

Marine Debris Strategy for the  
West Coast Governors Alliance on Ocean Health

7/20/2013

## **Executive Summary**

Marine debris is a global problem impacting the environment, commerce and human safety. Marine debris is generated by society in many ways, including production, manufacturing, transportation and distribution of products to sellers and buyers, careless littering and poor solid waste management, as well as loss of fishing gear (McIlgorm et al. 2011). Despite the variety of sources and the global nature of the issue, marine debris can be efficiently addressed regionally and locally.

The West Coast Governors Alliance on Ocean Health (WCGA), Marine Debris Action Coordination Team (MD ACT) has worked closely and collaboratively over the past three years to develop a Marine Debris Strategy (the Strategy); a non-prescriptive, regional framework to identify, assess, prevent, and reduce marine debris along the West Coast. This document characterizes the problem of marine debris; lays out the goals and objectives of the strategy; identifies barriers and challenges; gives suggested actions for land-based debris (LBD), derelict fishing gear (DFG), and cross-cutting issues; highlights several projects to facilitate recommended actions; and creates a timeline for deliverables to be completed.

*The goal of the Strategy is to address marine debris and its impacts effectively and in a prioritized manner by facilitating action and collaboration among California, Oregon and Washington, federal and tribal governments, academia, industry, and non-governmental organizations with an ultimate vision of zero debris entering the marine environment from land, and zero impact from debris entering the marine environment at sea.*

Recognizing the different circumstances and priorities across the West Coast region and the need for flexibility, the Strategy adopts a performance-based, non-prescriptive approach towards meeting its goals and objectives. Once target milestones are established, prevention and reduction measures to reach these milestones can be achieved through choosing identified actions that work best for the specific problem and for the enacting individual or organization and any of their partners. This approach allows individuals and entities to leverage their own resources and choose action items that suit their needs and priorities while still achieving the goal of marine debris reduction.

The Strategy aims to reduce and prevent marine debris on a broader scale through addressing various topics such as land-based debris, derelict fishing gear and cross-cutting issues across the West Coast. The Strategy's main objectives include: preventing marine debris from entering the ocean or littering beaches; maximizing recovery of marine debris in the ocean or on beaches; reducing and preventing the negative impacts of marine debris; and enhancing existing efforts through communication and collaboration among interested parties on the West Coast. To achieve these objectives, the Strategy also includes a toolbox of key actions that may be implemented collaboratively or individually on a West Coast-wide basis: assessing baseline conditions for marine debris; setting measureable targets for improvements; establishing a database to ascertain baseline marine debris quantities and activities; monitoring progress; encouraging research to identify problems and potential solutions; implementing cost-effective methods for removal; and promoting

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stewardship through education in all aspects of marine debris prevention, reduction and removal activities.

The overall objective for land-based debris (LBD) is to reduce the amount and impact of debris entering the ocean from land-based sources along the West Coast through greater reduction of material that has the potential to become marine debris, and prevention of material entering the ocean that is likely to become marine debris. Proposed recommended actions for LBD along the West Coast include: reduce and prevent the quantity of debris entering the ocean; build strong partnerships with industries; work with waste management municipalities; and support improved enforcement of existing laws that address marine debris.

The overall objective for derelict fishing gear (DFG) is to reduce the amount and impact of derelict fishing gear along the West Coast through loss prevention, gear modification to reduce impacts if fishing gear is lost, and surveys for and removal of fishing gear. Proposed recommended actions are: build strong relationships with the fishing industry, management industries and relevant maritime entities; assess the DFG locations and accumulations on the west coast and prioritize information gaps; identify and address barriers to minimize DFG and its impacts; remove DFG; and evaluate relevant policies, rules and laws beneficial or detrimental to achieving DFG goals and objectives.

Cross-cutting issues are topics that multiple entities are working on at the same time. Encouraging collaboration and fostering partnerships on these cross-cutting issues allows organizations to work towards a clear, common objective without duplicating efforts. The Strategy identifies four critical cross-cutting issues in particular: data management, research, information sharing, and education. Recommended actions for data management are creating and promoting the use of a standardized beach clean up data card for LBD, and utilizing a tri-state database. For research and information sharing, recommended actions include promoting research opportunities, and information sharing among participants. Finally, recommended actions for education include research and compile current and past educational messages and campaigns on marine debris; develop a working group that will develop effective educational messages about marine debris; create a uniform method for disseminating information; work with existing ocean education and awareness groups and organizations; and encourage community involvement through incentive programs.

The flexible approach to carrying out proposed recommended actions of the Marine Debris Strategy allows for the successful achievement of target milestones through various means. However, methods for reaching target milestones are less critical than the need for setting and achieving the targets by whatever means chosen. This strategy will also be a helpful blue print for the West Coast in promoting increased collaboration and partnerships to effectively prevent and reduce marine debris.

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## **Introduction**

In September 2006, the Governors of Oregon, Washington and California signed the West Coast Governors' Agreement on Ocean Health (WCGA), which tasked agencies of the three states to work closely with, federal partners, and additional stakeholders to develop a bold set of actions to protect and manage ocean and coastal resources along the entire West Coast. Marine debris was identified in the 2008 WCGA Action Plan under Priority Area 1: Clean Water and Beaches. Action 1.4 asserts that the three states will:

Establish baseline estimates of marine debris and derelict gear off the West Coast and set reduction goals. Support state and federal policies for achieving marine debris reduction goals, including debris prevention through expanded recycling, improved trash maintenance, and enforcement of litter laws.

