 2016
Publication no. 17-08-005

Publication and Contact Information

This report is available on the Department of Ecology's website at <https://apps.ecology.wa.gov/publications/SummaryPages/1708005.html>

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2016 Salish Sea Oil Spill Risk Mitigation Workshop

Summary Report

Spill Prevention, Preparedness and Response Program
Washington State Department of Ecology
Olympia, Washington

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Acknowledgements

This project has been funded wholly or in part by the United States Environmental Protection Agency under assistance agreement PC-00J90701 through the Washington Department of Fish and Wildlife. The contents of this document do not necessarily reflect the views and policies of the Environmental Protection Agency or the Washington Department of Fish and Wildlife, nor does mention of any trade names or commercial products constitute endorsement or recommendation for use.

Overview

The *Salish Sea Workshop: Vessel Oil Spill Risk Assessment and Management* took place on October 18–19, 2016 at the Whatcom United Emergency Coordination Center in Bellingham, Washington. The workshop was sponsored by the Washington State Department of Ecology (Ecology). Strategic planning, workshop management and reporting for the workshop were provided by Dally Environmental and Veda Environmental under contract to Ecology.

The workshop participants were invited from Washington and British Columbia and included representatives from industry, state agencies, Tribes and First Nations, Canadian and US federal agencies, and non-governmental organizations. A complete list of the participants is provided in Appendix A.

This document provides a high-level summary of the workshop process and outcomes and includes links to documents and other resources that were made available to workshop participants.

Workshop goals and objectives

The goal of the workshop was to develop and agree upon specific actionable recommendations and associated implementation strategies to address the 5 to 10 highest priority prevention-focused Risk Mitigation Measures (RMMs) for reducing and further preventing oil spills from vessel traffic in the Strait of Juan de Fuca and the Salish Sea.

The objectives of the workshop were to:

1. Develop a common understanding of any changes in risk related to changes in vessel traffic since the January 2015 Salish Sea Workshop, including the 2015 Vessel Traffic Risk Assessment (VTRA) results and the impacts on vessel traffic from the lifting of the U.S. export ban, changes in crude by rail, and new pipeline projects.
2. Review, revise, and agree to potential prevention-focused Risk Mitigation Measures.
3. Evaluate and prioritize Risk Mitigation Measures.
4. For the 5 to 10 highest priority mitigation measures, develop detailed actionable recommendations.
5. Get participant commitment to:
 - a. Support the results of the workshop.
 - b. Participate in the implementation process.
 - c. Identify champions to move recommendations forward.
 - d. Advocate for the workshop recommendations in their daily work.

Workshop context and scope

In January 2015, Ecology held a workshop (Salish Sea Workshop: Vessel Oil Spill Risk Assessment and Management) in which participants identified seven categories of risk for oil spills associated with vessel traffic patterns in the Strait of Juan de Fuca and the Salish Sea. Within each category, participants identified specific risk factors and began to identify mitigation measures to address each risk factor. The 2016 workshop built and expanded on the 2015 effort, incorporating new recommendations from studies and efforts that have taken place since January 2015.

The 2016 workshop concentrated on prevention-focused RMMs that will help reduce the risk of oil spills from vessel traffic in the Strait of Juan de Fuca and the Salish Sea. Examples of RMM topics that were addressed in the workshop include: anchorages, bunkering and oil transfers, general waterways management, vessel movement, tug escorts, and collaboration and information sharing.

The workshop did not address the following topics:

- Acceptability of vessel-related risk.
- Permitting, environmental impact statement/environmental assessment processes, or acceptability of existing and proposed facility projects.
- Spill response capability, preparedness, or planning.
- Environmental or socioeconomic impacts of vessel-related spills.

Workshop process and design

The workshop planning process included initial research on oil spill RMMs and the development of a workshop design and facilitation plan to achieve the goal and objectives established for the workshop. These activities are described below.

RMM research

The first step in the workshop design process was to research and compile existing RMMs for prevention, preparedness and response to oil spills in the Strait of Juan de Fuca and the Salish Sea. The RMMs were compiled from 15 sources including reports, vessel traffic studies, and the 2015 workshop. This initial research effort produced over 225 RMMs, too many to prioritize in a single workshop. Therefore, Ecology limited the focus of the workshop to address *only* prevention RMMs. The prevention RMMs were the launching point for the workshop and are listed in Appendix D. The 15 sources used to identify these RMMs are also cited in Appendix D.

The RMMs were grouped into the following categories and with associated sub-categories:

1. Anchorage
 - a. Anchorage for laden tankers
 - b. Tankers as floating storage
 - c. Anchorage locations

2. Bunker/oil transfer
 - a. Bunker standards of care
 - b. Bunker practices
 - c. Advance notice of transfer

3. General waterways management
 - a. Designated fishing areas
 - b. Other waterways management
 - c. Pier design and operations
 - d. Equipment and construction standards
 - e. Aids to navigation
 - f. Pending Risk Mitigation Measures
 - g. Pilotage standards

4. Vessel movement
 - a. Vessel speed
 - b. Future waterways planning
 - c. Vessel tracking and routing
 - d. 125,000 deadweight tonnage restriction
 - e. Watch operations

5. Tug/escort
 - a. Escort requirements
 - b. Cross-border response tug

6. Coordination and information sharing
 - a. Transboundary coordination
 - b. Data sharing and management
 - c. Education and outreach

A second list of RMMs addressing *non-prevention* recommendations (e.g., preparedness and response recommendations) is provided in Appendix 1 of the *Workshop Participant Handbook*, which is available online on Ecology's Spill Prevention website.¹ The non-prevention RMMs were not included in the 2016 Salish Sea Workshop discussion and are provided in the handbook for reference only.

¹ www.ecy.wa.gov/programs/spills/prevention/RiskAssessment.html

Workshop design

The workshop was designed to provide participants an opportunity to discuss and agree to priority prevention RMMs. Given the large number of prevention RMMs (75) to prioritize, the overall workshop design included small group breakout sessions to a) refine the language of each RMM, b) identify additional RMMs that were missing, c) select the top 5 to 10 RMMs through a voting process, and d) prioritize and propose implementation strategies. The overall plan for the two-day process is captured in Figure 1.

