



2018 Washington Marine Debris Action Plan

September 2018

2018 Washington Marine Debris Action Plan

September 2018

Acknowledgement

The Washington Marine Debris Action Plan is the result of a productive and collaborative effort. Many thanks go to the participants of the two workshops, as well as other regional partners, who provided the content of this plan; to the planning and support teams for the planning and execution of the workshops; to Kara Cardinal, for coordinating the process; and to the NOAA Marine Debris Program for supporting and facilitating the creation of the plan.

For citation purposes, please use:

National Oceanic and Atmospheric Administration Marine Debris Program (2018). 2018 Washington Marine Debris Action Plan. Silver Spring, MD: National Oceanic and Atmospheric Administration Marine Debris Program.

For more information, please contact:

NOAA Marine Debris Program
Office of Response and Restoration
National Ocean Service
NOAA Western Regional Center
7600 Sand Point Way NE Bldg. 3,
Seattle, WA 98115
<https://MarineDebris.noaa.gov/>

Nir Barnea, Pacific Northwest Regional Coordinator
nir.barnea@noaa.gov

This publication does not constitute an endorsement of any commercial product or intend to be an opinion beyond scientific or other results obtained by the National Oceanic and Atmospheric Administration (NOAA). No reference shall be made to NOAA, or this publication furnished by NOAA, to any advertising or sales promotion which would indicate or imply that NOAA recommends or endorses any proprietary product mentioned herein, or which has as its purpose an interest to cause the advertised product to be used or purchased because of this publication.

Table of Contents

| | |
|--|-----------|
| List of Acronyms | 4 |
| Introduction | 5 |
| Action Plan Purpose..... | 6 |
| Action Plan Process | 6 |
| Action Plan Terms..... | 6 |
| Marine Debris Goals, Strategies & Actions | 6 |
| Goal 1: Prevention | 8 |
| Goal 2: Removal | 15 |
| Goal 3: Research | 22 |
| Goal 4: Coordination | 28 |
| Appendix I: Additional Actions | 32 |
| Appendix II: List of Participants | 34 |
| Appendix III: Actions by Debris Type | 37 |

List of Acronyms

| | |
|-----------------|---|
| ADV | Abandoned and derelict vessels |
| ALD | Abandoned, lost, or otherwise discarded |
| COASST | Coastal Observation and Seabird Survey Team |
| EPA | Environmental Protection Agency |
| EPS | Expanded polystyrene |
| MDAP | Marine Debris Action Plan |
| MRC | Marine Resources Committee |
| NERR | National Estuarine Research Reserve |
| NGO | Non-governmental organization |
| NOAA MDP | National Oceanic and Atmospheric Administration Marine Debris Program |
| NPS | National Park Service |
| OCNMS | Olympic Coast National Marine Sanctuary |
| PCSGA | Pacific Coast Shellfish Growers Association |
| USCG | United States Coast Guard |
| USFWS | United States Fish and Wildlife Service |
| UW | University of Washington |
| WashPIRG | Washington Public Interest Research Group |
| WDFW | Washington Department of Fish and Wildlife |
| WDNR | Washington Department of Natural Resources |
| WDOL | Washington Department of Licensing |

Introduction

In the United States, marine debris is defined as “any persistent solid material that is manufactured or processed, directly or indirectly, intentionally or unintentionally, disposed of or abandoned into the marine environment or the Great Lakes.” Marine debris is a growing global problem that harms the environment and commerce, as well as threatens navigation safety and human health.

Throughout Washington, numerous organizations have worked diligently to prevent and remove marine debris from our shorelines and marine waters. Since 1971, marine debris removal has been conducted along Washington’s Pacific Coast and throughout the Puget Sound. Outreach projects have targeted recreational and commercial fishermen to reduce gear loss and increase reporting of lost gear. Educational programs for children and adults have been developed to increase awareness of marine debris and encourage actions to prevent it.

Marine debris is a large-scale problem, and its prevention and removal efforts benefit greatly from partnerships and collaboration. The accomplishments achieved by partnerships and the realization that much can be gained by banding together to address marine debris, has resulted in enthusiastic support by many partners for the creation of the Washington Marine Debris Action Plan (WA MDAP). As in other regions across the United States, the National Oceanic and Atmospheric Administration Marine Debris Program (NOAA MDP) emphasizes the importance of partner contributions to similar regional and state action plans, prioritizes supporting and facilitating the creation of this action plan, and is committed to supporting the WA MDAP for years to come.

This WA MDAP focuses on marine debris activities to be carried out under normal conditions. Large-scale debris removal operations associated with major disasters are covered under [federal](#) and [state](#) emergency management plans, and the Washington State Marine Debris Coordination Plan. Other plans touch on specific types of debris, such as the Northwest Straits Foundation’s [Puget Sound Lost Crab Pot Prevention Plan](#) and Washington Department of Natural Resources (WDNR) program to [remove creosote-treated materials](#) from the Puget Sound.

Additionally, in Washington State much of the tidelands are held in private ownership. Private and public tidelands are managed differently, and this needs to be considered when conducting any sort of cleanup activities.

Participants highlighted the following considerations when applying the Action Plan:

- Respect for tribal treaty rights;
- The importance of citizen science. In this Plan, the term “citizen science” refers to community-based science, where any member of the community may participate;
- Consideration of environmental justice, equity, diversity, and inclusion.

Marine debris and plastic pollution are complex challenges that impact diverse communities in Washington and around the world. Considering that marine debris can impact some communities or ethnicities more than others, it is critical to seek diverse collaborators in developing solutions, participating in actions, and doing so in culturally competent ways, including language considerations and materials best suited for different communities. This includes lower-income communities, communities of color, and communities of various ethnicities, whose voices and ideas are important to implementing holistic and effective marine debris prevention and reduction measures.

Action Plan Purpose

The purpose of the WA MDAP is to facilitate and track actions that prevent and reduce marine debris throughout Washington State, including the Puget Sound, the Northwest Straits, Washington's Pacific Coast, the Columbia River estuary, and inland sources.

Action Plan Process

The process of creating the WA MDAP began in 2017 when meetings with potential stakeholders indicated strong support for such a plan. A coordinator was hired to move creation of the WA MDAP forward, and a planning team of marine debris stakeholders in Washington was assembled to assist with the process and provide valuable input. Next, a workshop was held in Ocean Shores, Washington in December 2017, where over 50 participants drafted goals, strategies, and future actions. An Interim draft of the Plan was generated after the workshop and circulated for review and comments. A second workshop was held in May 2018 in Lacey, Washington to complete the Plan. Input from that workshop was incorporated into the draft Plan, which was then circulated for review and finalized.

Action Plan Terms

For the final WA MDAP, participants agreed on the following terms:

- **Overall Action Plan duration:** The overall Action Plan duration is six years. After six years, the Plan will be thoroughly evaluated and modified as needed.
- **Action plan operational cycle:** The Action Plan operational cycle is two years. At the end of an operational cycle, participants will meet at a workshop to update the Plan.
- **Communication:** A newsletter detailing Action Plan progress will be drafted every six months with content provided by the participating entities.

Marine Debris Goals, Strategies & Actions

The tables below are the core of the Action Plan. They list goals, strategies, and ongoing and future actions that contribute to achieving the Action Plan's goals. [Appendix III](#) lists the actions by debris type.

Marine debris is a complex issue, not readily amenable to neat categories and clear-cut delineation. The partners recognized that there is no perfect way to organize this plan, and some of the actions may overlap or fit into more than one goal or strategy. Facilitating the execution of the actions to address marine debris is the primary purpose of this Action Plan.

Goals

Workshop participants agreed on four goals for the WA MDAP:

Goal 1: Prevention

Prevent the generation of marine debris through coordinated actions that include community engagement, policy changes, best management practices, and incentive programs.