Because the West Coast is part of the same large marine ecosystem and is intrinsically interconnected, a regional, multi-state partnership is beneficial for addressing marine debris. Furthermore, marine debris can have impacts that cross jurisdictional and political boundaries. The Marine Debris Action Coordination Team (MD ACT) was formed in 2008, and the Work Plan<sup>1</sup> identifies several work products including; 1) a Marine Debris Strategy, 2) a regional Marine Debris Database and, 3) West Coast Marine Debris Alliance. The MD ACT is comprised of representatives from state, federal, and tribal governments, non-governmental organizations, academia and industry. This comprehensive Marine Debris Strategy aims to identify, assess, prevent and reduce marine debris while leveraging existing resources and expertise along the West Coast. MD ACT members, invited experts and observers came together during three workshops<sup>2</sup> to discuss derelict fishing gear, land-based debris, identify gaps, and develop recommendations for the Strategy and Alliance.

## **Characterization of Problem**

### **Source**

Marine debris is a global problem impacting the environment, commerce and human safety. Marine debris is generated by society in many ways, including production, manufacturing, transportation and distribution of products to sellers and buyers, careless littering and poor solid waste management, as well as loss of fishing gear (McIlgorm et al. 2011). The main types of debris include plastics, glass, metal, polystyrene (Styrofoam), rubber, wood, derelict fishing gear, and derelict vessels (Fanshawe and Everand 2002). An estimated 60 to 80 percent of all marine debris and 90 percent of floating debris is plastic (Derraik 2002). The majority of marine debris comes from

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<sup>1</sup> The 2010 Work Plan can be found at

[http://www.westcoastoceans.org/media/Marine\\_Debris\\_Final\\_Work\\_Plan.pdf](http://www.westcoastoceans.org/media/Marine_Debris_Final_Work_Plan.pdf)

<sup>2</sup> All three workshop proceedings can be found on the WCGA MD ACT website:

<http://www.westcoastoceans.org/index.cfm?fuseaction=content.display&pageID=81>

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land, and the sources include industrial outfalls, land fill, littering, dumping, or poor waste management (Derraik 2002). Debris from ocean-based sources arises from commercial fishing, shipping and oil sectors, and from recreational boating and military vessels (Fanshawe and Everand 2002). Derelict (or abandoned) fishing gear (DFG) includes nets, lines, crab and shrimp traps/pots and other recreational and commercial harvest equipment that has been lost or abandoned in the marine environment (Washington Department of Fish and Wildlife 2011). Ocean-based debris (OBD) is debris that originates from activities that take place in the marine environment such as vessels (merchant shipping, ferries, cruise liners, fishing vessels, and recreational vessels), offshore oil and gas platforms and drilling rigs, and aquaculture installations. This type of debris also includes debris that is indistinguishable from land-based debris (e.g., plastic bottles, other types of litter) and debris that is specific to maritime activities (e.g., buoys, lines, lost cargo). Once the debris enters the Pacific Ocean, a rotating gyre system, which is part of the currents in the North Pacific, can carry floating marine debris over long distances. Over time, plastic debris breaks down into smaller and smaller pieces called micro plastics, and stays in the marine environment causing harmful impacts to the marine environment (Arthur et al. 2009).

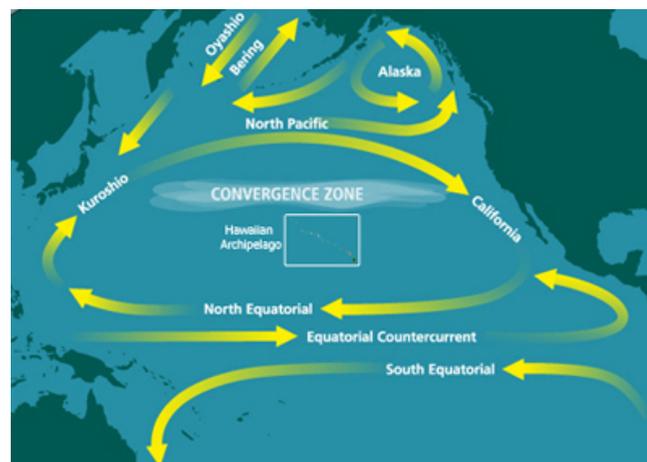


Image of North Pacific Gyre

Source: NOAA Marine Debris Program

Along the West Coast, both shoreline debris and derelict fishing gear removal have been on-going for many years. In Washington State, derelict fishing gear, especially derelict nets in the Puget Sound, has been a main focus of marine debris removal. Along the outer coast of Washington State and along the Oregon coast, derelict crab pots have been the main focus of assessment and removal. In both states, coastal cleanups have been carried out mostly by volunteers, with support and coordination of state and federal agencies. Derelict fishing gear along California's coast and especially in its four National Marine Sanctuaries has been removed in the past, and is currently being surveyed and additional removal projects are being planned. Coastal cleanups in California are conducted on a regular basis, and the California Coastal Cleanup Day, coordinated by the California Coastal Commission, is among the largest one-day marine debris cleanups in the world.

### **Amount**

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While there is no comprehensive global or regional abundance assessment of marine debris, it is estimated that worldwide, approximately 6.4 million tons of debris reaches the ocean each year and that around 8 million items are discarded into the sea every day (UNEP 2005). The Ocean Conservancy currently maintains the most comprehensive marine debris database through data from International Coastal Cleanup Day, an event that occurs internationally once a year in September. Based on the Ocean Conservancy's 2011 database, 879,096 items were picked up in the three states during Coastal Cleanup Day. California had 598 sites and the highest number of items collected at 854,496. Oregon had 85 sites with 8,911 items collected, and Washington had 14 cleanup sites with 15,689 items collected.

Regarding derelict fishing gear, Washington State has faced significant problems, especially in Puget Sound due to legacy heavy commercial fishing combined with rocky substrate and strong tidal currents. The WA Department of Fish and Wildlife estimates that 117,000 items, weighing approximately 2.6 million pounds, lay beneath the surface waters of Puget Sound and Hood Canal. Since 2002, Northwest Strait Initiative and other entities have removed thousands of derelict nets and crab pots. In Oregon, the Department of Fish and Wildlife used American Recovery and Reinvestment funding to remove over 3,000 derelict crab pots as well as tons of line, cable and buoys in 2009 and 2010. The California Lost Fishing Gear Recovery Project works collaboratively with Washington to review lessons learned to make gear removal more efficient. Since May 2006, this project has retrieved more than 45 tons of gear from California's coast.