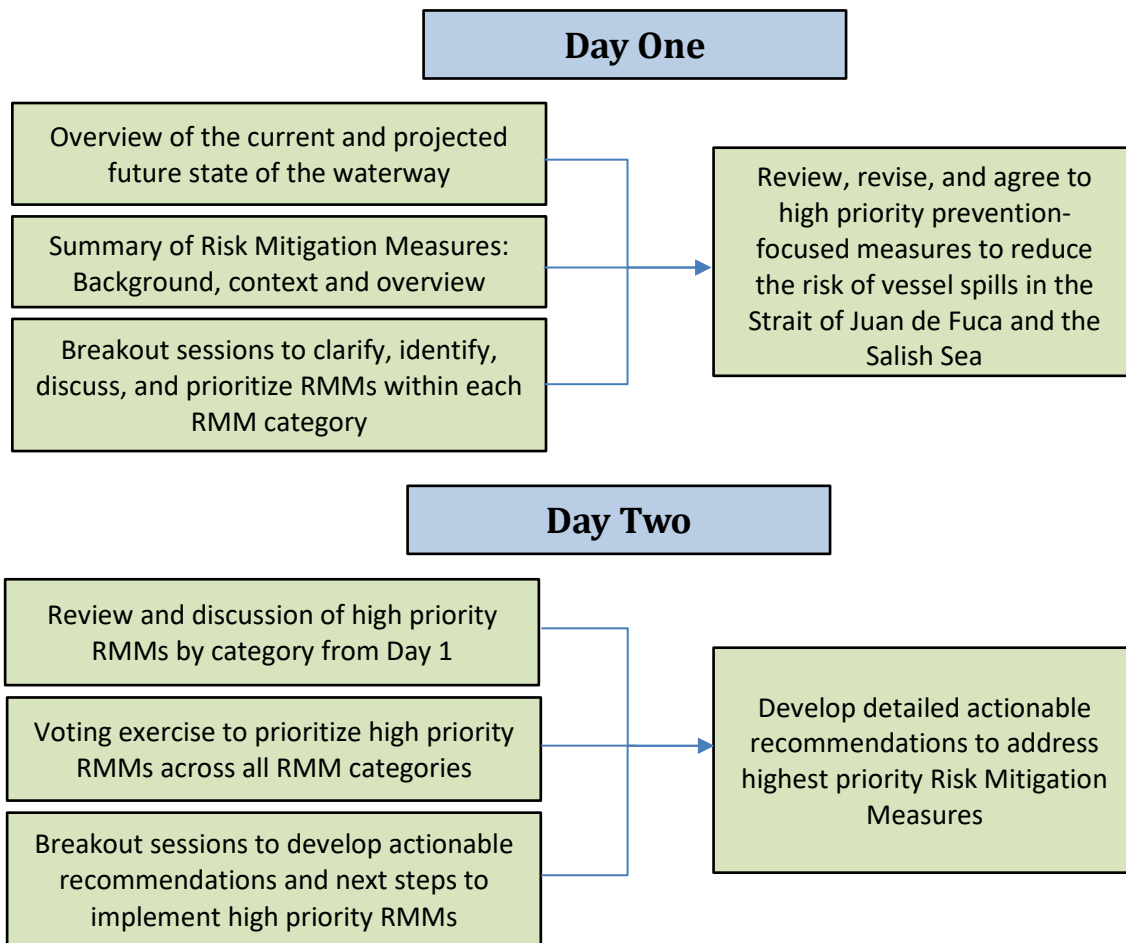


Figure 1. Workshop overview

Overview of the current and projected future state of the waterway

The workshop opened with a welcome from the Lummi Nation, an overview of the agenda and process, and a discussion of tribal views of waterway risks. A series of presentations were given, as listed in the agenda (Appendix C), to describe the current and projected future state of vessel traffic on the Strait of Juan de Fuca and the Salish Sea. All presentations are available on Ecology's website.²

During the discussion of the projected future state of the waterway, Ecology provided an update on the 2015 Puget Sound Vessel Traffic Risk Assessment (2015 VTRA) process and results. The 2015 VTRA was sponsored by Ecology and conducted by researchers from George Washington University/Virginia Commonwealth University. A collaborative workgroup consisting of Puget Sound Harbor Safety Committee members provided input and feedback throughout the study process. The 2015 VTRA included a base case of 2015 vessel traffic in the study area (Puget Sound and the southern Strait of Georgia) and future scenarios that examined how risk could change in a number of "what-if" scenarios. The 2015 VTRA also included risk mitigation cases to explore actions that could be taken with a goal of reducing potential oil loss from tankers, cargo vessels, and tug/barges. Ecology described preliminary results for participants to consider when reviewing RMMs.

RMM prioritization process

Following the overview of the current and projected future state of the waterway, participants self-selected into breakout groups. Each group addressed one of the six RMM categories previously described. Two categories (coordination and information sharing, and general waterways management) were split into two breakout groups each due to the large number of RMMs contained within those categories. Ecology's intent in participating in the breakout session was to help facilitate discussion and to encourage open dialogue within the forum.

The breakout groups reviewed their specific list of RMMs and prioritized the top RMMs within their category. Each breakout group then reported their priority RMMs to all workshop participants. Workshop participants had an opportunity to question each breakout group's decisions, and in some cases, the resulting priorities were modified to reflect input from the larger group.

This process resulted in a narrowing of the original list of RMMs from 75 to 24 recommendations distributed across the RMM categories.

Day 2 began with a voting process to identify the highest priority RMMs across all six categories. Each participating organization received eight dots to apply to their choice of the 24 RMMs. Nine RMMs received the most votes. Workshop participants discussed the results in a large group setting, and had the opportunity to elevate any RMMs that were eliminated in the prioritization process. The group did not request to add any additional RMMs back in after reviewing the results of the prioritization process.

² www.ecy.wa.gov/programs/spills/prevention/RiskAssessment.html

The diagram below (Figure 2) depicts the major steps in the prioritization process through which the original list of 225 RMMs was narrowed down to 75, then 24, then nine priority RMMs.

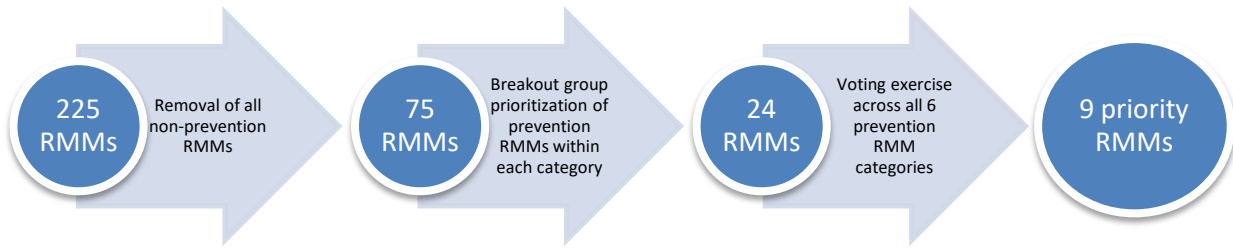


Figure 2. Process diagram for RMM selection

The nine priority RMMs are listed in Table 1 below. The complete list of 24 RMMs, along with information about how many votes each RMM received, is provided in Appendix B.

Table 1. Top nine prioritized Risk Mitigation Measures

RMM#	NAME
1	Escort tank vessels including oil barges and articulated tug barges (ATBs) in Puget Sound.
2	Create a Canada/U.S. Transboundary Marine Safety Forum.
3	Pre-position a multi-mission emergency response towing vessel (ERTV) for Haro Strait/Boundary Pass.
4	Conduct a Ports and Waterways Safety Assessment (PAWSA) for the Port Angeles precautionary area and Rosario Strait.
5	Share transboundary marine incident data.
6	Support implementation of the pending Risk Mitigation Measures (increased automatic identification system [AIS] carriage, Vessel Traffic Service [VTS] upgrades, protected fuel tanks, 46 CFR Subchapter M, ³ fishing vessel inspections) that are described in RMM #3m in Appendix D.
7	Broaden the oil spill prevention community with “Keep it in the tank” education and outreach campaign
8	a. Require a minimum two-person bridge watch on tugs towing laden barges carrying pollutants in the Vessel Traffic Service zone.
	b. Require a minimum two-person bridge watch on commercial vessels in reduced visibility.
9	Optimize anchorage number/ location.

³ Inspection standards for commercial towing vessels

Implementing strategies and entities

Once participants agreed to the highest priority RMMs, participants worked in breakout sessions to develop implementation plans. The breakout groups discussed and proposed the following elements for each of the nine high priority RMMs:

1. Description of recommendation
2. Intent of recommendation
3. Implementing process
4. Applicable geographic area
5. Expected timeline to implement
6. Recommended implementation strategies
7. Next steps to implementation
8. Proposed RMM champion [Note: An RMM champion is a person or entity that is recommended to take the next step to move the RMM forward. A champion does not necessarily need to have the resources or authority to enact the RMM.]

The implementation plans developed for each of the priority RMMs in the breakout sessions are provided in Appendix E. Ecology's intent in participating in the development of implementation plans during the breakout sessions was to help facilitate implementation of next steps and encourage open dialogue within the forum. Further discussion between Ecology and proposed champions and implementing organizations is anticipated.

Key observations from final list of Risk Mitigation Measures

- Based on the participants' voting, the topics of most interest for improved prevention efforts focused on escort tugs, transboundary coordination, waterways management, education and outreach, and increased bridge watch.
- Of the proposed implementation processes, recommendations include using or expanding on existing organizations or structures such as the Harbor Safety Committee model or the Pacific States/British Columbia Oil Spill Task Force.
- Most RMMs were considered implementable within a two- to five-year time frame.
- The geographic reach of the RMMs extends through most of the Salish Sea, including Haro Strait, Boundary Pass, and the Strait of Juan de Fuca.
- The nine highest priority RMMs were identified through a collaborative process that included transboundary maritime transportation system members.

Highlights from Discussion

Areas of agreement and disagreement

During the workshop, issues and concerns were raised by participants with regard to the scope, intent, and/or feasibility of some of the proposed RMMs. Below is a summary of the comments/concerns/questions raised by participants.

Vessel speed:

- A participant was not entirely comfortable with the proposal recommending across-the-board vessel speed reductions, since there are some conditions where slower speeds can create a hazard (currents, weather conditions, etc.).

Additional anchorages:

- A participant noted that, given the deep channels and the limited protected and sheltered areas in the Strait of Juan de Fuca and the Salish Sea, it is difficult to find adequate new anchorage sites. This limits the opportunity to add additional anchorages.
- A participant recommended considering noise and light pollution when placing new anchorage sites.