Goal 2: Removal

Locate, identify, remove, and recycle or dispose of land- and ocean-based marine debris from Washington's shorelines and waters.

Goal 3: Research

Conduct coordinated, high-quality research to inform actions that reduce the adverse impacts of marine debris.

Goal 4: Coordination

Coordinate marine debris actions effectively throughout Washington State.

Strategies

In the context of this Action Plan, the strategies define how each goal will be achieved. Typically, there are several strategies per goal.

Actions

Actions are projects and activities supporting a strategy, undertaken to achieve the associated goal. Current/ongoing and future actions are listed for each goal.

In this Action Plan, Leads and Partners are entities that have volunteered to carry out a given action, pending the availability of resources (funding, staff, time, materials, etc.). **Leads**, when listed, are represented in **bold letters**.

Actions labelled with "†" are also found in Northwest Straits Foundation [Puget Sound Lost Crab Pot Prevention Plan](#).

It is important to note that listing leads and partners for actions in this plan does not limit other organizations from becoming involved in an action, and as this plan evolves, there will be more opportunities for new partners to participate in these efforts.



Goal 1: Prevention

Prevent the generation of marine debris through coordinated actions that include community engagement, policy changes, best management practices, and incentive programs.

A child answers marine debris questions at an outreach event (Photo: NOAA)

| Strategy 1.1: Change individual behavior through community engagement and public education | |
|---|---|
| Current/Ongoing Actions | |
| Actions | Lead and Partners |
| 1.1.1. Conduct outreach and education around prevention of marine debris through public presentations, traveling exhibits, volunteer outreach, citizen science trainings, University courses, waste prevention and recycling initiatives, and hands-on beach cleanups | CoastSavers, COASST, Lions Clubs International, Northwest Straits Foundation, OCNMS, Pacific Shellfish Institute, PCSGA, Puget Soundkeeper, Salish Sea Expeditions, Sound Water Stewards, UW Tacoma, University of Puget Sound/Oikonos, USFWS, Zero Waste Washington, Environment WA, WashPIRG, Surfrider Foundation, Washington Environmental Council, Port Gamble S'Klallam Tribe, WDNR Aquatic Reserves, NPS, Padilla Bay NERR, NOAA MDP |
| 1.1.2. Implement a curriculum for 4th - 8th grade students: Beach Sweepers - Keeping Debris Out of the Sea | Pacific Shellfish Institute |
| 1.1.3. Implement the Marine Debris Educator Toolkit within existing outreach curriculum | Stillaguamish Tribe of Indians |

Strategy 1.1: Change individual behavior through community engagement and public education

Current/Ongoing Actions

| Actions | Lead and Partners |
|---|--|
| 1.1.4. Support educational display/program development at the Padilla Bay NERR, which includes marine debris prevention topics | Padilla Bay NERR, NOAA MDP |
| 1.1.5. Use websites, social media, blogs, and e-newsletters to educate a broad audience/general public on marine debris science, issues, and actions that can be taken to prevent marine debris | NOAA MDP, CoastSavers, COASST, UW Tacoma, Oikonos, Puget Sound Partnership, Ikkatsu Project, Puget Soundkeeper, Sound Water Stewards, WashPIRG, Environment WA, Surfrider Foundation, Washington Environmental Council, Zero Waste Washington, Lions Clubs International, OCNMS, WDNR Aquatic Reserve, NPS |
| 1.1.6. Distribute outreach materials through program volunteers, to local communities and curious beachgoers who have observed monitoring activities | COASST, WDNR Aquatic Reserve, Lower Columbia Estuary Partnership, MRCs, NPS |
| 1.1.7. Conduct on-scene outreach with landowners and the public during marine debris removal activities | WDNR, Samish Indian Nation |
| 1.1.8. Give public presentations of marine debris and creosote piling removal at regional and international conferences | Samish Indian Nation, NPS |
| 1.1.9. Conduct public education on how to prevent losing crab and shrimp traps through the Puget Sound Plan, an online instructional video, direct contact with public at access points, and during trap processing | WDFW, Northwest Straits Foundation, MRCs |
| 1.1.10. Share widely the ESRI ArcGIS Story Map titled "Marine Debris Cleanup in Samish Traditional Territory" as a public education effort | Samish Indian Nation, WDNR |
| 1.1.11. Provide training to volunteers and members of the public through several training programs to help create a sustainable Puget Sound | Sound Water Stewards |
| 1.1.12. Provide geographically tailored marine debris source and prevention messaging to community partners | Zero Waste Washington |
| 1.1.13. Implement watershed education and stewardship programs, including education and training for beach monitoring and cleanups | Washington Sea Grant, UW Tacoma, Nisqually Tribe Environmental Team, Zero Waste Washington, Ikkatsu Project, CoastSavers, Puget Soundkeeper, Lower Columbia Estuary Partnership, OCNMS, EPA (contributing member via funding) |

Strategy 1.1: Change individual behavior through community engagement and public education

Current/Ongoing Actions

| Actions | Lead and Partners |
|--|-------------------|
| 1.1.14. Continue working with property owners and State-Owned Aquatic Lands Lessees in ways that eliminate and reduce the presence of derelict over-water structures throughout Salish Sea, including the Dickman Mill, High-Tide Seafood , and other shoreline restoration and removal projects | WDNR |

Future Actions

| Actions | Lead and Partners |
|---|--|
| 1.1.15. Develop and update existing (NOAA and others) statewide environmental education curriculums on marine debris (K-12) | Pacific Shellfish Institute, UW Tacoma |
| 1.1.16. Create unified messaging and defined terms based on litter data | Zero Waste Washington |
| 1.1.17. Create a fireworks community-based task force in impacted coastal and inland communities | Surfrider Foundation, GrassRoots Garbage Gang, University of Puget Sound/Oikonos, Puget Sound Partnership |
| 1.1.18. Host a summit on marine debris education for marine debris, waste prevention, recycling and environmental educators, promote new marine debris education sessions at existing conferences, and potentially create a new conference/webinar series for educators on marine debris. Include the broader network of waste prevention, recycling and environmental educators, where applicable, as key educational stakeholders | OCNMS, CoastSavers, Lions Clubs International, NOAA MDP |
| 1.1.19. Develop an outreach toolkit related to preventing marine debris from non-food sources of expanded polystyrene (EPS) foam products, such as marine floats and buoys, coolers, and packing containers | WDNR |
| 1.1.20. Encourage behavior change via tap water promotional campaigns, including installation of water refilling stations, receptacles, and other physical infrastructure targeted at preventing marine debris | Zero Waste Washington, EPA |
| 1.1.21. Raise awareness of alternatives to single-use plastic and promote reduction | Seattle Aquarium, Zero Waste Washington, Seattle Public Utilities, Surfrider Foundation, Puget Soundkeeper, Sound Water Stewards |
| 1.1.22. Add a non-plastic bag or other collection receptacle with fireworks sales to encourage collection of debris | Surfrider Foundation, Port Gamble S’Klallam Tribe |

Strategy 1.1: Change individual behavior through community engagement and public education

Future Actions

| Actions | Lead and Partners |
|---|--|
| 1.1.23. Conduct targeted marine debris prevention outreach to marinas, yacht clubs, boaters, and ports | Washington Sea Grant, MRCs, Puget Soundkeeper, Lower Columbia Estuary Partnership |
| 1.1.24. Increase public involvement in plastic reduction campaigns | Surfrider Foundation, Zero Waste Washington, Puget Soundkeeper, Washington Environmental Council |
| 1.1.25. Raise awareness of microplastics and microfibers from clothing and textiles in wastewater | Zero Waste Washington, Puget Soundkeeper, UW Tacoma, University of Puget Sound |
| 1.1.26. Assess effectiveness of outreach tools, including ESRI Story Maps, pamphlets, websites, and curricula | Samish Indian Nation |