The source and amount of marine debris varies through time. Depending on the weather and season, more or less marine debris can be observed. For example, during the rainy season, more marine debris can wash down from inland regions, while, in the summer months, higher number of beach users leave more debris on the beaches. Furthermore, there is also an increase in the number of abandoned or lost fishing gear during peak harvesting seasons.

### **Impacts**

Marine debris can have negative environmental, economic and public health impacts. Environmental impacts caused by marine debris include entanglement, trapping, ingestion, and degradation of habitat. Entanglement occurs when marine organisms get caught in DFG, such as lost fishing lines and nets. Furthermore, DFG can cause wounds, impair mobility, increase vulnerability to predators, and strangle marine organisms (U.S. Commission on Ocean Policy 2004). Marine debris also degrades marine habitat causing direct abrasion of sensitive habitat, obstruction, blocking sunlight and preventing growth of flora, and floating debris can carry and introduce non-native species altering habitats and ecosystems (Derraik 2002). Ingestion can occur accidentally or when animals mistake marine debris for their natural food. Ingesting plastics can clog the digestive systems leading to starvation, lead to injuries and infections if the object is sharp, interfere with breathing, and accumulate toxins within the animal's body leading to reproductive failure or death (Derraik 2002).

Impacts from marine debris can carry associated economic costs. For example, polluted beaches discourage tourism and beach use, and submerged or floating debris poses navigational hazards and can result in vessel damage. Furthermore, marine debris can damage boats when propellers become entangled on lines or engines stall when plastic bags are sucked into intake pipes (U.S. Commission on Ocean Policy 2004). Other direct costs include the necessity to conduct cleanups, street sweeping and, rescue entangled marine species. There are also indirect costs associated with loss opportunity costs such as a reduction in tourism and recreation, fishing, development and human health (Ofiara 2001).

Notably, plastic is the most common type of marine litter world-wide. Globally, the proportion of plastic among marine debris world-wide ranges from 60 to 80% (Derraik 2002). Sources of plastic are varied and include beach goers, improper disposal of trash on land, stormwater sewers, ships and other vessels, industrial facilities and offshore oil and gas platforms (Gordon 2006). Because of their buoyancy and persistence, plastic items contribute disproportionately to the overall impact of marine debris. Plastic materials accumulate and concentrate organic chemicals and environmental pollutants up to one million times their concentration in the surrounding sea water and many of these chemicals are endocrine disruptors that can be released when the plastics are ingested (Rios 2010). Moreover, ingestion and entanglement with plastics is common, and leads to high rates of mortality and ecosystem disruption among many marine mammal, seabird and fish species.

Furthermore, marine debris can affect public health by creating safety hazards and impairing water quality. Discarded syringes, medical waste, broken glass, ropes, lines, fishing gear pose threats to beach visitors and divers (U.S. Commission on Ocean Policy 2004). A decrease in water quality due to marine debris can lead to beach closures and public health concerns resulting in negative impacts to the local economy by reducing coastal tourism.

*Top 10 Marine Debris Items*

1. Cigarettes and cigarette filters
2. Plastic beverage bottles
3. Plastic bags
4. Caps/ lids
5. Food wrappers & containers
6. Cups, plates, forks, knives & spoons
7. Glass beverage bottles
8. Straws & stirrers
9. Beverage cans
10. Paper bags

\*Source: Ocean Conservancy. Tracking Trash: 2011 Report.

## **Vision**

The vision of the Marine Debris Strategy is to work towards zero debris entering the marine environment from land and zero impact from debris entering the marine environment at sea.<sup>3</sup>

## **Goals and Objectives**

The goal of the Strategy is to address marine debris and its impacts effectively and in a prioritized manner by facilitating action and collaboration among California, Oregon and Washington, federal and tribal governments, academia, industry, and non-governmental organizations with an ultimate vision of zero debris entering the marine environment from land, and zero impact from debris entering the marine environment at sea.

### **Objectives:**

To achieve this goal, the Strategy will facilitate efforts to:

- Prioritize the removal of certain types and locations of harmful marine debris based on established criteria.
- Establish a marine debris baseline along and off the West Coast
- Set target milestones for various sources of marine debris, and within various regions of the West Coast.
- Strive to reduce the amount, prevent harm and negative impacts of derelict fishing gear and other marine debris along the West Coast.
- Significantly reduce marine debris discharge from land-based sources along the West Coast.
- Strive to reduce the amount of plastics and address the impact of marine debris currently present along the West Coast's shoreline and near-shore waters through cost-effective removal.
- Encourage research, survey, assessment, cost-benefits analyses, monitoring and data collection and analysis to build upon existing research, identify best practices for marine debris prevention, streamline data collection and identify marine debris hot spots, accumulation rates, and trends.
- Incorporate education in all aspects of marine debris prevention, reduction, and clean-up programs.

## **Approach of this Strategy**

This strategy adopts a performance-based, non-prescriptive approach towards meeting the goals and objectives. It recommends setting target reduction levels of marine debris by source, with a vision of zero trash to the environment, and then offers a menu of options for achieving these reductions through suggested actions. The approach is based on the recognition that circumstances

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<sup>3</sup> The Marine Debris ACT recognizes the risk of lost fishing gear associated with fishing. The Strategy is not promoting the end of fishing, but envisions minimizing the negative impacts of derelict fishing gear to the greatest extent possible.

are significantly different across a geographic area as large as the West Coast, and that regional differences warrant a high degree of flexibility in achieving common goals. The MD ACT has enlisted a broad array of input, and offers the following recommended actions as effective methods for achieving target reductions. However, the method for reaching these targets is less critical than the need for setting and achieving the targets by whatever means chosen.