Transboundary:

- A participant expressed interest in a future discussion with Canadians regarding the workshop's tug escort proposal (RMM #1: Escort tank vessels including oil barges and articulated tug barges in Puget Sound).
- A participant recommended creating a new transboundary entity focused on waterway marine safety, with initial efforts focused on a stakeholder mapping exercise. Recommended participants included Ecology, the Puget Sound Harbor Safety Committee, Pacific States/British Columbia Oil Spill Task Force, USCG Sector Puget Sound, and Transport Canada/Canadian Coast Guard.

Bunkering:

- A participant expressed the need for more mitigation for bunkering alongside marine terminals.

Participant perspectives and comments

1. A participant commented via note card: "Make sure to remember that there is a good system currently in place. It would be beneficial to sometimes focus on improving implementation of the RMMs that we currently have in place rather than create new ones. Sometimes new initiatives can take resources from existing systems and that could have an adverse effect."
2. The following comment was received via note card: "No bunkering at night. No bunkering in adverse sea states/weather."

3. Some participants expressed concern that in their view, there were few representatives from Canadian environmental non-governmental organizations at the workshop.
4. A participant recommended further discussion on how Canadians might engage on transboundary topics such as anchorage and tug escorts.
5. A participant commented that further deliberation is needed on comparability of U.S. and Canadian regulations in the transboundary waterways to enhance the effectiveness of Risk Mitigation Measures.
6. Several participants requested that environmental non-governmental organization representatives be included in a presentation or panel discussion during future workshops.

Next Steps

At the conclusion of the workshop, the following next steps were proposed:

- Ecology should post presentations, workshop materials, and the final report on Ecology's website.⁴
- Workshop participants should stay engaged and keep the dialogue going after the workshop.
- RMM champions, Ecology, and other partners should work together to review their specific RMM in the context of other prevention activities, work groups, task forces, and committees. After this review, they should work together to update the RMM as needed and develop a plan of action.
- Ecology should send periodic updates to workshop participants describing progress toward reviewing and developing plans of action for the nine priority RMMs. It should be noted that participation in implementation activities recommended as a result of this workshop is non-binding. If it is determined that an RMM cannot be implemented at this time, then the barriers to implementation should be documented, and the RMM included for consideration in future workshops.

⁴ Workshop materials are now available at www.ecy.wa.gov/programs/spills/prevention/RiskAssessment.html.

Appendices

Appendix A. Workshop participants

Appendix A is a list of the organizations and individuals who attended this workshop. A list of all invited organizations can be found in the workshop handbook.⁵

Organization	Name
Alaska Tanker Company	Hays, Karen
American Bureau of Shipping	Baldinelli, Darnell
BC Ferries	James, Leslie
BP Cherry Point	McCreery, Scott
BP Shipping	Obermeier, Carl
Canadian Coast Guard	Statham, Art
Chamber of Shipping of British Columbia	Gee, Bonnie
Clear Seas	Mathieson, Meghan
Clear Seas	Wiefelspuett, Richard
Consulate General of Canada	Rajasansi, Harkiran
Council of Marine Carriers (BC)	Nelson, Phillip
Evergreen Islands	Glade, Tom
Friends of the San Juans	Alderton, Jan
Friends of the San Juans	Buffum, Stephanie
Islands Trust	Frater, Clare
Lummi Nation	Davis, Scott
Lummi Nation Councilmember	Julius, Jeremiah
Lummi Nation	Kuhlman, Kara
Makah Tribe	Bowechop, Chad
Makah Tribe	Nelson, Laura
Marine Exchange of Puget Sound	Reed, Cynthia
Mulno Cove Consulting for Friends of the San Juans	Pratt, Lovel
NOAA	Curran, Janet
NOAA Emergency Response Division	Stark, Jesse
Northwest Straits Commission	Broadhurst, Ginny
Pacheedaht First Nation Councillor	Charlie, Tracy
Pacheedaht Nation	Pearson, Kristine
Pacific Merchant Shipping Association	Moore, Mike
Pacific Pilotage Authority	Young, Brian
Pacific States/British Columbia Oil Spill Task Force	Brace, Sarah

⁵ www.ecy.wa.gov/programs/spills/prevention/SalishSea2016/2106SalishSeaParticipantHandbook.pdf, p.17.

Phillips 66	Crabbs, Bill
Port Gamble S’Klallam Tribe	Phillips, Samuel J.
Port of Bellingham	Clement, Neil
Port of Everett	Gordon, Fred
Puget Sound Partnership	Hass, Todd
Puget Sound Partnership	Solien, Stephanie
Puget Sound Pilots	Kalvoy, Jostein
Puget Sound Pilots	Marmol, Ed
Puget Soundkeepers Alliance	Wilke, Chris
Puget Soundkeepers Alliance	Wishart, Bruce
RE Sources	Ury, Eddy
Samish Indian Nation	Bluhm, Jodi
Samish Indian Nation	Woodard, Todd
San Juan County	Green, Marta
San Juan County	Stephens, Jamie
Seaspan	Russell, Kyle
Shell	LaBlond, Rick
Shell Puget Sound Refinery	Biletnikoff, Neil
Skagit County	Kloes, Dale
Tesoro	McCaughey, Robert
Trans Mountain	Faucett, Kris
Trans Mountain	Kanjilal, Bikram
Transport Canada	Wallace, Michael
USCG District 13	McFarland, Bob
USCG Sector Puget Sound	Fu, Hsingyen
USCG Sector Puget Sound	Jensen, Darwin
USCG Sector Puget Sound	Raymond, M. W.
Veda Environmental	Skoff, Beth
Washington Department of Ecology	Baldi, Josh
Washington Department of Ecology	Ferguson, Scott
Washington Department of Ecology	Jensen, Dale
Washington Department of Ecology	Kirk, Brian
Washington Department of Ecology	Thompson, Sara
Washington Department of Ecology	Crews, Lori
Washington Department of Ecology	Reichert, Jason
Washington Department of Ecology	Stone, Mark
Washington Department of Natural Resources	Cothorn, Shayne
Washington Environmental Council	Ponzio, Rebecca
Washington Maritime Cooperative	Callahan, Thomas
Washington State Ferries	Price, Robert
Washington State Labor Council	Province, Lori

WAVE Consulting/Friends of the Earth	Felleman, Fred
Western States Petroleum Association	Holmes, Frank
Western States Petroleum Association	Irish, Ed
Witt O'Briens	Morris, Jim

Appendix B. Voting score and ranking of prevention RMMs during the workshop

Appendix B presents the RMMs that were revised and selected as the top 24 RMMs during the Day 1 breakout discussions.

NOTE: This table reflects the edits and changes that were made during the breakout sessions to the original list of RMMs provided in the handbook. These 24 RMMs were then voted upon on Day 2, with the top nine RMMs receiving the most votes (highlighted).

RMM CATEGORY	RMM #	Prevention Risk Mitigation Measures	Vote (Number of dots)	Ranking (top 9) RMMS)
Anchorage Locations	1	Consider establishing more anchorages to reduce congestion.	15	#9
	2	Require vessels to avoid anchoring and conducting vessel operations in particularly sensitive environmental and culturally important areas. The Harbor Safety Committee's Anchoring Standard of Care can be referenced when developing this requirement. (NOTE: This is already happening with tribal consultation)	0	
Bunker/Oil Transfer Advance Notice of Transfer	3	Expand Advance Notice of Transfer (ANT) reporting requirements to include: <ul style="list-style-type: none"> Type of crude oil being transferred. Name of tug towing barge and if barge is laden. 	5	
General Waterways Management Other Waterways Management	4	Encourage ship owners to provide critical system (e.g. steering, propulsion) redundancy in the design of their vessels.	2	
General Waterways Management Pier Design and Operations	5	Assess and ensure pier design adequacy for larger vessels (e.g., bollards, Mooring Restraint Capability, etc.)	9	
General Waterways Management Equipment and Construction Standards	6	Require inert gas systems on barges carrying volatile oil as is required for oil tankers to prevent explosions.	2	