Strategy 1.2: Develop and promote local and strategic public policies that enhance marine debris prevention

Current/Ongoing Actions

| Actions | Lead and Partners |
|---|---|
| 1.2.1. Collaborate with tribes on tribal guidelines to prevent derelict crab pot accumulation and implement marine debris outreach and education policy on the Washington Coast | The Nature Conservancy, Quinalt Indian Nation |
| 1.2.2. Implement single-use plastic reduction policy initiatives focused on products such as EPS and other take-out containers, cutlery, cups, bags, straws, bottles, etc. | Surfrider Foundation, Zero Waste Washington, Environment WA, Seattle Public Utilities |
| 1.2.3. Expand on the crab pot escapement study, using existing research to influence policy change [†] | Northwest Straits Foundation |

Future Actions

| Actions | Lead and Partners |
|--|---|
| 1.2.4. Coordinate support for legislation related to marine debris prevention with marine debris practitioners (e.g. joint letters of support) | Zero Waste Washington, Environment WA, WashPIRG, Washington Environmental Council |
| 1.2.5. Build public support for a state-wide “bring your own bag” bill in Washington and other waste prevention legislation | Surfrider Foundation, Zero Waste Washington, Environment WA, WashPIRG, Washington Environmental Council |

Strategy 1.2: Develop and promote local and strategic public policies that enhance marine debris prevention

Future Actions

| Actions | Lead and Partners |
|--|---|
| 1.2.6. Develop and distribute white papers to support legislative action, such as funding Washington State RCW 79.145 Marine Plastic Debris | Zero Waste Washington |
| 1.2.7. Explore low-cost methods to mark and track the position of static fishing gear and marine debris, in order to locate it if it moves from its deployed position | WDNR, Quinault Indian Nation |
| 1.2.8. Explore feasibility of implementing requirements for recreational fishing gear, including marking of nets on float lines, pots, and lead lines in order to identify the owner should the gear become lost | WDFW |
| 1.2.9. Develop policies that reduce/eliminate fireworks entering the marine environment | Surfrider Foundation, Zero Waste Washington, Washington Environmental Council |
| 1.2.10. Revive existing Washington State RCW 79.145 Marine Plastic Debris | Zero Waste Washington, Surfrider Foundation, Washington Environmental Council |
| 1.2.11. Explore the potential to improve Washington State litter law RCW 79.145 Marine Plastic Debris to better address marine debris and ensure funds can be used for marine debris | Zero Waste Washington, Washington Environmental Council |

Strategy 1.3: Engage the producers and end-users (commercial/industrial) of high-priority debris sources in developing and adopting best management practices, and encourage business innovation to prevent their products from becoming marine debris

Current/Ongoing Actions

| Actions | Lead and Partners |
|--|--|
| 1.3.1. Conduct outreach and education to user groups about derelict fishing gear in Puget Sound | Northwest Straits Foundation, Stillaguamish Tribe of Indians, Skagit MRC |
| 1.3.2. Encourage reporting of newly lost fishing nets through the Puget Sound Newly Lost Net Reporting, Response, and Retrieval Program | Northwest Straits Foundation, Natural Resources Consultants |
| 1.3.3. Conduct outreach and communication to commercial shellfish growers throughout the state on the types of gear that are escaping from farms into marine systems and are found in beach cleanup data | PCSGA, WSG |

Strategy 1.3: Engage the producers and end-users (commercial/industrial) of high-priority debris sources in developing and adopting best management practices, and encourage business innovation to prevent their products from becoming marine debris

Current/Ongoing Actions

| Actions | Lead and Partners |
|--|---|
| 1.3.4. Develop changes to Environmental Best Practices and provide technical assistance for the shellfish aquaculture industry to prevent aquaculture gear from becoming marine debris | Washington Sea Grant, Willapa Grays Harbor Oyster Growers Association, Pacific Shellfish Institute, PCSGA |
| 1.3.5. Broker lane agreements between crabbers and towboat operators in order to reduce conflicts that otherwise result in derelict fishing gear and ship repairs | Washington Sea Grant, Oregon Fishermen's Cable Committee |

Future Actions

| Actions | Lead and Partners |
|---|--|
| 1.3.6. Develop shared business commitments (e.g. Strawless in Seattle campaign) and reach out to restaurants and green sports alliances to establish new ideas related to single-use plastics in to-go orders, EPS containers, and coffee cups | Seattle Aquarium, Zero Waste Washington, Environment WA |
| 1.3.7. Engage fireworks sellers collectively to influence manufacturers and consumers to actively clean up and prevent fireworks debris | Coastal MRCs |
| 1.3.8. Investigate the feasibility of developing tow lanes in the Puget Sound to reduce gear losses and build upon lessons learned on the Washington coast [†] | Washington Sea Grant, Oregon Fishermen's Cable Committee |
| 1.3.9. Develop extended producer responsibility policy approaches, including end-of-life management and ensured recyclability, for key materials of concerns, such as single-use plastics, fireworks, cigarette butts, plastic fishing gear, and other products | NW Product Stewardship Council, Zero Waste Washington, Natural Resources Consultants, Washington Environmental Council |

Strategy 1.4: Identify, create, and promote marine debris reduction incentives for individuals and businesses

Current/Ongoing Actions

| Actions | Lead and Partners |
|---|--------------------------|
| 1.4.1. Carry out education, business outreach, and change in business operations, as well as those of contractors in National Parks | NPS |
| 1.4.2. Promote participation and registration in the Ocean Friendly Restaurant program | Surfrider Foundation |

Strategy 1.4: Identify, create, and promote marine debris reduction incentives for individuals and businesses

Future Actions

| Actions | Lead and Partners |
|---|--------------------------|
| 1.4.3. Approach firework retailers with potential incentive ideas | Surfrider Foundation |



Goal 2: Removal

Locate, identify, remove, and recycle or dispose of land- and ocean-based marine debris from Washington’s shorelines and waters.

Derelict net removal in the Puget Sound (Photo: NOAA)

Strategy 2.1: Support and increase response and disposal capacity to remove marine debris in Washington

Current/Ongoing Actions

| Actions | Lead and Partners |
|---|--|
| 2.1.1. Provide cleanup supplies and dumpsters during the Independence Day holiday at State Park beach access points | CoastSavers, GrassRoots Garbage Gang, Lions Clubs International, Surfrider Foundation |
| 2.1.2. Coordinate and conduct large and small cleanups throughout Washington, including the Puget Sound, the Strait of Juan de Fuca, the Pacific Coast and the Columbia River Estuary; mobilize volunteers; and track and share results | CoastSavers, COASST, PCSGA, Friends of Camano Island Parks, GrassRoots Garbage Gang, Lions Clubs International, MRCs, Pacific Shellfish Institute, USFWS, Samish Indian Nation, Sound Water Stewards, Quinault Indian Nation, Stillaguamish Tribe of Indians, Suquamish Tribe, Port Gamble S’Klallam Tribe, Surfrider Foundation, Zero Waste Washington, Washington State Parks, Whidbey Camano Land Trust, Lower Columbia Estuary Partnership, WDNR Aquatic Reserve |

Strategy 2.1: Support and increase response and disposal capacity to remove marine debris in Washington

Current/Ongoing Actions

| Actions | Lead and Partners |
|---|--|
| 2.1.3. Train and support volunteers to survey and collect marine debris on local beaches, and report large and/or hazardous waste to appropriate authorities | COASST, UW Tacoma, University of Puget Sound, OCNMS, Ikkatsu Project |
| 2.1.4. Remove creosote-treated wood and other diffuse creosote waste, including rogue pilings and construction waste, from state-owned aquatic land and other beaches | WDNR , Samish Indian Nation, Suquamish Tribe, EPA |