## **Prioritization Criteria for Recommended Actions**

When implementing identified actions to reduce and prevent marine debris, going through a prioritization exercise allows for effective removal and disposal of marine debris with limited funds and resources. Furthermore, identifying prioritization criteria can help determine how to best implement the various identified actions. The MD ACT came up with the following criteria for prioritization:

- Human Safety
- Species Impacts
- Lethality
- Habitat Impacts
- Protected Areas
- Permanence
- Economics
- Aesthetics
- Endangered Species

Marine debris that is causing immediate harm to human safety and health should be considered a top priority for removal and disposal. When using these criteria to assess removal projects, it may also be beneficial to rank the criteria based on relative importance to the individual's organization or the Marine Debris Alliance. Recognizing that different regions and organizations have different sets of priorities and will implement recommended actions in their own way, the prioritization criteria were not ranked in this document.

## **Marine Debris Alliance**

The Marine Debris Alliance will work to facilitate the implementation of the strategy. The MD ACT, is currently small (14 members) and limited in scope and representation. The Alliance will allow for a wider variety of entities dedicated to addressing marine debris along the West Coast to get involved in carrying out the recommended actions in this Strategy. Many of the MD ACT members will make up the Alliance and after the completion of the transition, the ACT will sunset. . The MD ACT envisions the Alliance being a diverse coordinating body that adds value by breaking barriers between state agencies, federal government, NGOs, and industry to advance actions that implement

the strategy.<sup>4</sup> It will provide a means to further efficient actions and coordination to eliminate marine debris.

## **Ocean-based Debris**

The 2010 MD ACT Work Plan calls out for identifying recommendations to address ocean-based debris on vessels, as well as ports, terminals and marinas that serve them, but it is not included in this document. The MD ACT determined that due to limited resources, large scope of OBD, and because OBD is covered by regulations elsewhere (MARPOL), there was limited utility in trying to resolve this issue by the MD ACT and the three states. It was also determined that more positive impacts could be made by working on land-based debris and derelict fishing gear.

## **Barriers and Challenges**

There are several barriers and challenges that need to be overcome in order to successfully meet the goals. Major challenges include funding, policy, and lack of data and information. Addressing and overcoming these barriers will help achieve identified objectives.

### **Funding**

Due to the current national economic downturn, there is potential for national, regional, state and local funding for key marine debris programs to be cut or reduced. Insufficient funding can hinder the progress of reaching our objectives because there will be fewer people and less time to work on marine debris issues. Therefore, it is extremely crucial to leverage existing efforts and partnerships to maximize efficiency and minimize cost.

### **Policy**

Policy decisions and legislation that reduce funding or relax current marine debris policies hinders progress towards the objectives. Legislation can provide the mandate and funding that is crucial in maintaining and increasing efforts to work on marine debris issues. Furthermore, there is currently no comprehensive federal or state policy that addresses marine debris. Therefore, local agencies are left to implement their own debris removal and prevention programs to comply with regulations (such as the Clean Water Act) which may become costly.

### **Lack of Data and Information**

An adequate amount of scientific information exists to start implementing targeted actions, but continual progress to reduce the knowledge gap is an important challenge when working on marine debris issues. However, the West Coast region needs to further identify the quantity and composition of marine debris in the ocean itself, emanating from both land and ocean-based

sources and its effects. Lack of a baseline frustrates efforts to quantify the efficacy and progress towards various projects.

## Recommended Actions

### I. Land-based Debris

**Objective:** Strive to significantly reduce the amount of debris entering the ocean from land-based sources along the West Coast through greater reduction of material that has the potential to become marine debris, and prevention of material likely to become marine debris from entering the ocean.

*Each of the following actions is accompanied by a menu of options for how a state, federal, tribal or local government, industry partner, or non-profit organization may seek to achieve that action. The Strategy does not encourage one action over another, as all actions listed have been identified as potentially successful given local circumstances; the Strategy encourages that actions be taken to address what has been acknowledged as a problem issue in the marine debris field.*

#### **Action 1. Identify and leverage existing policies to reduce and prevent marine debris.**

1. Closely track current development of California's trash policy which uses the Clean Water Act (CWA) to reduce trash in stormwater. Investigate if a similar adoption is feasible for the entire West Coast, various states, or permit holders within each state.
2. Review the feasibility of using CA's model language for MS4<sup>5</sup> permits. and evaluate the strength of policy language around trash management in stormwater permits.
3. Analyze regulations and policies on commonly found items in land-based debris.

#### **Action 2. Reduce and prevent most commonly found debris items on the coast and in the ocean.**<sup>6</sup>

Projects and programs that aim to eliminate the loss of commonly found items to the ocean should be promoted.

1. Promote to the best of their ability state and national legislation aimed at reducing and preventing marine debris.
2. Encourage increased placement of more visible cigarette receptacles to promote proper disposal by smokers.

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<sup>5</sup> Some states, cities, or public entities that discharge stormwater are required to obtain municipal separate storm sewer systems (MS4) permits to discharge polluted stormwater runoff.

<sup>6</sup> Based on the workshops, the MD ACT identified cigarette butts as a priority item to prevent and reduce. Cigarette butts are the top item found globally based on Ocean Conservancy's International Coastal Cleanup Day data: <http://www.oceanconservancy.org/our-work/marine-debris/check-out-our-latest-trash.html>

3. Increase educational and outreach efforts directed at smokers that specify public health and marine impacts from cigarette waste.
4. Increase shoreline cleanup efforts to prevent commonly found items from entering the ocean.