RMM CATEGORY	RMM #	Prevention Risk Mitigation Measures	Vote (Number of dots)	Ranking (top 9) RMMS)
General Waterways Management Aids to Navigation	7	Assess placement of additional aids to navigation in Haro Strait, Boundary Pass, and Rosario Strait to enhance vessel safety in the area. Special attention to Beaumont Shoal.	7	
General Waterways Management Pending Risk Mitigation Measures	8	Support implementation of IMO/USCG enhancements, including increased AIS carriage, VTS upgrades, PAWSA, protected fuel tanks, 46 CFR subchapter M impacts, fishing vessel inspections, and encourage Canadian implementation.	22	#6
General Waterways Management Pilotage Standards	9	Ensure maintenance of ongoing proficiency and competence of pilots.	4	
	10	Formalize and harmonize periodic cross-border meetings to discuss standard operating pilot practices.	2	
Vessel Movement Vessel Speed	11	Consider requiring a reduction in speed for all vessels to the safest, slowest speed. Analyze the impact of restricting speed for containerships (and other large vessels), to reduce the likelihood of collisions in congested areas, considering: <ul style="list-style-type: none"> • Tidal influence • Human and wildlife impact 	0	
Vessel Movement Future Waterways Planning	12	Oppose projects whose risks cannot be mitigated.	2	
	13	Now that the export ban has been lifted, require transparency in the permitting and public review process. Require risk evaluations, updates of spill response and contingency plans, and public disclosure of exporting crude oil.	1	
Vessel Movement Watch Operations	14	Require two-person bridge watch on all commercial vessels operating in a Regulated Navigation Areas or reduced visibility operations. And also on tugs towing laden barges carrying pollutants within VTS zone.	16	#8
	15	Conduct a PAWSA for the Port Angeles Rotary Area (include CVTS in PAWSA study) and for Rosario Strait.	32	#4
	16	Consider moving Puget Sound Pilot Station further farther west	1	

RMM CATEGORY	RMM #	Prevention Risk Mitigation Measures	Vote (Number of dots)	Ranking (top 9) RMMS)
Tug/Escort Escort Requirements	17	Develop double tug escort requirements for laden tank vessels for narrow waterways including near Guemes and Saddlebag Islands.	1	
	18	Define high-risk vessels (e.g. tanker > 40,000 DWT, non-protected bunker tanks, etc.) required to have tug escort.	3	
Tug/Escort Escort Requirements	19	Escort tank vessels, including towed oil barges and ATBs carrying greater than 5,000 long tons of oil as cargo, throughout entire Puget Sound east of Port Angeles.	56	#1
Tug/Escort Cross Boarder Response Tug	20	Pre-position a multi-mission ERTV for Haro Strait/Boundary Pass.	51	#3
Coordination and Information Sharing Transboundary Coordination	21	Establish a Canada/U.S. transboundary Marine Safety Forum. Actions: <ul style="list-style-type: none"> As part of this committee, develop a comparative matrix of cross boundary efforts (i.e., entities, committees, coordination groups, teams, councils) Locate a funding source 	53	#2
Coordination and Information Sharing Data Transparency	22	Increase transparency and sharing of waterway incident data between the United States and Canada. Actions: <ul style="list-style-type: none"> Standardize the definitions of vessel incidents in the Strait of Juan de Fuca and the Salish Sea to help facilitate USCG, Canadian CG, and Transport Canada marine casualty information sharing and data compatibility. Require consistent classification of commercial vessel types datasets created by the Coast Guard in the US and Canada to facilitate future analysis. 	25	#5
Coordination and Sharing Data Transparency	23	Develop an electronic cross-boundary data system for vessel traffic information in which vessel type is consistently defined and verified. This data system should also include information about cargo type and volume.	7	

RMM CATEGORY	RMM #	Prevention Risk Mitigation Measures	Vote (Number of dots)	Ranking (top 9 RMMS)
Coordination and Sharing Education and Outreach	24	Develop a comprehensive outreach system with strategies and tactics that is: <ul style="list-style-type: none"> • Bi-national • Multi-stakeholder including Tribes and First Nation, other government organizations • 2-way communication system • Address education on maneuverability/visibility of large vessels • Oil spill prevention education 	19	#7

Appendix C. Workshop agenda

DAY 1: Tuesday, 18 October 2016

- 8:00 WELCOME** – The Honorable Jeremiah Julius, Councilmember, Lummi Nation
- 8:30 SAFETY BRIEFING AND ECOLOGY WELCOME** – Dale Jensen, Program Manager, WA State Dept. of Ecology Spill Prevention, Preparedness and Response Program
- 8:40 WORKSHOP OVERVIEW** – Lisa Dally Wilson, Dally Environmental, and Hilary Wilkinson, Veda Environmental, Workshop Facilitators
- Workshop goals and objectives
 - Agenda review
 - Meeting ground rules, sideboards, and decision making approach
- 8:50 TRIBAL AND FIRST NATIONS VIEWS ON WATERWAY RISK** – Chad Bowechop, Makah
- 9:15 CURRENT STATE OF THE WATERWAY: THE EXISTING RISK/SAFETY PICTURE AND HOW IT IS BEING ADDRESSED** (Where are we now)
- *US Coast Guard* – Captain M. W. (Joe) Raymond, USCG, Sector Commander, Sector Puget Sound
 - *Transport Canada* – Michael Wallace, Transport Canada
 - *Pacific Pilotage Authority* – Brian Young or Representative, Pacific Pilotage Authority
 - *Puget Sound Pilots* – Captain Edmond Marmol, Puget Sound Pilots
 - *WA State* – Scott Ferguson, Prevention Section Manager, WA State Dept. of Ecology Spill Program
- 10:30 BREAK**
- 10:45 FUTURE STATE OF THE WATERWAY: WHAT IS THE PROJECTED RISK/SAFETY PICTURE** (Where are we headed)
- Key findings from 2015 Vessel Traffic Risk Assessment (VTRA), Scott Ferguson, Spill Prevention Manager, and Brian Kirk, Marine Risk Lead, WA Dept. of Ecology
 - Current trends in vessel traffic, Captain Mike Moore, Pacific Merchant Shipping Association (PMSA), Bonnie Gee, Vice President, Chamber of Shipping of British Columbia
- 12:15 WORKING LUNCH**

12:45 RISK MITIGATION MEASURES: Background, Context, Overview

- Key outcomes and findings from Jan. 2015 Salish Sea Risk Mitigation Workshop – Scott Ferguson, Spills Prevention Manager, WA Dept. of Ecology
- Overview – Process/Methodology/Approach for Identifying Risk Mitigation Measures (RMMs), Sarah Brace, Veda Environmental
- RMM prioritization process for workshop participants, Lisa Dally Wilson, Dally Environmental and Hilary Wilkinson, Veda Environmental

1:30 RISK MITIGATION MEASURE (RMM) PRIORITIZATION

Participants self-select to breakout groups by RMM topic area including:

1. Anchorage
 - Anchorage for laden tankers
 - Tankers as floating storage
 - Anchorage locations
2. Bunker/oil transfer
 - Bunker standards of care
 - Bunker practices
 - Advance notice of transfer
3. General waterways management
 - Designated fishing areas
 - Other waterways management
 - Pier design and operations
 - Equipment and construction standards
 - Aids to navigation
 - Pending Risk Mitigation Measures
 - Pilotage standards
4. Vessel movement
 - Vessel speed
 - Future waterway planning
 - Vessel tracking and routing
 - 125K DWT Restriction in Puget Sound
 - Watch operations
5. Tug/escort
 - Escort requirements
 - Cross-border response tug
6. Coordination and information sharing
 - Transboundary coordination
 - Data sharing and management
 - Education and outreach

Breakout group assignment:

1. Review/discuss RMMs, clarify, revise
2. Prioritize RMMs

3:15 BREAK

3:45 BREAKOUT GROUPS REPORT BACK AND LARGE GROUP Q&A

- Major changes to list of RMMs
- Prioritization results

5:15 OVERVIEW OF DAY TWO

5:30 ADJOURN

DAY 2: Wednesday, 19 October 2016

8:00 WELCOME – ANNOUNCEMENTS AND AGENDA OVERVIEW

8:15 REVIEW DAY ONE OUTCOMES

- Review high priority RMMs by category resulting from Day 1 breakout sessions
- Large group discussion
- Q&A

9:00 PRIORITIZE HIGH PRIORITY RMMs ACROSS ALL RMM CATEGORIES

- Large group exercise

10:00 BREAK

10:15 SUMMARY OF RESULTS AND BREAKOUT GROUPS BY HIGH PRIORITY RISK MITIGATION MEASURE

Participants self-select to breakout groups for each of the 5 to 10 top ranking RMMs based on expertise and interest

Breakout group assignment:

- Clarify RMM and define as a recommendation(s)
- Discuss strategies to implement the RMM recommendation(s)
- Complete implementation worksheet⁶ for the RMM recommendation(s)

12:15 NETWORKING LUNCH

1:15 BREAKOUT GROUPS REPORT BACK AND LARGE GROUP DISCUSSION

⁶ Completed worksheets informed the implementation plans found in Appendix E.