Future Actions

| Actions | Lead and Partners |
|---|---|
| 2.1.5. Review and revise the Washington Marine Debris Coordination Plan, including the point of contact and hotlines for reporting marine debris of concern | NOAA MDP , WDNR, Washington Department of Ecology, Washington State Parks, PCSGA |
| 2.1.6. Develop removal and safety best management practices for both public and private debris removal efforts that minimize adverse environmental, health, and cultural effects and mitigate impacts to coastal economies. Work with disposal companies to install proper disposal sites and ensure collected marine debris is appropriately managed | CoastSavers, PCSGA, Surfrider Foundation, WDNR |
| 2.1.7. Develop cleanup protocols for wilderness and remote beaches | CoastSavers, WDNR, USFWS, Ikkatsu Project, Lower Columbia Estuary Partnership |
| 2.1.8. Develop an Adopt-A- Beach Program and Adopt –A-River Program in Washington | CoastSavers, Washington Department of Ecology, Surfrider Foundation |
| 2.1.9. Explore opportunities to work with Washington State Corrections to expand cleanup efforts | Washington Department of Ecology , WDNR |
| 2.1.10. Work with private tideland owners, homeowners associations, and other privately held and ecologically sensitive shorelines to remove creosote-treated wood that has washed up on beaches and in tidelands | WDNR |
| 2.1.11. Establish pilot projects for marine debris collection sites at public beaches (e.g. wooden box with bags inside, information about marine debris inside, provide collection and drop off location) | CoastSavers, WDNR (state-owned aquatic lands) |
| 2.1.12. Explore means to reduce contributions of cleanup debris to landfills | CoastSavers |

Strategy 2.2: Locate, document, and remove abandoned, lost or otherwise discarded (ALD) fishing gear

Current/Ongoing Actions

| Actions | Lead and Partners |
|---|---|
| 2.2.1. Coordinate and support derelict fishing gear survey and removal, including crab pots, lines, and fishing nets, in high-density areas along the Pacific Coast, Lower Columbia River, and the Puget Sound [†] | Natural Resources Consultants, Northwest Straits Foundation, Stillaguamish Tribe of Indians, Nisqually Tribe - Natural Resources Dept. - Marine Services Division, The Nature Conservancy, Quileute Tribe, Quinault Indian Nation, Lower Columbia Estuary Partnership |
| 2.2.2. Manage the Puget Sound newly lost net Reporting, Response, and Retrieval Program, and remove newly lost nets reported to the Program | Natural Resources Consultants, Northwest Straits Foundation, WDFW |
| 2.2.3. Remove deep water (beyond 105 feet deep) derelict nets in the Puget Sound | Natural Resources Consultants, WDNR |
| 2.2.4. Through enforcement sweeps, remove lost or illegal crab and shrimp traps with buoys on the surface when fisheries are closed [†] | WDFW |

Future Actions

| Actions | Lead and Partners |
|--|---|
| 2.2.5. Promote owner accountability and reporting of ALD fishing gear | WDFW, Natural Resources Consultants |
| 2.2.6. Explore coordination of current reporting systems for the WDFW lost crab and shrimp fishing gear reporting tool and the Northwest Straits Foundation reporting system | WDFW, Northwest Straits Foundation |
| 2.2.7. Further develop and identify routine funding to support tribal programs for the removal of crab pots | Quileute Tribe, Quinault Indian Nation, Nisqually Tribe Environmental Team, Port Gamble S’Klallam Tribe |
| 2.2.8. Explore development of a volunteer ALD crab and shrimp pot removal program and associated training program | Natural Resources Consultants |
| 2.2.9. Promote the use of line cutters on the outer coast in appropriate circumstances for pots embedded in the sediment | Natural Resources Consultants, Quinault Indian Nation |

Strategy 2.3: Implement a network of collection/storage sites for marine debris that can be traced to an owner and derelict gear that cannot be traced to an owner

Current/Ongoing Actions

| Actions | Lead and Partners |
|---|--------------------------|
| 2.3.1. Identify staff to coordinate holding and dispersing of recovered gear to respective stakeholders | WDFW |

Future Actions

| Actions | Lead and Partners |
|---|------------------------------|
| 2.3.2. Secure holding sites accessible to enforcement groups and meet needs by region | WDFW, Quinault Indian Nation |

Strategy 2.4: Prevent, inventory, and remove derelict vessels

Current/Ongoing Actions

| Actions | Lead and Partners |
|---|--------------------------------------|
| 2.4.1. Remove abandoned derelict vessels (ADVs) from Port Neah Bay marinas and private lands, and conduct outreach to prevent future ADVs on tribal and non-tribal land | Makah Tribe |
| 2.4.2. Continue removal of derelict vessels on WDNR priority list | WDNR Derelict Vessel Removal Program |

Future Actions

| Actions | Lead and Partners |
|--|--|
| 2.4.3. Compile a clear set of existing responsibilities and capabilities for agencies addressing derelict vessels and share publicly | WDNR Derelict Vessel Removal Program, NOAA MDP |
| 2.4.4. Promote owner Vessel Turn-In Program and encourage donations | WDNR Derelict Vessel Removal Program |
| 2.4.5. Increase reporting of ADVs to include in WDNR database | WDNR Derelict Vessel Removal Program |
| 2.4.6. Explore additional funds for derelict vessel removal | WDNR Derelict Vessel Removal Program |
| 2.4.7. Explore methods to integrate tribes for eligibility within WDNR derelict vessel removal program | WDNR Derelict Vessel Removal Program |
| 2.4.8. Support collaboration of derelict vessel removals with authorized public entities and tribes | WDNR Derelict Vessel Removal Program, Lower Columbia Estuary Partnership |

Strategy 2.5: Encourage industry responsibility to address marine debris resulting from industry activities

Current/Ongoing Actions

| Actions | Lead and Partners |
|---|--------------------------|
| 2.5.1. Continue support for use of the derelict shellfish gear removal portion of the recreational crab endorsement fee for recreational crab pot removal | WDFW |

Future Actions

| Actions | Lead and Partners |
|---|--|
| 2.5.2. Continue to promote responsible aquaculture farming through cleanups, retrieval of lost gear, and implementation of best practices | PCSGA, Pacific Shellfish Institute, Washington Sea Grant |

Strategy 2.6: Encourage commercial and recreational boaters to report and/or remove floating marine debris

Current/Ongoing Actions

| Actions | Lead and Partners |
|---|------------------------------|
| 2.6.1. Continue to promote reporting of lost fishing nets through the Puget Sound Newly Lost Net Reporting, Response, and Retrieval Program | Northwest Straits Foundation |

Future Actions

| Actions | Lead and Partners |
|---|--|
| 2.6.2. Compile and develop guidance and/or tools for boaters on how to report, remove, and dispose of marine debris | WDNR, MRCs, Northwest Straits Commission |
| 2.6.3. Educate boaters on marine debris removal | MRCs, Puget Soundkeeper |

Strategy 2.7: Remove relic tire reef installations

Future Actions

| Actions | Lead and Partners |
|---|--|
| 2.7.1. Identify and confirm locations of tire reefs, explore feasibility of tire reef removal (including habitat replacement), and remove highest priority tire reefs | Natural Resources Consultants, WDFW, WDNR, Washington Department of Ecology |
| 2.7.2. Coordinate with tribes and learn from the experience of the Nisqually Tribe's tire reef removal activities | WDNR, WDFW, Washington Department of Ecology, Natural Resources Consultants |
| 2.7.3. Explore using the state tire fund to support tire reef removal | WDNR, WDFW, Washington Department of Ecology, Natural Resources Consultants, Zero Waste Washington, Washington Environmental Council |

Strategy 2.8: Revise statutes and legislation to facilitate increased marine debris removal