**Action 3. Build strong partnerships and work with industries to reduce and prevent marine debris entering the environment.**

Partnering with industries can help reduce marine debris at the source, and create industry incentives to address marine debris. This also engages businesses and ensures that they understand their responsibilities as contributors to the marine debris problem.

1. Conduct an analysis to determine the feasibility of Extended Producer Responsibility (EPR), also known as “product stewardship” initiatives, especially for items that are more likely to become marine debris.
2. Review prevention plans in order to insure that best management practices (BMPs) are being followed in the production of items that prevent the loss of raw material from a facility.
3. Investigate the feasibility of holding producers responsible for cleanup or generating funds to enact cleanup when a spill or raw or finished material occurs.
4. Coordinating with industries and agencies to standardize model language for prevention of trash and loss of material and encouraging the use of the language in permits.
5. Promoting education around reduction, reuse, and recycling initiatives that can both reduce the amount of material potentially lost to the marine environment and encourage greater use of recycled material by industry.

**Action 4: Work with waste management operations and municipalities to prevent and reduce the amount of marine debris entering the environment.**

1. Investigate standardized guidance for landfill cover BMP requirements across the three states.
2. Work with waste management industries to determine best practices for enacting a robust extended producer responsibility effort.
3. When opportunities arise, review and provide comment on BMPs for litter management on beaches

**Action 5. Support improved enforcement of existing laws that deal with marine debris.**

Improve and elevate the enforcement of provisions of the Clean Water Act and local litter laws in order to reduce and prevent marine debris. The Strategy encourages stricter enforcement and the expansion of enforcement programs, where appropriate.

1. Assess and prioritize the most effective ways of enforcing marine debris prevention laws.
2. Identify gaps in enforcement efforts where greater collaboration or support from local and state elected officials would help effect improved enforcement efforts.

## II. Derelict Fishing Gear

**Objective:** Strive to reduce the amount and impacts of derelict fishing gear (DFG) along the West Coast through loss prevention, gear modification to prevent impact if fishing gear is lost, and survey for and removal of derelict fishing gear.

*Each of the following actions is accompanied by a menu of options for how a state, federal, tribal or local government, industry partner, or non-profit organization may seek to achieve that action. The strategy does not encourage one action over another, as all actions listed have been identified as potentially successful given local circumstances; the strategy encourages that actions be taken to address what has been acknowledged as a problem issue in the marine debris field.*

### **Action 1. Build strong partnerships with the fishing industry, management agencies and relevant maritime entities to identify and practice DFG prevention, reduction and appropriate removal measures.**

1. Collaborate with the fishing industry to develop best approaches and measures to reduce DFG and minimize its impacts. Identifying stakeholders and promoting collaboration with the fishing industry will be useful in developing effective approaches, assessment methods, fishing practices, technologies and gear modifications, to reduce gear loss and impacts.
2. Identify and promote existing effective educational efforts in CA, OR, and WA.
3. Survey stakeholder groups for appropriate message deliverers and methods for disseminating educational messages.
4. Develop and adapt educational effective messages.
5. Utilize outreach resources of fishery management agencies and others (e.g., Sea Grant, fishing associations, etc.) to disseminate educational messages to fishing industry.
6. Support cost effective and safe removal of DFG impacting the marine environment.
7. Create a system to report and respond to lost fishing gear. It is easier respond to and retrieve newly lost gear than to search for it later.
8. Evaluate whether increasing financial incentives for fishermen to recover their own DFG (e.g. through deposits) will result in a reduced amount of abandoned fishing gear.
9. Promote programs that come up with innovative incentives that allow fishermen to take stewardship responsibility (ex. tax on fish landings, marine stewardship council certification programs.)

### **Action 2. Assess the DFG locations and accumulation on the West Coast and prioritize information gaps.**

1. Engage the fishing community, state, federal, tribal, local agencies, NGOs, academia and industry to provide DFG data, such as standardized gear identification systems, vessel log books and research documents.
2. Identify and prioritize areas to assess DFG accumulation rates based on DFG impact, quantity lost, gear type and feasibility of removal.

**Action 3. Identify and address barriers to minimize DFG and its impacts.**

1. Consult with the fishing industry and management agencies to identify barriers and potential solutions to address those barriers.
2. Identify rules and regulations that could promote or hinder the removal of DFG to understand how to implement successful programs.
3. Work with the fishing industry and other stakeholders to assist in the evaluation of legislative and regulatory ideas or proposals.
4. Incorporate economic analyses to determine the most cost-effective DFG minimization approaches and methods.
5. Promote research on DFG.

## **Recommended Actions for Cross-Cutting Issues**

Collaboration on cross-cutting issues is crucial for increasing efficiency and reaching goals. Cross-cutting issues include data management; research and information sharing; and education. Entities who may not be working specifically on marine debris, but whose activities may affect or impact the efforts of agencies working on the issue should be included. Benefits of working collaboratively on cross-cutting issues include increased efficiency in working toward a clear, common objective without duplicative efforts. Overarching recommended actions include:

**Action 1. Determine existing amount of marine debris.**

Utilize existing resources and reports to identify current baselines for both land-based debris and derelict fishing gear. This will be critical in determining target reductions.

**Action 2. Determine target reductions and milestones.**

Create realistic and quantifiable targets to ensure that proper steps are being taken through varying methods to reach marine debris reduction and prevention targets.

**Action 3. Elevate the issue of marine debris in each state, by having a strong public outreach effort to promote trash reduction and tie to marine debris.**

### **Data Management**

Many organizations and agencies collect marine debris data, but there is a wide diversity among data cards and the management of the databases using the cards' data. Increasing collaboration and partnerships among entities to create standardized data cards for land-based debris, utilizing them during clean up events and uploading the information to one database will be beneficial for decision makers (policy and management), research, and education.