3:15 BREAK

3:30 SUMMARIZE RESULTS OF WORKSHOP

4:00 NEXT STEPS AND FOLLOWUP (Ecology)

4:30 ADJOURN

Appendix D. Salish Sea Workshop 2016 – original Risk Mitigation Measures for Oil Spill Prevention from Participant Handbook

RMM Category #	RMM Category	Prevention Risk Mitigation Measures
1	Anchorage	<p><u>Anchorage for Laden Tankers:</u></p> <p>a. Require tankers to specify when they are laden when making an anchorage reservation with VTS and track this information for reference and use in future risk assessments.¹</p>
1	Anchorage	<p><u>Tankers as floating storage:</u></p> <p>b. Analyze data to characterize anchorage usage with regard to tanker storage and other use.¹</p> <p>c. Clarify the definition of “storage” status for tankers on the water.¹</p> <p>d. Analyze the risk from the practices of multiple berthing, partial discharging, and anchoring of tankers carrying oil. Consider whether these practices should be eliminated with the exception of case-by-case situations, such as when facility operations require floating storage or partial discharges or when sailing offshore would increase the risk of a spill.²</p>
1	Anchorage	<p><u>Anchorage Locations:</u></p> <p>e. Consider establishing more anchorages to reduce congestion (away from ferry lanes).¹</p> <p>f. Require vessels to avoid anchoring and conducting vessel operations in particularly sensitive environmental and culturally important areas. The Harbor Safety Committee's Anchoring Standard of Care can be referenced when developing this requirement.¹</p>
2	Bunker/Oil Transfer	<p><u>Bunker Standards of Care:</u></p> <p>a. Ensure that the Puget Sound Harbor Safety Plan Bunkering Standard of Care is regularly updated.¹</p>
2	Bunker/Oil Transfer	<p><u>Bunker practices:</u></p> <p>b. Investigate ways to minimize transits between bunkering locations and final locations.¹</p> <p>c. Evaluate limiting or moving bunkering activities to locations where enhanced prevention and preparedness capabilities exist or could be established.²</p>

RMM Category #	RMM Category	Prevention Risk Mitigation Measures
2	Bunker/Oil Transfer	<u>Advance Notice of Transfer:</u> d. Expand Advance Notice of Transfer (ANT) reporting requirements to include: ⁴ <ol style="list-style-type: none"> 1. Type of crude oil being transferred. 2. Name of tug towing barge, and if it is laden. 3. Destination of outbound crude.
3	General Waterways Management	<u>Designated Fishing Areas:</u> a. Designate areas for fishing between shipping lanes and piers. ¹
3	General Waterways Management	<u>Other Waterways Management:</u> b. Encourage ship owners to provide redundancy in the design of their vessels. ^{5,6} c. Expand government patrol vessels to police safety in narrow shipping lanes. ⁷ d. Employ moving safety zones around tankers, particularly if implemented in conjunction with mandatory AIS. ⁷
3	General Waterways Management	<u>Pier design and operations:</u> e. Examine pier design adequacy for larger vessels. ¹ f. Examine adequacy of dock/transfer mechanism, and bollards for use with larger vessels. ¹
3	General Waterways Management	<u>Equipment and construction standards:</u> g. Require that newly constructed and expanded facilities implement ship vetting procedures or contractual agreements with shippers calling at their docks. This could occur through a process such as the project permitting process. This vetting could include a check on compliance with IMO Oil Fuel Tank Protection requirements for independent fuel tanks. ² h. Require inert gas systems on barges carrying volatile oil as is required for oil tankers to prevent explosions. ⁴

RMM Category #	RMM Category	Prevention Risk Mitigation Measures
3	General Waterways Management	<p><u>Aids to navigation:</u></p> <ul style="list-style-type: none"> i. Install lighted ranges in key locations to indicate if a ship is travelling on a safe course over ground, or staying within the appropriate traffic lane. Each range would consist of a pair of fixed lights onshore, that, when visually aligned, indicate a preferred line of approach. More specifically, optimal course headings to and from terminals in the Cherry Point area and the Southern Strait of Georgia using Rosario Strait could be marked by:³ <ul style="list-style-type: none"> 1. Range lights placed on Blakely Island and Lummi Island for the leg from Buoy “C” to Lydia Shoal. 2. Range lights on Orcas Island for the leg between Lydia Shoal and Cape St. Mary. 3. Range lights on Burrows Island for the leg from Cape St. Mary to Davidson Rock. j. Install additional traffic separation buoys in mid-channel to divide inbound and outbound traffic.³ k. Place additional aids to navigation in Haro Strait, Boundary Pass, and Rosario Strait to enhance vessel safety in the area.³ l. Assess Duncan/Duntze Rock nav. aid(s).³
3	General Waterways Management	<p><u>Pending Risk Mitigation Measures:</u></p> <ul style="list-style-type: none"> m. Model pending IMO/USCG enhancements, including increased AIS Carriage, VTS upgrades (PAWSS), protected fuel tanks, 46 CFR Subchapter M impacts, fishing vessel inspections.¹⁴
3	General Waterways Management	<p><u>Pilotage Standards:</u></p> <ul style="list-style-type: none"> n. Ensure robust pilotage recruitment.¹ o. Coordinate cross-border standards for piloting.¹ p. Require vessels to provide pilots with bollard pull certifications, see BC pilot requirements as an example.¹ q. Two pilots should be assigned to all loaded tankers and maintain a combined oversight of the vessel's bridge and her movements. r. Ensure ships should have adequate towing capability in an emergency.

RMM Category #	RMM Category	Prevention Risk Mitigation Measures
4	Vessel Movement	<u>Vessel speed:</u> <ol style="list-style-type: none"> a. Consider requiring a reduction in speed for larger container ships, potentially to a max speed of 17 knots. ^{1,5,6,10} b. Analyze the impact of restricting speed for containerships (and other large vessels), to reduce the likelihood of collisions in congested areas. ² c. Employ a voluntary speed reduction program in Haro Strait, Boundary Pass, and Rosario Strait. ³ d. Require vessel speed reductions to reduce noise exposure to Southern Resident Killer whales, particularly in their critical habitat. e. Require tank vessel wind restriction. ¹⁰
4	Vessel Movement	<u>Future Waterway Planning:</u> <ol style="list-style-type: none"> f. Establish a long-term waterways management plan to accommodate increased vessel traffic in the Salish Sea. ² g. Establish an appropriate vessel traffic service for the waterways of Grays Harbor, Columbia River, and the outer coast. ²
4	Vessel Movement	<u>Vessel Tracking and Routing:</u> <ol style="list-style-type: none"> h. Develop Preliminary Area Transit (PAT) Plans to provide VTS with a rudimentary plan for transiting the area using real-time traffic information. VTS would not approve or reject submitted plans, but would use the information to compare a vessel's intended transit with the intended transits of other vessels, thereby enabling VTS to identify potential traffic conflicts well in advance of their development in reality. ³ i. Continue VTS Puget Sound software upgrade to the Port and Waterways Safety System (PAWSS) 2.2. j. Consider one way traffic management practices for Haro Strait, Boundary Pass, portions of Georgia Strait, and Rosario Strait for vessel types to include oil barge towing operations. k. Consider one way traffic management practices for ATBs in Rosario. ⁵ l. Require that all vessels have AIS Transponders. ⁷ m. Require tugs to update their AIS signal to indicate whether they are towing a barge and if it is laden. ⁴

RMM Category #	RMM Category	Prevention Risk Mitigation Measures
4	Vessel Movement	<u>125,000 DWT Restriction:</u> n. Remove 125,000 DWT restriction in Puget Sound. ¹⁴
4	Vessel Movement	<u>Watch operations:</u> o. Require two-person lookout during RNA or reduced visibility operations. ¹ p. Double oil barge watch. ⁵

RMM Category #	RMM Category	Prevention Risk Mitigation Measures
5	Tug/escort	<p><u>Escort Requirements:</u></p> <ul style="list-style-type: none"> a. Require tug escorts for specific classes of vessels or locations such as: <ul style="list-style-type: none"> 1. All vessels > 40,000 DWT with tethering. ⁵ 2. Articulated tug barges (ATBs) over 40,000 DWT with tethering. ¹ 3. Vessels Panamax and larger in Puget Sound. ³ 4. Cape Class bulk carriers on Haro and Rosario routes. ^{5,6} 5. Cape Class bulk carriers, laden tankers, & ATB in Rosario. ^{5,6} 6. All vessels (tankers, barges, ATBs) carrying toxic cargo (e.g., toluene, diluents, diluted bitumen). ^{1,3} 7. Priority 1 Transits as rated by the USCG Port State Control. ¹¹ b. Require double tug escorts for specific classes of vessels or locations such as: <ul style="list-style-type: none"> 1. Laden tankers. ^{5,6} 2. All liquid bulk carriers, regardless of commodity. ¹ 3. Vessels in Boundary Pass/Haro Strait/ Strait of Georgia/East Point. ⁵ c. Identify high risk vessels (tanker > 40,000 DWT, non-protected bunker tanks...) and develop tethered tug escort requirements and standards for “high risk” vessels, based on the probability of human error or mechanical failure. ¹ d. Analyze the effectiveness of a pre-positioned ERTV(s), stationed in the vicinity of Turn Point at the junction of Haro Strait and Boundary Pass, near the entrance to Grays Harbor, and the mouth of the Columbia River. ² e. Escort towed oil barges and ATBs carrying greater than 5,000 long tons of oil as cargo, throughout entire Puget Sound east of Port Angeles. ¹⁴ f. Escort Kinder Morgan tankers to Buoy J. ¹⁴