Current/Ongoing Actions

| Actions | Lead and Partners |
|---|-------------------|
| 2.8.1. Engage recreational and commercial fishers to increase compliance with current rules to minimize loss of crab pots | WDFW |

Future Actions

| Actions | Lead and Partners |
|--|--|
| 2.8.2. Modify Junk Vehicle Affidavit on private property to allow derelict vessel removal by owners | WDNR Derelict Vessel Removal Program |
| 2.8.3. Combine report of sale with bill of sale for the transfer of vessel ownership | WDNR Derelict Vessel Removal Program |
| 2.8.4. Encourage WDOL to keep records on vessels and vehicles until destroyed (currently records are maintained for 6 years) | WDNR Derelict Vessel Removal Program |
| 2.8.5. Improve ability to delegate the authority to remove ALD crab pots with buoys attached on off fishing days [†] | Natural Resources Consultants |
| 2.8.6. Improve state and tribal fishing net identification | WDFW |
| 2.8.7. Explore options for better incentives/disincentives to improve compliance with fishing regulations, including increased penalties for not reporting lost fishing nets | WDFW, Washington Environmental Council |

Strategy 2.8: Revise statutes and legislation to facilitate increased marine debris removal

Future Actions

| Actions | Lead and Partners |
|--|--------------------------|
| 2.8.8. Explore options to improve the required crab pot configuration, including changes to crab pot weight, reduction in rot cord diameter, and elimination of surface floating line [†] | WDFW |
| 2.8.9. Explore the idea of a one-time mandatory online course for recreational crabbers [†] | WDFW |



Goal 3: Research

Conduct coordinated, high-quality research to inform actions that reduce the adverse impacts of marine debris.

Microplastic collection in the Puget Sound. (Photo: NOAA)

Strategy 3.1: Advance the understanding of marine debris: physical and chemical traits, full life cycle, transport, quantity, and accumulation rate

Current/Ongoing Actions

| Actions | Lead and Partners |
|--|---|
| 3.1.1. Continue GPS surveys of the San Juan Islands for marine debris and creosote before the summer removal season to increase the efficiency of removal | WDNR , Samish Indian Nation, UW Tacoma |
| 3.1.2. Conduct monthly shoreline surveys at two locations in the Dungeness National Wildlife Refuge | USFWS |
| 3.1.3. Continue studying the concentration of microplastics in beach sediment surrounding Puget Sound, Hood Canal, Green-Duwamish River system, and the Dungeness National Wildlife Refuge | Puget Soundkeeper, Salish Sea Expeditions, University of Puget Sound, USFWS |
| 3.1.4. Conduct derelict crab pot and beach use surveys through internships | Lower Columbia Estuary Partnership |
| 3.1.5. Encourage volunteers to complete and submit debris data cards or use the Ocean Conservancy's app, CleanSwell, to record their findings during beach cleanups | CoastSavers, UW Tacoma, NPS |
| 3.1.6. Conduct aerial and boat surveys to identify lost pot concentrations, and locate crab pots in the water after the end of the crab fishing season | The Nature Conservancy, Quileute Tribe, Quinault Indian Nation, Port Gamble S'Klallam Tribe |

Strategy 3.1: Advance the understanding of marine debris: physical and chemical traits, full life cycle, transport, quantity, and accumulation rate

Current/Ongoing Actions

| Actions | Lead and Partners |
|--|--|
| 3.1.7. Coordinate and provide support to litter assessments (using EPA's draft protocol) at cleanups by local volunteer organizations throughout the state, including training volunteers, assisting with data compilation into a new database, seeking feedback, and creating a baseline report | EPA Trash Free Waters program, Zero Waste Washington |
| 3.1.8. Run a citizen science program that engages participants in monthly beach surveys of marine debris 2.5mm and larger. Assessments target quantity, environmental threats, and source indicators | COASST, Quinault Indian Nation |
| 3.1.9. Conduct monthly shoreline surveys at 6 locations on the outer coast and 6 on the Strait of Juan de Fuca | OCNMS, NOAA MDP |

Future Actions

| Actions | Lead and Partners |
|--|--|
| 3.1.10. Identify relationships between polymer type and debris behavior (e.g. transport) | University of Puget Sound, UW Tacoma |
| 3.1.11. Investigate the distribution of microplastics throughout the water column and sediments | EPA, University of Puget Sound, UW Tacoma, Seattle Aquarium, Pacific Shellfish Institute, Ikkatsu Project, Puget Soundkeeper |
| 3.1.12. Compile existing data to track identifiable debris and determine location and drift patterns, including: <ul style="list-style-type: none"> • Risk assessment model to inform where to focus our resources (Bayesian network relative risk assessment model) • Marine debris deposition rate studies on selected beaches | Samish Indian Nation, WDNR, EPA, COASST, UW Tacoma |
| 3.1.13. Identify patterns of deposition by analyzing existing monitoring data, including an analysis of citizen science data. Integrate patterns with ocean circulation models | UW Tacoma, COASST |
| 3.1.14. Study the breakdown of plastics into secondary microplastics (timelines, etc.) | UW Tacoma |
| 3.1.15. Determine the contribution of consumer products, agriculture, waste management practices (including wastewater treatment and biosolids) to microplastic distribution and concentration | EPA, Vancouver Aquarium/OceanWise, Washington Department of Ecology, Zero Waste Washington, UW Tacoma |
| 3.1.16. Identify patterns of sources by analyzing existing monitoring data, including analysis of citizen-collected data. Integrate with ocean circulation models | COASST, UW Tacoma, Zero Waste Washington |

Strategy 3.1: Advance the understanding of marine debris: physical and chemical traits, full life cycle, transport, quantity, and accumulation rate

Future Actions

| Actions | Lead and Partners |
|--|--|
| 3.1.17. Document reaccumulation rates of newly lost fishing nets | Natural Resources Consultants, WDNR, UW Tacoma |
| 3.1.18. Build capacity to analyze marine debris citizen science data | Zero Waste Washington, WDNR |
| 3.1.19. Bring marine debris monitoring entities together to map data for comparability and encourage coordination prior to standardizing methods | COASST, Zero Waste Washington, University of Puget Sound, Lower Columbia Estuary Partnership, NOAA MDP, EPA, Samish Indian Nation, OCNMS |

Strategy 3.2: Improve data collection and analysis methods through standardization

Current/Ongoing Actions

| Actions | Lead and Partners |
|--|--|
| 3.2.1. Develop several methods for assessing macro- and microplastics, including standard laboratory procedures for microplastics extraction, and identification and inventory in various matrices such as sediments and biosolids | EPA Trash Free Waters program and Office of Research and Development, Zero Waste Washington, UW Tacoma |
| 3.2.2. Use a marine debris survey protocol focusing on diffuse creosote and treated wood to determine highest concentrations and assess repopulation intervals | Samish Indian Nation, UW Tacoma |
| 3.2.3. Develop and implement citizen science marine debris survey methods that result in compatible and comparable data | COASST, NOAA MDP, UW Tacoma, Zero Waste Washington |
| 3.2.4. Continue debris loading and marine debris type monitoring/assessment by OCNMS volunteers | COASST, NOAA MDP, OCNMS, UW Tacoma |

Future Actions

| Actions | Lead and Partners |
|--|---|
| 3.2.5. Standardize lab protocols for microplastic concentrations in sediment, water, invertebrates, etc. (<400 microns) | EPA, UW Tacoma, University of Puget Sound, Seattle Aquarium |
| 3.2.6. Cross-communicate about standard protocols, potentially through a workshop to generate standardization/harmonization frameworks | WDNR, NOAA MDP, University of Puget Sound |
| 3.2.7. Develop standard microplastic and nanoplastic toxicity tests in ecologically relevant organisms and systems | University of Puget Sound, Seattle Aquarium |