**Action 1. Create and promote the use of a standardized data card for land-based marine debris.**

Create a protocol to have one database containing standardized land-based marine debris information allows for easy access to data and information in order to locate and compare

beaches that are most impacted, specific sources, and the type and quantity of marine debris found throughout the three states.

**Action 2. Utilize, populate and maintain tri-state database.**

The MD ACT has developed a comprehensive and standardized marine debris database that will ideally incorporate all existing marine debris data for both derelict fishing gear and land-based debris from the three states. Additional efforts and funding is needed to maintain and improve the database. To facilitate the process and maximize the function of the database, participants should:

1. Determine the entity that will manage the database.
2. Determine how to best maintain and evaluate integrity of data.
3. Promote the database to other organizations and entities to increase users.
4. Properly train volunteers on the database to empower volunteers and maintain the integrity of the data.
5. Use database to facilitate prevention, reduction and cleanup of marine debris.
6. Use database to facilitate economic analysis.
7. Use database to help policy formulation and decisions regarding marine debris.
8. Use database to provide information for outreach for changing behaviors and advocacy.

**Research and Information Sharing**

Continual research is being conducted on marine debris issues ranging from expeditions to the North Pacific gyre, impacts of marine debris on marine species and their environment, to alternatives to single-use plastics. It is critical that those involved in marine debris programs stay updated on the most current research in order to make more educated management decisions and create a sound basis for project evaluation.

**Action 1. Promote research opportunities.**

Research opportunities can to lessen the knowledge gap regarding marine debris. Participants should:

1. Work to identify and make accessible all relevant, current and past marine debris policy, research, databases and successful programs and management.
2. Encourage research and identify alternative materials to single-use plastic bags. Currently there is no readily available plastic that is marine biodegradable.
3. Encourage the inclusion of economic analyses in marine debris related research, where applicable. These include:
  - a. Economic analyses of cost of cleanup versus cost of preventing cleanup at the source will be useful in identifying the most effective control measure.
  - b. Economic impact of marine debris on lost ecological services, risks to public health and safety, and reduction in state and local revenues.
  - c. Gather and report information to emphasize cost effectiveness of upstream prevention control.
  - d. Conduct cost-benefit analyses of single-use products as compared to reusable alternatives (e.g. carryout bags, water bottles, coffee cups, etc.).

4. Encourage controlled studies that link chemical components of marine debris on species and ecological damage, as well as bioaccumulation of these chemicals in individuals and food webs.

**Action 2. Promote information sharing among participants.**

Information sharing increases creativity, efficiency, collaboration, partnerships among groups and decreases duplicative research efforts. Information sharing does not pertain to just research, but can be applied to legislative issues and successful marine debris projects.

**Education**

Creating a uniform message to address marine debris can increase effective communication by: 1) reducing the amount of conflicting information being presented to a given audience and 2) strengthening the quality of education on marine debris issues. Sharing successful methods of disseminating information and evaluating programs can aid in implementing new or improving existing programs. Effectively communicating on marine debris will motivate and inspire people to take action to reduce and prevent marine debris.

**Action 1: Research and compile current and past educational messages and campaigns on marine debris.**

This should also include any correlating research on effectiveness of those campaigns, and be made available to the marine debris community and general public.

**Action 2: Develop a working group that includes the WCGA Ocean Awareness and Literacy ("Education") Action Coordination Team, and other academic institutions to develop effective educational messages about marine debris for the region.**

**Action 3: Create a uniform message for disseminating information.**

Publicize the message and encourage its adoption by the marine debris community along the West Coast.

**Action 4. Encourage community involvement through incentive programs such as contests for cleanest beaches.**

**Future Opportunities**

**Japan Tsunami Marine Debris**

On March 11, 2011, a 9.0 magnitude earthquake struck off the coast of Japan created a devastating earthquake that reached heights of up to 130 feet. Of the 5 million tons of debris washed out to sea, an estimated 1.5 million tons of marine debris remain afloat. The Marine Debris Alliance has the opportunity to be a regional conduit for information and assist in readiness and removal plans for the tsunami debris that may reach the West Coast. The Alliance could form new relationships to work with cleanup groups to prepare organizations to conduct rapid response and assist in

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disseminating timely information. In addition, the marine debris database will be crucial in determining the baseline if there is an increase in debris along the West Coast due to the tsunami debris.

## Timeline

	<b>Strategy Deliverable</b>	<b>Timeline</b>
<b>1</b>	Determine baselines for land-based debris and derelict fishing gear through the compilation of data and research.	June 2013
<b>2</b>	Formation and launch of Marine Debris Alliance.	June 2013
<b>3</b>	Launch of marine debris database.	December 2012
<b>4</b>	Creation of reduction targets and milestones.	December 2013

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## **APPENDIX I**

### **Current Projects to Facilitate Actions**

Leveraging current projects is crucial in implementing the Strategy. Numerous successful federal, state, and local marine debris programs and projects exist that would be beneficial for Alliance members or individual groups to partner with or use as models. This section includes a list of marine debris programs that may facilitate strategy actions:

#### **A. Marine Debris Data Collection and Database**

1. At the local, regional, national to international levels, there are many organizations and entities conducting successful land-based marine debris cleanups. The cleanups involve collecting and maintaining data on debris using data cards. These projects should be researched and if applicable, used as models.