RMM Category #	RMM Category	Prevention Risk Mitigation Measures
5	Tug/escort	<p><u>Cross-border response tug:</u></p> <ul style="list-style-type: none"> g. Pre-position a cross-border rescue tug for Haro Strait/Boundary Pass. ^{1,3,14} h. Review and edit escort requirements so that they are consistent across the Canadian/US border for Boundary Pass/Haro Strait/ Strait of Georgia/East Point and coordinate US/Canadian bilateral standards for tug escorts (tethered vs. non-tethered). ¹ i. Evaluate cross-border response tug constraints. ¹ j. Station an Emergency Response Towing Vessel in the San Juan Islands to prevent spills, especially of diluted bitumen, that is sufficiently sized to prevent a vessel from drift grounding. ^{3,7} k. Equip potential towing vessels with equipment necessary to perform free-oil recovery. ¹⁰ l. Designate tug loitering areas. ¹
6	Coordination and Information sharing	<p><u>Transboundary Coordination:</u></p> <ul style="list-style-type: none"> a. Establish a Transboundary Harbor Safety Committee. ^{8,12} b. Locate a funding source for cross-border meetings about risk analysis. ¹ c. Re-establish the Sea Use Council, created in 1969, to facilitate dialogue on marine issues between the United States and Canada in the Northwest. ⁴ d. Use the United States /Canada International Joint Commission (IJC; www.ijc.org) to deal with United States / Canadian transboundary topics. ⁸ e. Develop method for United States /Canada sharing of bunkering best practices. ¹ f. Require consistent classification of commercial vessel types datasets created by the Coast Guard in the United States and Canada to facilitate future analysis.

RMM Category #	RMM Category	Prevention Risk Mitigation Measures
6	Coordination and Information sharing	<p><u>Data sharing and management:</u></p> <ul style="list-style-type: none"> g. Ensure that incident data distinguishes between bunkering vessels and towing vessels. ¹ h. Standardize the definitions of vessel incidents in the Salish Sea to help facilitate USCG and CCG marine casualty information sharing and data compatibility. ¹ i. Increase transparency and sharing of waterway incident data between the United States and Canada. ¹ j. Apply collaboration lesson learned from the ship rider program to the spill prevention mission. ¹ k. Share advanced notice of transfer (ANT) information with all areas. ¹ l. Develop an electronic cross-boundary data system for vessel traffic information in which vessel type is consistently defined and verified. This data system should also include information about cargo type and volume. ¹⁵
6	Coordination and Information sharing	<p><u>Education and outreach:</u></p> <ul style="list-style-type: none"> m. Notify the US Coast Guard Captain of the Port when and where there are fishery openings (examine possibility of making notifications earlier than current practice). ¹ n. Notify ferries of the locations of fishing nets. ¹ o. Educate fishermen on maneuverability/visibility of large vessels, including ferries. ¹ p. Require/encourage fisherman to use radar reflectors and participate in AIS. ¹ q. Require training and certification of watch keepers on fishing vessels. ¹ r. Enhance Rule 9 and 10 compliance by balancing with tribal treaty rights, considering AIS requirement for all vessels, and continuing strong Harbor Safety Committee commitment to encouraging compliance. ¹ s. Engage local government, Tribes, and citizens to establish a forum to engage and involve those interested in oil spill prevention and response planning. ¹⁰ t. Encourage local government, Tribes, and interested citizens to participate in Harbor Safety Committee and Area Committee meetings. ¹⁰

Prevention Risk Mitigation Measure Resources

Below is a list of the resources reviewed in the development of the Prevention Risk Mitigation Measures Table. The superscript numbers adjacent to the RMMs in the table indicate the resource from which they originated.

1. Salish Sea Workshop: *Vessel Oil Spill Risk Assessment & Management Summary*, 2015 <https://apps.ecology.wa.gov/publications/documents/1508010.pdf> Pages 532-570
2. Washington State Department of Ecology, 2015, *Washington State 2014 Marine and Rail Oil Transportation Study*. <https://apps.ecology.wa.gov/publications/documents/1508010.pdf>
3. Glosten Associates, 2014, *Gateway Pacific Terminal (GPT) Vessel Traffic and Risk Assessment Study*. <http://www.ecy.wa.gov/geographic/gatewaypacific/20141104-GPT-VesselTrafficRiskAssessment-Glosten.pdf>
4. Felleman, Fred, 2016, *Tar Sands/Dilbit Crude Oil Movements Within the Salish Sea*. <https://www.scribd.com/doc/310599877/Tar-Sands-Dilbit-CRUDE-OIL-Movments-Within-the-SALISH-SEA-Tar-Sands-Report>
5. *Puget Sound Vessel Traffic Risk Assessment Study, 2010* (“VTRA 2013 Tiered” and “VTRA 2013 Vote” RMMs) <http://www.psp.wa.gov/oilspills.php>
6. Det Norske Veritas, 2013, *General Risk Analysis and Intended Methods of Reducing Risks, Trans Mountain Pipeline Expansion Project*.
7. Badger, Chris, 2014, *Report on the findings of the Pilotage Risk Management Methodology (PRMM) to assess the Use of Escort Tugs in Haro St and Boundary Pass for Liquid Bulk Vessels, In Product, less than 40,000 SDWT*, Project No: PPA2013-0
8. Gaydos J.K., Thixton S., and Donatuto J., 2015, *Evaluating Threats in Multinational Marine Ecosystems: A Coast Salish First Nations and Tribal Perspective*. PLoS ONE 10(12): e0144861. doi:10.1371/journal.pone.0144861 <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0144861>
9. Committee on the Effects of Diluted Bitumen on the Environment, Board on Chemical Sciences and Technology, Division on Earth and Life Studies, and National Academies of Science , Engineering, and Medicine, 2016, *Spills of Diluted Bitumen from Pipelines: A Comparative Study of Environmental Fate, Effects, and Response*. The National Academies Press, Washington, D.C. <https://www.nap.edu/catalog/21834/spills-of-diluted-bitumen-from-pipelines-a-comparative-study-of>
10. Nuka Research and Planning Group LLC, 2015, *San Juan County Oil Spill Response Capacity Evaluation. Report to San Juan County*. http://nukaresearch.com/images/150630_SJC_Oil_Spill_Evaluation_FINAL_w_APPENDICES.pdf
11. National Center Associates, 2000, *North Puget Sound Long-Term Oil Spill Risk Management Panel Final Report and Recommendations*. Publication NO. 00-08-21 <https://apps.ecology.wa.gov/publications/documents/0008024.pdf>
12. Department of Ecology, 2011, *Improving Spill Prevention and Response in Washington State*. http://www.ecy.wa.gov/programs/spills/studies_reports/ecypspreview-dwhcommissionreport.html

13. Houghton J, Holt MM, Giles DA, Hanson MB, Emmons CK, Hogan JT, et al. ,2015, *The Relationship between Vessel Traffic and Noise Levels Received by Killer Whales (Orcinus orca)*. PLoS ONE 10(12): e0140119. doi:10.1371/journal.pone.0140119
<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0140119>
14. *Puget Sound Vessel Traffic Risk Assessment Study, 2015.*
15. Van Dorp, Johan Rene and Jason Merrick, 2014, *VTRA 2010 Final Report – Preventing Oil Spills from Large Ships and Barges in Northern Puget Sound & Strait of Juan de Fuca.*
<https://www.seas.gwu.edu/~dorpjr/VTRA/PSP/FINAL%20REPORT/PSP%20FINAL%20REPORT%20033114%20-%20EXECUTIVE%20SUMMARY%20-%20%20WITH%20LABEL%20CORRECTION%20-%20REDUCED.pdf>

Appendix E. Recommended implementation plans for top nine RMMs

Appendix E provides implementation plans for the top nine Risk Mitigation Measures developed by workshop participants within their breakout sessions. These implementation plans were developed during the workshop using the expert opinion of the breakout group participants. Ecology's intent in participating in the development of implementation plans in the breakout sessions was to help facilitate implementation of next steps and encourage open dialogue within the forum. Further discussion between Ecology and proposed champions and implementing organizations is anticipated.