Strategy 3.3: Research the ecological, human health, economic, and cultural impacts of marine debris

Current/Ongoing Actions

| Actions | Lead and Partners |
|--|--|
| 3.3.1. Support surveys that identify the characteristics of debris fragments, and their impact on birds and other wildlife | COASST, Zero Waste Washington |
| 3.3.2. Conduct marine debris impacts studies to support the Rise Above Plastics campaign | Surfrider Foundation, University of Puget Sound |
| 3.3.3. Update annually the models reported in 2011 to estimate crab pot loss, number of crabs killed, and the value of crabs killed in derelict pots in Puget Sound | Natural Resources Consultants, Northwest Straits Foundation |
| 3.3.4. Conduct annual survey and removal operations in the Port Gardner study area to study behavior regarding escape cord use, pot loss rates, and reasons for pot loss | Natural Resources Consultants, Northwest Straits Foundation, Snohomish MRC |
| 3.3.5. Investigate potential impacts to juvenile rockfish from derelict shrimp pots | Natural Resources Consultants, Northwest Straits Foundation |
| 3.3.6. Use survey results to continue threat/risk assessments for seabirds and other wildlife | COASST, University of Puget Sound |
| 3.3.7. Monitor the physical and biological changes occurring as a result of the Doe Kag Wats estuary creosote wood removal restoration project | Suquamish Tribe |
| 3.3.8. Conduct research to support water quality standards for microplastics including human health and food web implications | Seattle Aquarium |

Future Actions

| Actions | Lead and Partners |
|---|---|
| 3.3.9. Research bioaccumulation and biomagnification of plastics | Seattle Aquarium, University of Puget Sound |
| 3.3.10. Conduct research/literature review to identify which types of marine debris are the most damaging to wildlife | COASST, UW Tacoma |

Strategy 3.4: Research product design and technologies related to marine debris

Current/Ongoing Actions

| Actions | Lead and Partners |
|--|---|
| 3.4.1. Continue study of the characteristics of lost/closed season recreational crab gear in Puget Sound including buoy arrangement, added weights, line type, etc. to potentially identify features which contribute to gear loss | WDFW |
| 3.4.2. Identify the most effective commercial crab pot configuration and style of disabling mechanisms that allow crabs to escape pots after the pot is disabled | Natural Resources Consultants, Northwest Straits Foundation |

Future Actions

| Actions | Lead and Partners |
|--|---|
| 3.4.3. Research efficacy of existing Navy and other protocols to standardize plastics formulas for re-use or fuel conversion | Lions Clubs International |
| 3.4.4. Assess Washington State's contribution to global marine debris, including end-of-life options and practices for existing plastic (e.g. recycling). Consider the impacts of shipping and the contribution to plastic pollution in other countries, domestic vs. overseas processing, and recycling vs. downcycling | Lions Clubs International, Zero Waste Washington, Puget Soundkeeper |
| 3.4.5. Explore fishing gear marking protocols (e.g. barcoding) | Natural Resources Consultants, Lions Clubs International |
| 3.4.6. Research escapement rates with commercial style crab gear to determine pot styles that allow optimal escape to minimize wildlife impacts | Natural Resources Consultants |
| 3.4.7. Research the proper amount of weight needed for crab/shrimp pots to minimize lost pots | Northwest Straits Foundation |
| 3.4.8. Evaluate innovations in consumer materials that tend to become marine debris and products to increase recyclability, reduce environmental impacts, and prevent introduction | Lions Clubs International |

Strategy 3.5: Conduct social science research related to marine debris

Future Actions

| Actions | Lead and Partners |
|---|----------------------------------|
| 3.5.1. Conduct social science research to determine public understanding and perspective of marine debris issues and their impacts, and identify motivators, barriers, and what the most effective outreach strategies are for reducing marine debris | Zero Waste Washington |
| 3.5.2. Research the efficacy of tax incentives for businesses to implement the use of plastic alternatives and/or producer or retailer take-back schemes | Washington Environmental Council |



Volunteers pose with bags of debris (Photo: CoastSavers)

Goal 4: Coordination

Coordinate marine debris actions effectively throughout Washington State.

Strategy 4.1: Create better communication and collaboration with local, regional, federal, tribal, and international stakeholders

Current/Ongoing Actions

| Actions | Lead and Partners |
|---|---|
| 4.1.1. Implement the actions identified in the Puget Sound Lost Crab Pot Prevention Plan | Northwest Straits Foundation |
| 4.1.2. Conduct a multi-agency mammal entanglement training at levels 1 and 2 for the Quileute, Quinault, and Hoh Tribes | The Nature Conservancy |
| 4.1.3. Coordination with partners to reduce single-use plastic items | Seattle Aquarium, Zero Waste Washington, Puget Soundkeeper |
| 4.1.4. Continue promotion of the Pacific Basin Cleanup, an effort to inspire and coordinate Lions around the Pacific Basin to conduct cleanups and share information | Lions Clubs International |
| 4.1.5. Coordinate with local non-profit organizations to support shoreline cleanups and to submit cleanup data to Ocean Conservancy | Pacific Shellfish Institute, Lower Columbia Estuary Partnership |
| 4.1.6. Coordinate with teachers to perform outreach, education related to marine debris, and campus cleanups | Pacific Shellfish Institute, Zero Waste Washington |
| 4.1.7. Coordinate with the Washington Conservation Corps crew on creosote logs and marine debris removal, as well as with the USCG to assist with post-cleanup removal of marine debris on Destruction Island | Washington Department of Ecology, USFWS |

Strategy 4.1: Create better communication and collaboration with local, regional, federal, tribal, and international stakeholders

Current/Ongoing Actions

| Actions | Lead and Partners |
|---|------------------------------------|
| 4.1.8. Coordinate with the EarthCorps crew on creosote logs and marine debris removal in the San Juan Islands | WDNR , Samish Indian Nation |

Future Actions

| Actions | Lead and Partners |
|--|--|
| 4.1.9. Develop a listserv for the Washington marine debris community | Zero Waste Washington, Washington Sea Grant, Puget Sound Partnership |
| 4.1.10. Strengthen partnerships with Washington tribes to explore the impacts of marine debris on tribal communities and cultural activities, and share information and resources | Nisqually Tribe Environmental Team , CoastSavers, NOAA MDP, Samish Indian Nation, Stillaguamish Tribe of Indians, Surfrider Foundation, WDNR, Zero Waste Washington, Puget Sound Partnership, EPA, Northwest Straits Commission, Washington State Parks |
| 4.1.11. Formalize local, regional and statewide partnerships among local municipalities, counties, parks, private citizens, public lands, tribes, non-profits, and others to reduce marine debris more effectively | CoastSavers, PCSGA, WDNR, Zero Waste Washington, Puget Sound Partnership, Northwest Straits Commission, Surfrider Foundation, Samish Indian Nation, Lower Columbia Estuary Partnership, Lions Clubs International |
| 4.1.12. Identify stakeholders that have a desire and/or need for increased communication on marine debris | NOAA MDP , CoastSavers, Washington State Parks, Zero Waste Washington, Puget Sound Partnership, Washington Environmental Council, EPA |
| 4.1.13. Expand relationships with federal agencies, including the Department of Defense, to collaborate on marine debris issues and projects | WDNR, Puget Sound Partnership, EPA, Natural Resources Consultants, NOAA MDP |
| 4.1.14. Integrate the Washington and Oregon MDAPs, and the California Ocean Litter Prevention Strategy, with the efforts of the West Coast Marine Debris Alliance | Stillaguamish Tribe of Indians , NOAA MDP, Washington Environmental Council |

Strategy 4.2: Find long-term dedicated funding sources and other resources for implementing the Washington Marine Debris Action Plan