#### **B. Derelict Fishing Gear Removal Projects**

1. *California:* The California Derelict Fishing Gear Removal Pilot Project was started in July 2005 by the SeaDoc Society with the help of funding support by the California Ocean Protection Council. During the pilot project, approximately 10 tons of DFG was removed around California's Channel Islands, 773 lost fishing gears were identified, and approximately 198 sq. km of sea floor habitat was cleaned through gear removal. Successful projects to address monofilament fishing lines at fishing piers and dock removed many miles of fishing lines, and installed recycling bins for monofilament fishing line.
2. *Oregon:* New ways of finding and retrieving DFG have been designed and tested in Oregon through a joint project involving Oregon Sea Grant, the Oregon Fisherman's Cable Committee, and the Oregon Dungeness Crab Commission. This project coordinated a diverse group of fishermen, regulators, and agencies to use a modified "trawl/grapple" technique to retrieve DFG, including crab pots and bottom trawl nets. These methods were used by a partnership of the Oregon Crab fisheries, and State and Federal Government to remove over 3,000 derelict crab pots along the entire Oregon coast in 2009 and 2010. The partnership, now industry led, is continuing its effort to locate and remove lost gear.
3. *Washington:* The Northwest Straits Initiative (NWSI), Stillaguamish and Nisqually tribes, and federal, state, and local entities, as well as nongovernmental organizations (NGOs) and industry, have been engaged in derelict fishing gear (DFG) survey and removal for a number of years. Since 2002, NWSI has managed the bulk of DFG survey and removal in the Puget Sound and as of December 31<sup>st</sup> 2012, has removed nearly 4,358 nets and over 2,889 derelict crab pots. They are currently working to get the last 200 nets out of Puget Sound and plan to target fishing gear at below 100 ft. in the future.

### **C. Stormwater**

1. *California, State Water Resources Control Board (SWRCB)*: The SWRCB has regulatory authority for protecting water quality in California. In Southern California, several zero trash total maximum daily loads (TMDL) regulations have been implemented and zero trash allowed for impaired water bodies under the 303 (d) listing of the Clean Water Act<sup>7</sup>. As authorized by the Clean Water Act (CWA), the National Pollutant Discharge Elimination System (NPDES) Permit Program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Point sources are discrete conveyances such as pipes or man-made ditches. NPDES permits in Phase 1 discharges now have permit requirements similar to the southern California Trash TMDL. There is also a statewide trash policy in the development phase that seeks to establish similar policy as that adopted by the San Francisco Bay region for the entire state. Los Angeles also includes a zero floating material and solid, suspended, or settable material objective in their water quality control plan.
2. *Oregon's* stormwater systems' technologies to remove plastics vary among municipalities from low to high and there is no statewide standard. There is currently a large effort on street sweepers to intercept trash before stormwater enters municipal stormwater systems. Sanitation workers say a portion of the plastics in the stormwater system comes from home garbage cans tipping over during winter storms or due to wind.
3. *Washington* Department of Ecology has been delegated authority from the United States Environmental Protection Agency to implement the NPDES permit program. Washington has adopted the Stormwater Management Manual for Western Washington, which establishes minimum requirements and best management practices for stormwater management permits. The manual requires that stormwater detention ponds and other facilities incorporate trash racks and other screening devices, and maintenance requirements for cleaning. It also establishes source control BMPs for specific uses that may generate trash.

### **D. Working with Industries**

1. *California Ocean Protection Council*: The 3 main priorities from *An Implementation Strategy for the California Ocean Protection Council: Resolution to Reduce and Prevent Ocean Litter* can be used as models. All three combined or parts of the recommendation can be used. These include:
  - i) Implement Extended Producer Responsibility for packing waste.
  - ii) Bans items that are likely to become marine debris for which alternatives are readily available.

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<sup>7</sup> More information: <http://www.epa.gov/SoCal/water/la-trash.html>

- iii) Place a fee on items that are likely to become marine debris for which alternatives are not readily available.
2. *California, AB 258*: AB 258 was enacted to control plastic production facilities and the release of pre-production plastic pellet and powders. This law also enables a task force to perform inspections, enforce best management practices at production facilities and levy fines.
3. *Washington, Department of Ecology – Beyond Waste Program*: This program has a 30 year plan to eliminate waste and toxics, and also has a manufacturer-funded program to recycle electronics.

## **E. Reduction measures**

1. Plastics:

### California

California is the leader in implementing local plastic bag ordinances with currently 72 adopted city and county ordinances, San Francisco being the first in 2006. Most ordinances have added a paper bag fee as well as a ban on plastic due to the desire to promote reusable bags as the bag of choice. In 2011, SB 1219 extended the sunset of AB 2449, requiring large supermarkets that distribute plastic bags to collect them for recycling. The bill was set to expire at the end of 2012, but now continues until 2020. Some large retailers also offer a 5 cent credit or other premiums for bringing a reusable bag. Statewide, several attempts have been made to pass plastic bag ban bills over the past several years, including AB 1998 in 2010, although none have been successful.

In 2007, AB 258 was enacted to control plastic production facilities and the release of pre-production plastic pellet and powders. This law also enables a task force to perform inspections, enforce best management practices at production facilities and levy fines. Furthermore, CalRecycle has a Rigid Plastic Packaging Container (RPPC) program. It requires manufacturers of non-food plastic bottles and containers to comply with one of the following: a 25% postconsumer content, a 45% recycling rate, being reusable 5 times or more, or meeting a 10% source reduction.

California's Bottle Bill Recycling Program was enacted in 1987 and 230 billion glass, aluminum and plastic beverage bottles have been recycled since the program's inception. According to CalRecycle's "Biannual Report of Beverage Container Sales, Returns, Redemption & Recycling Rates", California's beverage container recycling rates have increased significantly, from an overall 52% in 1988 to 82% in 2011. In the six years from 2006 to 2011 alone, the program has increased recycling from 13 billion containers per year to over 16.7 billion containers per year. Efforts to expand the bill to include other recyclable materials are in development.

Oregon

Oregon currently has three cities with ordinances that ban plastic bags; Corvallis, Eugene and Portland. Portland became the first city to adopt a ban on plastic bags in the state in 2011, after the state legislature failed to pass a statewide ban. An amendment to include all other retail stores and restaurants goes into effect in 2013.