Ecology edited some of the timeline and champion components of the implementation plans in this appendix in order to better foster RMM implementation. The edited components are noted with an asterisk (*) throughout this appendix.

RMM #1: Escort tank vessels including oil barges and articulated tug barges in Puget Sound

RMM Category: Tug/escort

Description of Recommendation: Implement tug escort of tank vessels including towed oil barges and articulated tug barges (ATBs) carrying greater than 5,000 long tons of oil as cargo throughout the entire Puget Sound east of Port Angeles.

Intent of Recommendation: Reduce the risk of oil spills from the most common classes of tank vessels that are not escorted.

Implementing Process:* Introduce voluntary standards and/or secure state or federal legislation and regulation.

Applicable Geographic Area: All U.S. waters east of a line drawn from Dungeness Light to Discovery Light.

Expected Timeline to Implement:* Work with Puget Sound Harbor Safety Committee on voluntary standards and/or initiate hearings to begin in the 2017 legislative session.

Recommended Implementation Strategies:*

- Work with Puget Sound Harbor Safety Committee on voluntary standards for a Harbor Safety Plan Standard of Care
- Introduce legislation

Next Steps to Implementation:*

- Establish a Puget Sound Harbor Safety Committee workgroup to develop a voluntary standard
- Identify/secure bill sponsor
- Secure broad partnership
- Introduce and pass legislation
- Rulemaking - if necessary

Proposed RMM Champion:*

- Friends of the Earth
- Puget Soundkeeper Alliance
- Puget Sound Harbor Safety Committee

RMM #2: Canada/U.S. Transboundary Marine Safety Forum

RMM Category: Coordination and information sharing

Description of Recommendation: Establish a Canada/U.S. Transboundary Marine Safety Forum.

Intent of Recommendation: Convene responsible and interested parties to promote marine safety solutions.

Implementing Process: * Initial effort should begin with WA Ecology working with the Puget Sound Harbor Safety Committee, Pacific States/British Columbia Oil Spill Task Force, Puget Sound Partnership, USCG Sector Puget Sound, and Transport Canada/Canadian Coast Guard.

Applicable Geographic Area: Strait of Juan de Fuca and the Salish Sea

Expected Timeline to Implement: * 2 to 5 years

Recommended Implementation Strategies:

- Identify, reach out to, and convene responsible and interested parties
- Explore funding opportunities (consider WA State, B.C., Federal Governments, and other funding sources)
- Develop a comparative matrix (stakeholder mapping) of cross-boundary efforts
- Sponsors with authority to act

Next Steps to Implementation: * The timeframe is 2 to 5 years. A possible timeline follows but all are subject to change.

- WA Ecology to initiate discussion with Puget Sound Harbor Safety Committee, Pacific States/British Columbia Oil Spill Task Force, Puget Sound Partnership, USCG Sector Puget Sound, and Transport Canada/Canadian Coast Guard (6 months)
- Identify implementing team from relevant processes (9 months)
- Implementing team convenes and develops budget and objectives (12 months)
- Convene first meeting of forum (18-24 months)

Proposed RMM Champion:*

This effort should begin with WA Ecology initiating discussions with the Puget Sound Harbor Safety Committee, Pacific States/British Columbia Task Force, Puget Sound Partnership, USCG Sector Puget Sound, Transport Canada/Canadian Coast Guard, and the Chamber of Shipping of British Columbia.

RMM #3: A multi-mission emergency response towing vessel (ERTV) for Haro Strait/Boundary Pass

RMM Category: Tug/escort

Description of Recommendation: Implement fit-for-purpose multi-mission ERTV based on Best Achievable Technology for vessels in Haro Strait/Boundary Pass.

Intent of Recommendation: Prevent oil spills from vessels in one of the highest-risk areas.

Implementing Process: Identify supporting organizations and an organizing entity to lead this effort.

Applicable Geographic Area: Haro Strait/Boundary Pass and nearby waters.

Expected Timeline to Implement: 2 to 5 years

Recommended Implementation Strategies:

- Refer to Badger report (2014) on pilotage recommendations (Appendix D, Resources)
- Develop cost/benefit business model (see Neah Bay ERTV success)

Next Steps to Implementation:

- Develop a strong case statement that focuses on building a business model

Proposed RMM Champion:*

This effort should begin with WA Ecology initiating discussions with Pacific States/British Columbia Oil Spill Task Force, working with the Chamber of Shipping of British Columbia, the Puget Sound Marine Exchange, and bilateral federal transboundary partners.

RMM #4: Ports and Waterways Safety Assessment (PAWSA) for Port Angeles Precautionary Area and Rosario Strait

RMM Category: Vessel Movement

Description of Recommendation: Conduct two PAWSAs, one for the Port Angeles Precautionary Area and one for Rosario Strait.

Intent of Recommendation: Improve waterway safety and reduce the number of VTS interventions.

Implementing Process: Recommendation to USCG D13 and USCG Sector Puget Sound.

Applicable Geographic Area:

Port Angeles Precautionary Area (See lat./long. boundaries) and Rosario Strait.

- N limit 48 °, 16.5'
- W limit 123 °, 34'
- S limit 48 °, 12.5'
- E limit 123 °, 23'

Expected Timeline to Implement: 1 year for recommendation letter, 2 years for PAWSA.

Recommended Implementation Strategies:

- Communicate recommendation to USCG District 13 Waterways Management
- USCG conducts PAWSA
- USCG should coordinate with CVTS during PAWSA

Next Steps to Implementation:

- Draft letter to the Puget Sound Harbor Safety Committee Chairman requesting endorsement and signatures from Harbor Safety Committee members for this PAWSA request to the USCG
- Send letter to USCG District 13 Waterways Management copy to USCG Sector Puget Sound requesting the two PAWSAs
- Check on the status of the request 3 months after the letter is delivered
- Check on the status again 6 months after the letter is delivered
- If no response is received after 6 months, request a meeting with the USCG District 13 Chief, Waterways Management and Commander, USCG Sector Puget Sound

Proposed RMM Champion:*

Puget Sound Partnership and Ecology should initiate a discussion on this topic with the Puget Sound Harbor Safety Committee.

RMM #5: Transboundary marine incident data sharing

RMM Category: Coordination and Information Sharing

Description of Recommendation: Increase transparency and sharing of waterway incident data between the U.S. and Canada.

Intent of Recommendation: Improved marine safety through incident data analysis.

Implementing Process:* Potential topic for newly formed Canada/U.S. Transboundary Marine Safety Forum (RMM #2). WA Ecology to support conversation and discussion on this topic with the Puget Sound Harbor Safety Committee, Pacific States/British Columbia Oil Spill Task Force, USCG Sector Puget Sound, and Transport Canada/Canadian Coast Guard.

Applicable Geographic Area: Strait of Juan de Fuca and the Salish Sea

Expected Timeline to Implement:* 2 to 5 years

Recommended Implementation Strategies:

- Understand and acknowledge the differences, compatibility issues, and reporting requirements of existing information systems
- Develop a means to translate the relevant fields of data for shared use
- Identify and resolve security and public disclosure obstacles to information sharing

Next Steps to Implementation:

- Request that Canadian Transportation Safety Board, Transport Canada/Canadian Coast Guard, U.S. Coast Guard, Cooperative Vessel Traffic Service, Joint Coordinating Group, and pilot organizations provide applicable data to start the comparison process
- Clarify the reason for and purpose behind the sharing of transboundary incident data and identify what types of analysis is to be done with this data and what types of understanding is needed (e.g. to understand incidents)
- Connect to RMM #2

Proposed RMM Champion:*

This effort should begin with WA Ecology initiating discussions with the Puget Sound Harbor Safety Committee, Pacific States/British Columbia Oil Spill Task Force, USCG Sector Puget Sound, and Transport Canada/Canadian Coast Guard.

RMM #6: Supporting implementation of pending Risk Mitigation Measures

RMM Category: General Waterways Management

Description of Recommendation: See title.

Intent of Recommendation: Proactively help with the implementation of pending Risk Mitigation Measures described in the RMM #3m in Appendix D (increased AIS Carriage, VTS upgrades, protected fuel tanks, 46 CFR Subchapter M, fishing vessel inspections) with the intended result of having these measures implemented as soon as possible and in concert with rule schedule.