Current/Ongoing Actions

| Actions | Lead and Partners |
|--|--|
| 4.2.1. Fund and support various local, state, and tribal groups to aid in a variety of marine debris removal activities, including the removal of thousands of tons of creosote pilings from the shorelines of Puget Sound, Grays Harbor, Willapa, and other estuaries | EPA Puget Sound Team |
| 4.2.2. Fund local government efforts aimed at litter cleanup and prevention through the Community Litter Cleanup Grant Program | Washington Department of Ecology |
| 4.2.3. Research grants to address the sources and impacts of marine debris, and to evaluate education and citizen science approaches | Washington Sea Grant |
| 4.2.4. Explore charitable funds with solid waste management companies and other stakeholders, such as major retailers and manufacturers in Washington State | CoastSavers, WDNR, Zero Waste Washington |
| 4.2.5. Explore Near Term Actions with Puget Sound Partnership | EPA (Trash Free Waters and Puget Sound Teams), Northwest Straits Commission, WDNR, Zero Waste Washington |

Future Actions

| Actions | Lead and Partners |
|---|---|
| 4.2.6. Clarify and disseminate the potential funding process through tribal communities with charitable funds | CoastSavers, Stillaguamish Tribe of Indians, Nisqually Tribe Environmental Team |
| 4.2.7. Pursue a line item in the state budget for a marine debris prevention/removal/disposal fund, beginning with Washington State litter law RCW 79.145 Marine Plastic Debris | Surfrider Foundation, WDNR, Zero Waste Washington, Washington Environmental Council |
| 4.2.8. Advertise additional funding through federal agencies | NOAA MDP, EPA |
| 4.2.9. Include WA MDAP partners in the 2022 Puget Sound Action Agenda priority development process to create an avenue for potential near term actions | Puget Sound Partnership |

Strategy 4.3: Develop a statewide sharing platform for inventory of all marine debris data for widespread dissemination, including debris locations, removal efforts, amount removed, data-driven reporting, etc.

Current/Ongoing Actions

| Actions | Lead and Partners |
|--|--------------------------|
| 4.3.1. Working on inventory and sharing platform for land-based sources of marine debris | Zero Waste Washington |

Future Actions

| Actions | Lead and Partners |
|---|--|
| 4.3.2. Develop and promote an online marine debris data portal for resources, protocols, evidence based and vetted curriculum, uniform research, public reporting, and citizen engagement | NOAA MDP, Lower Columbia Estuary Partnership, UW Tacoma |
| 4.3.3. Develop a marine debris reporting app for large debris so that citizens may report debris such as creosote and docks that agencies may remove | WDNR, Lower Columbia Estuary Partnership, UW Tacoma |
| 4.3.4. Develop effective methods of reporting on results and accomplishments, potentially through an annual marine debris report | Stillaguamish Tribe of Indians, COASST, CoastSavers, NOAA MDP, PCSGA, Samish Indian Nation, Surfrider Foundation, WDNR, Puget Sound Partnership, Zero Waste Washington, UW Tacoma |
| 4.3.5. Ensure coordination and collaboration among researchers, and communicate results with stakeholders | COASST, UW Tacoma, Pacific Shellfish Institute, Seattle Aquarium |
| 4.3.6. Support the updating and maintenance of the Washington State Derelict Gear Database | Northwest Straits Foundation, Natural Resources Consultants |

Appendix I: Additional Actions

The actions below were suggested for inclusion in the document. They have equal merit and potential as other actions in this document, but presently have no entity listed to undertake them.

Goal 1: Prevention

Strategy 1.1:

- Establish a coordinated effort to expand, gauge efficacy, raise awareness, and effectively monitor the Monofilament Recycling and Recovery projects

Strategy 1.3:

- Develop a coordinated regional “bring your own” campaign to reduce the use of single-serve packaging and food service ware, bags, and other items.

Strategy 1.4:

- Encourage beverage industry involvement to establish partnerships or opportunities for collaboration
- Work with retailers and producers to incentivize reduced-price coffee for reusable mugs
- Develop a section of the online collaborator portal/listserv dedicated to information about incentives/opportunities that are more community-based
- Develop branded recognition programs, including a criteria checklist, a nomination committee, and recognition measures and awards (e.g. Ocean Friendly Restaurants)

Goal 2: Removal

Strategy 2.3:

- Identify waste streams for marine debris such as recycling and energy generation to create incentives for removal, including the Fishing for Energy program, and identify barriers to those waste streams

Strategy 2.4:

- Promote marine debris boater education for registration and boat owner responsibilities and tie in with the Clean Marina Initiative

Strategy 2.5:

- Explore adding a removal surcharge to commercial fishing license fees to be applied toward commercial fishing gear removal efforts

Strategy 2.6:

- Include guidance on how to report, remove, and dispose of marine debris in outreach to boat owners registering their boats
- Include guidance on how to report, remove, and dispose of marine debris in USCG boater safety checks

Strategy 2.8:

- Explore reciprocal information sharing with tribes and WDOL regarding vessel registration and ownership database

Goal 3: Research

Strategy 3.2:

- Develop standard barcode methodology for in-water equipments

Strategy 3.3:

- Assess the food web for impacts of non-plastic marine debris, including creosote, nets, etc.
- Conduct a human health risk assessment of ingested microplastic in seafood with a focus on subsistence harvests, emphasizing environmental justice
- Conduct a cost-benefit analysis of marine debris and include externalities (e.g. environmental and human health impacts) represented as costs

Strategy 3.4:

- Research alternative materials for common plastic products (e.g. straws, utensils) including biodegradables and how their use could save companies money
- Evaluate whether it is viable to recycle (not downcycle) plastic marine debris

Goal 4: Coordination

Strategy 4.1:

- Organize a Washington State marine debris conference to present research from around the entire state, including cleanup data. Consider presentations/sessions at established conferences such as Salish Sea Ecosystem Conference

Appendix II: List of Participants

List of participants who attended Washington Marine Debris Action Plan workshops.

Name underlined: WA MDAP planning team

Name in bold font: Workshop support team

| Name | Organization |
|-------------------------------|--|
| Afterbuffalo, Bernard, Jr | Hoh Tribe http://hohtribe-nsn.org/ |
| Amell, John | Sound Water Stewards https://soundwaterstewards.org/web/ |
| Antrim, Liam | Community member/Retired NOAA Olympic Coast National Marine Sanctuary |
| Barnea, Nir | NOAA Marine Debris Program https://marinedebris.noaa.gov/ |
| Biaggi, Taylor | Environmental Protection Agency https://www.epa.gov/ |
| Bogeberg, Molly | The Nature Conservancy http://www.washingtonnature.org/ |
| Boland, Brice | Surfrider Foundation https://www.surfrider.org/ |
| Bucklin, Laurence | Puget Sound Anglers State Board http://www.pugetsoundanglers.org/ |
| Burgess, Hillary | University of Washington Coastal Observation and Seabird Survey Team (COASST) https://depts.washington.edu/coasst/ |
| Butler-Minor, Chris | NOAA Olympic Coast National Marine Sanctuary https://olympiccoast.noaa.gov/ |
| Campbell, Ken | Ikkatsu Project https://www.ikkatsuproject.org/ |
| Cardinal, Kara | Washington Marine Debris Action Plan Coordinator/NOAA Contractor |
| Christiansen, Peter | Washington Department of Ecology https://ecology.wa.gov/ |
| Christy, Aimee | Pacific Shellfish Institute http://pacshell.org/ |
| Colahan, Chandler | Padilla Bay National Estuarine Research Reserve https://ecology.wa.gov/ |
| Davenport, Birdie | Washington Department of Natural Resources https://www.dnr.wa.gov/ |
| Davis, Kathryn | Puget Soundkeeper https://pugetsoundkeeper.org/ |
| Dennehy, Casey | Grays Harbor MRC http://www.co.grays-harbor.wa.us/departments/public_services/MarineResourcesCommittee/index.php |
| Drinkwin, Joan | Natural Resources Consultants https://nrccorp.com/ |
| Dye, Paul | Washington Sea Grant https://wsg.washington.edu/ |
| Eshom-Arzadon, Frances | University of Washington http://www.washington.edu/ |
| Fernandez, Joseph | Washington State Parks https://www.parks.wa.gov/ |
| Fox, Demi | NOAA Marine Debris Program/Freestone Contractor https://marinedebris.noaa.gov/ |
| Harris, Sydney | Washington Environmental Council https://wecprotects.org/ |
| Hart, Lucas | Northwest Straits Commission http://www.nwstraits.org/ |
| Hines, Eleanor | Whatcom County MRC https://www.whatcomcountymrc.org/ |
| Houle, Katie | Pacific Shellfish Institute http://pacshell.org/ |
| Jackson, Segó | Seattle Public Utilities https://www.seattle.gov/util/ |