Implementing Process: Puget Sound Harbor Safety Committee and other appropriate entities.

Applicable Geographic Area: Entire waterway

Expected Timeline to Implement: Varies according to the RMM implementation schedules.

Recommended Implementation Strategies:

- Puget Sound Harbor Safety Committee to work with stakeholders to develop communication strategies for each pending measure
- Use Pacific Marine Expo, publications, etc., to reach the groups that need to implement each RMM, stressing safety aspects

Next Steps to Implementation:

- Develop marketing/implementation strategies
- Have the Puget Sound Harbor Safety Committee convene subcommittees/workgroups with stakeholders to disseminate the information to groups and to solicit ideas
- Recommend/encourage government based incentives, e.g., reduced registration and inspection fees, taxes, etc.

Proposed RMM Champion:*

WA Ecology to initiate conversations with the Puget Sound Harbor Safety Committee, USCG Sector Puget Sound, and industry about this RMM.

RMM #7: Broadening the oil spill prevention community with “Keep it in the tank” education and outreach campaign

RMM Category: Coordination and Information Sharing

Description of Recommendation: Develop a comprehensive outreach program/system with strategies and tactics that are:

- Bi-national
- Multi-stakeholder, including Tribes, First Nations and other government organizations
- Two-way communication system

Intent of Recommendation: Inform all water user groups how to more effectively participate in oil spill prevention activities. Goals/outcomes:

- Address education on maneuverability/visibility of large vessels including ferries
- Oil spill prevention education
- Data-driven messaging
- Messaging around cumulative effects

Implementing Process:* WA Ecology to support conversation and discussion on this topic with the Puget Sound Harbor Safety Committee, Pacific States/British Columbia Oil Spill Task Force, USCG Sector Puget Sound, and Transport Canada/Canadian Coast Guard. Potential topic for newly formed Canada/U.S. Transboundary Marine Safety Forum (RMM #2).

Applicable Geographic Area: Strait of Juan de Fuca, Salish Sea, and its major approaches

Expected Timeline to Implement: Phased approach needed.

Recommended Implementation Strategies:

- Keep message fresh
- Add outreach mandate to Transboundary Marine Safety Forum (RMM #2).
- Seek funding sources to support effort
- Connect this effort with the Transboundary data collaboration effort described in RMM #5

Next Steps to Implementation:

- Pacific Oil Spill Prevention Education Team (POSPET)⁷ input

⁷ <http://oilspilltaskforce.org/education/pospet>

- Convene stakeholder and Tribal input group
- Develop comprehensive outreach plan that identifies target audience

Proposed RMM Champion:*

WA Ecology to initiate a conversation about this RMM with the Puget Sound Harbor Safety Committee, Pacific States/British Columbia Oil Spill Task Force, USCG Sector Puget Sound, Transport Canada/Canadian Coast Guard, the Chamber of Shipping of British Columbia, and the future Transboundary Marine Safety Forum from RMM #2.

RMM #8a: Require a minimum two-person bridge watch on tugs towing laden barges carrying pollutants in the Vessel Traffic Service zone

RMM Category: Vessel Movement

Description of Recommendation: See title.

Intent of Recommendation: Reduce probability of accidents by increasing situational awareness. Increase safety by building in redundancy.

Implementing Process:* Puget Sound Harbor Safety Committee should consider the possibility of a Standard of Care. The Puget Sound Harbor Safety Committee should work with American Waterway Operators (AWO) in this process.

Applicable Geographic Area: CVTS operating area

Expected Timeline to Implement:* 2 to 5 years

Recommended Implementation Strategies:* Puget Sound Harbor Safety Committee Operations Committee to lead the development of a Standard of Care. The Puget Sound Harbor Safety Committee should work with AWO in this process.

Next Steps to Implementation:

- Volunteer to suggest new Standard of Care to Puget Sound Harbor Safety Committee.
- Develop Standard of Care.
- Publish Standard of Care.

Proposed RMM Champion:*

WA Ecology to support a conversation on this topic with AWO, the USCG through USCG Sector Puget Sound, and the Puget Sound Harbor Safety Committee.

Notes:

- It is the USCG's responsibility via 46 CFR Subchapter M to determine towing vessel crewing via their Officer in Charge of Marine Inspection (OCMI) authority.
- Fatigue and manning implications should be considered when assessing feasibility.
- A breakout group member suggested considering whether Washington State adopts RMM#1 (Escort tank vessels including oil barges and articulated tug barges in Puget Sound). If RMM #1 is not adopted, then the breakout group member suggested consideration be given to the idea of elevating this proposed Standard of Care to proposed state legislation/regulation.

RMM #8b: Require a minimum two-person bridge watch on commercial vessels in reduced visibility

RMM Category: Vessel Movement

Description of Recommendation: See title.

Intent of Recommendation: Reduce probability of accidents by increasing situational awareness. Increase safety by building in redundancy.

Implementing Process:* Puget Sound Harbor Safety Committee should consider the possibility of a Standard of Care. The Puget Sound Harbor Safety Committee should work with American Waterway Operators (AWO) in this process.

Applicable Geographic Area: CVTS operating area.

Expected Timeline to Implement:* 2 to 5 years

Recommended Implementation Strategies:* Puget Sound Harbor Safety Committee Operations Committee to lead the development of a Standard of Care. The Puget Sound Harbor Safety Committee should work with AWO in this process.

Next Steps to Implementation:

- Volunteer to suggest new Standard of Care to the Puget Sound Harbor Safety Committee.
- Develop Standard of Care.
- Publish Standard of Care.

Proposed RMM Champion:*

WA Ecology to support a conversation on this topic with AWO, the USCG through USCG Sector Puget Sound, and the Puget Sound Harbor Safety Committee.

Notes:

- It is USCG's responsibility via 46 CFR Subchapter M to determine towing vessel crewing via their Officer in Charge of Marine Inspection (OCMI) authority.
- Fatigue and manning implications should be considered when assessing feasibility.

RMM #9: Optimize anchorage number/ location

RMM Category: Anchorage

Description of Recommendation: Consider adding more or alternate anchorages to reduce congestion and enhance vessel safety to minimize risk to environmental/tribal areas.

Intent of Recommendation: Minimize traffic flow/congestion and navigational risk from loitering vessels.

Implementing Process: US Coast Guard

Applicable Geographic Area: Strait of Juan de Fuca and Salish Sea; Puget Sound Pacific States/British Columbia Oil Spill Task Force

Expected Timeline to Implement: Posting of draft Federal Register notice is in process. Estimated project completion is the end of 2017.

Recommended Implementation Strategies:

- Support U.S. Coast Guard anchorage process during public comment period
- Provide input from all vested parties
- Coordinate Canadian counterparts to maximize anchorage opportunities
- Engage all tribal governments for input
- Reach out to fishing industry and other vested parties for input using public meetings or other communications

Next Steps to Implementation:

- Increase size of existing anchorage and/or change dimensions to accommodate larger vessels
- Consider ferry lanes, lighting, noise and environmental/tribal sensitivity
- Review area contingency plans for emergency anchorage as part of the anchorage updates
- Consider weather, nature of bottom, and debris-free anchorage areas

Proposed RMM Champion:*

- USCG Sector Puget Sound

Notes:* A participant noted that given the deep channels and the limited protected and sheltered areas in the Strait of Juan de Fuca and the Salish Sea, it is difficult to find adequate new anchorage sites. This limits the opportunity to add additional anchorages.

Appendix F. Workshop participant handbook, presentations and other resources

All materials, presentations and additional resources for the 2016 Salish Sea workshop are located on Ecology's website:

www.ecy.wa.gov/programs/spills/prevention/RiskAssessment.html

Appendix G. Glossary of terms

AIS: Automatic Identification System

ATB: Articulated Tug Barge

AWO: American Waterways Operators

CFR: Code of Federal Regulations

CCG: Canadian Coast Guard

COTP: Captain of the Port

CVTS: Cooperative Vessel Traffic Service

ERTV: Emergency Response Towing Vessel

HSC: Harbor Safety Committee

JCG: Joint Coordinating Group

PAWSA: Ports and Waterways Safety Assessment

POSPET: Pacific Oil Spill Prevention Education Team

PSHSC: Puget Sound Harbor Safety Committee

RMM: Risk Mitigation Measure

SOC: Standard of Care

TC: Transport Canada

USCG: United States Coast Guard

VTS: Vessel Traffic Service