| Name | Organization |
|---------------------------|--|
| Kehoe, Christy | NOAA Marine Debris Program/Freestone Contractor https://marinedebris.noaa.gov/ |
| King, Gordon | Jefferson County MRC https://www.jeffersonmrc.org/ |
| Laverty, Amanda | NOAA Marine Debris Program https://marinedebris.noaa.gov/ |
| Lee, Jennifer | Puget Sound Partnership www.psp.wa.gov |
| Lippiatt, Sherry | NOAA Marine Debris Program/IMSG Contractor https://marinedebris.noaa.gov/ |
| Lucia, Dennis | Nisqually Indian Tribe http://www.nisqually-nsn.gov/ |
| Mabardy, Becky | Pacific Coast Shellfish Growers Association https://pcsga.org/ |
| Marcoe, Keith | Lower Columbia Estuary Partnership www.estuarypartnership.org/ |
| Masura, Julie | University of Washington Tacoma http://www.tacoma.uw.edu/ |
| McCollum, Paul | Port Gamble S'Klallam https://www.pgst.nsn.us/ |
| Messmer, Nancy | Lions Club International http://www.lcif.org |
| <u>Morgan, Jason</u> | Northwest Straits Foundation https://nwstraitsfoundation.org/ |
| Morris, Roy | Community member/North Coast MRC https://www.jeffersoncountypublichealth.org/715/North-Pacific-Coast-Marine-Resources-Com |
| Murphy, Peter | NOAA Marine Debris Program/GenWest Contractor https://marinedebris.noaa.gov/ |
| Orlick, Elise | Washington Public Interest Research Group https://washpirg.org/home |
| Palmer-McGee, Casey | Samish Indian Nation https://www.samishtribe.nsn.us/ |
| Parrish, Julia | University of Washington Coastal Observation and Seabird Survey Team (COASST) https://depts.washington.edu/coasst/ |
| Perez, Franchesca | Stillaguamish Tribe of Indians http://www.stillaguamish.com/ |
| Pilaro Barrette, Margaret | Pacific Coast Shellfish Growers Association https://pcsga.org/ |
| Richards, Ruth | Island County MRC https://www.islandcountymrc.org/ |
| <u>Robertson, Chris</u> | Washington Department of Natural Resources, Marine Debris Removal https://www.dnr.wa.gov/ |
| Rose, Austin | Whatcom County MRC https://www.whatcomcountymrc.org/ |
| Russell, Samantha | Salish Sea Stewards http://www.skagitmrc.org/projects/education-outreach/salish-sea-stewards/ |
| <u>Schmidt, Jon</u> | Washington CoastSavers/SOLVE https://www.solveoregon.org/ |
| St Clair, Janet | Sound Water Stewards https://soundwaterstewards.org/web/ |
| Stegemann, Krista | NOAA Marine Debris Program/IMSG Contractor https://marinedebris.noaa.gov/ |
| Steinhoff, Marla | NOAA Office of Response and Restoration https://response.restoration.noaa.gov/ |
| Stepetin, David | Nisqually Indian Tribe http://www.nisqually-nsn.gov/ |
| Stokes, Chigger | North Coast MRC https://www.jeffersoncountypublichealth.org/715/North-Pacific-Coast-Marine-Resources-Com |
| Suter, Stephanie | Puget Sound Partnership www.psp.wa.gov |
| Tollefson, Kristian | Washington Department of Natural Resources https://www.dnr.wa.gov/ |

| Name | Organization |
|-----------------------|--|
| Trim, Heather | Zero Waste Washington http://www.zerowastewashington.org/ |
| <u>Velasquez, Don</u> | Washington Department of Fish and Wildlife, Derelict Fishing Gear https://wdfw.wa.gov/ |
| Walker, Heidi | Discover Your Northwest http://www.discovernw.org/ |
| Wharton, Jim | Seattle Aquarium https://www.seattleaquarium.org/ |
| Wood, Troy | Washington Department of Natural Resources https://www.dnr.wa.gov/ |
| Woodard, Todd | Samish Indian Nation https://www.samishtribe.nsn.us/ |
| Wu, Dana | Seattle Aquarium https://www.seattleaquarium.org/ |

Appendix III: Actions by Debris Type

| ADVs | Creosote Wood | Derelict Fishing Gear | Fireworks | Microplastics/ Microfibers | Shellfish Aquaculture Debris | Single-use Packaging | Tire Reefs |
|---------------|---------------|-----------------------|-----------|----------------------------|------------------------------|----------------------|---------------|
| 2.4.1.-2.4.8. | 1.1.8. | 1.1.9. | 1.1.17. | 1.1.25. | 1.3.3. | 1.1.19.-1.1.22. | 2.7.1.-2.7.3. |
| 2.8.2. | 1.1.14. | 1.2.1. | 1.1.22. | 3.1.3. | 1.3.4. | 1.2.2. | |
| 2.8.3. | 2.1.4. | 1.2.3. | 1.2.9. | 3.1.11. | 2.5.2. | 1.2.5. | |
| 2.8.4. | 2.1.10. | 1.2.7. | 1.3.7. | 3.1.14. | 4.2.3. | 1.3.6. | |
| | 3.1.1. | 1.2.8. | 1.3.9. | 3.1.15. | | 1.3.9. | |
| | 3.2.2. | 1.3.1. | 1.4.3. | 3.2.1. | | 1.4.2. | |
| | 3.3.7. | 1.3.2. | | 3.2.5. | | 4.1.3. | |
| | 4.1.7. | 1.3.5. | | 3.2.7. | | | |
| | 4.1.8. | 1.3.8. | | 3.3.8. | | | |
| | 4.2.1. | 2.2.1.-2.2.9. | | | | | |
| | 4.3.3. | 2.3.1. | | | | | |
| | | 2.3.2. | | | | | |
| | | 2.5.1. | | | | | |
| | | 2.6.1. | | | | | |
| | | 2.8.1. | | | | | |
| | | 2.8.5.-2.8.9. | | | | | |
| | | 3.1.4. | | | | | |
| | | 3.1.6. | | | | | |
| | | 3.1.17. | | | | | |
| | | 3.3.3.-3.3.5. | | | | | |
| | | 3.4.1. | | | | | |
| | | 3.4.2. | | | | | |
| | | 3.4.5.-3.4.7. | | | | | |
| | | 4.1.1. | | | | | |
| | | 4.1.2. | | | | | |
| | | 4.3.6. | | | | | |



Wilbur L. Ross, Jr.
United States Secretary of Commerce

RDML Tim Gallaudet, Ph.D., USN Ret.
Assistant Secretary of Commerce for Oceans and Atmosphere and
Acting Under Secretary of Commerce for Oceans and Atmosphere

Nicole R. LeBoeuf
Acting Assistant Administrator for Ocean Services
and Coastal Zone Management