In 1971, Oregon was the first in the nation to adopt a Bottle Bill. The bill was modified in 2007 to include plastic water bottles and return rates average about 90%. Containers that used to make up 40% of roadside litter now average about 6%. Unfortunately, the bill is starting to lose its effectiveness with recycling rates reducing from 10 years ago. This may be due to inflation as the redemption payment has not kept up; five cents in 1971 equates to 23 cents in 2012, but citizens are currently not receiving as much.

Furthermore, Oregon has a Rigid Plastic Container Law, similar to that in California, implemented in 1991. Plastic manufacturers must comply with one of the following; twenty-five percent recycling rate, twenty-five percent recycled content, or the container must be reused or refilled at least five times.

Washington

In Washington, there are currently seven cities with plastic bag bans. Edmonds was the first to be successful in imposing a plastic bag ban. Seattle also successfully imposed a 20 cent fee on single-use plastic bags in 2009, only to have the American Chemistry Council sponsor an effort to have a voter proposition, which overturned the fee. In December 2011, the Seattle City Council unanimously passed an ordinance banning single-use plastic bags and putting a 5 cent minimum price requirement on single-use paper bags.

Land based debris, including plastics are regulated by the Washington State Department of Ecology. Most land based debris is defined as solid waste and the local agency, such as local health departments, are responsible for distributing solid waste permits.

Further information:

Plastic regulations are inspired by the costly impacts disposable plastic items are having on the environment and the economy. For California, the overall cost to protect waterways and the ocean from litter is over \$412 million each year--with between 8% to 25% attributable to plastic bags alone according to clean up data from San Jose and Los Angeles County (Stickel 2012).

Since plastic bags are generally not cost effective to recycle and recycling rates are very low, bans are proving to be an effective way to reduce certain problematic items such as plastic bags. In 2009, the District of Columbia enacted a law to ban the use of disposable, non-recyclable plastic carry-out bags and set a fee of 5 cents for use of all other disposable bags. Since imposing the fee, the District of Columbia has collected about

\$4.2 million from the fee. The usage of bags has dropped from 22.5 million bags per month prior to the ban to about 3 million per month as of January 2010.

Cities that initiate a plastic bag ban are successful in drastically reducing their usage. Pushback from community members is common during the initial phases of enacting a ban, but after an adjustment period people are able to change their habits and the ordinances are well received.

Industry representatives from grocery store chains have indicated that a statewide single-use bag regulation and/or fee would make it easier and more cost effective to comply with regulations rather than the patchwork of different city and county wide policies currently in place. Additionally, some laws only cover food retailers and not other types of retailers, leading to a very incomplete solution to the problem.

Current efforts to reduce plastic pollution that contribute to marine debris are only piecemeal. City and county plastic bans effectively reduce some plastic bag usage among the three states. Bottle bills are highly effective at increasing recycling as long as the return rate keeps up with inflation. Plastic packaging and plastic preproduction pellets remain concerning with their tendency to end up in the ocean. Stormwater regulations can divert plastics from the oceans but better enforcement is needed for compliance.

## 2. Polystyrene:

### California

Approximately 69 cities in California have been successful in implementing polystyrene bans in some form within the last decade. Cities and counties that have banned polystyrene include Santa Cruz County, cities in Monterey County, City of Los Angeles, and San Clemente. Starting city by city, Santa Cruz County went entirely Styrofoam free in 2008. Many ordinances ban polystyrene take-out food containers at businesses selling food for immediate consumption.

No polystyrene food packaging is recycled anywhere in California, although the plastic industry has attempted to recycle polystyrene transport packaging (at a cost of thousands of dollars per ton). Most curbside recycling programs in California do not accept any polystyrene plastic resin because it contaminates recycling and is too easily accidentally littered in transportation.

### Oregon

Oregon led the way in implementing polystyrene bans with individual communities and cities adopting bans since 1989. Portland and Multnomah County banned the use of polystyrene foam containers in 1989 and McDonald's discontinued statewide use shortly after.

### Washington

Since 2009 two cities in Washington, Seattle and Edmonds, have required all food service products designed for one-time use made from polystyrene to be replaced with either compostable or recyclable material. In 2010, the ban expanded to include plastic utensils and plastic food containers in Seattle. Violating the ban on Styrofoam containers is subject to a civil penalty of up to \$250 for each violation. Issaquah also recently passed a similar ban which took effect in 2011.

Further information:

Recycling polystyrene is problematic. It is not cost effective to reuse polystyrene unless collected at very high rates and is not accepted at most curbside collection programs. Polystyrene food packaging is lightweight and aerodynamic, so it is easily blown into gutters and storm drains even when "properly" disposed of. Polystyrene is also very brittle, so when littered, it quickly breaks into small pieces making cleanup impossible. Polystyrene food packaging is extremely costly to local governments, some of whom are required by law to achieve "zero" trash litter in impaired waterways. Litter clean-up costs billions, and yet is still ineffective. Polystyrene litter would be most easily reduced through a statewide ban.

3. Cigarettes

California

In California, several beaches have adequate reception facilities through support from programs such as CalRecycle and Keep California Beautiful. CalRecycle has a local assistance program that supports local trash and recycling facilities. Keep California Beautiful works with industries to provide recycling and trash reception at state parks and highway rest stops. There are several pilot projects aimed to encourage smokers to dispose cigarette butts properly.

In 2010, Governor Schwarzenegger vetoed a bill that would have banned smoking on all state beaches. However, the cities of Los Angeles, Long Beach, Santa Monica, San Diego and Malibu have similar smoking bans at parks, beaches. Los Angeles County banned smoking on county-run beaches in 2004. Many local governments statewide have imposed similar bans, including almost all city beaches in San Diego County. Many other communities across California have enacted similar laws banning cigarettes at city beaches including: Huntington Beach, Laguna Beach, Seal Beach, Solana Beach, Manhattan Beach, Hermosa Beach, Newport Beach and San Clemente.

Washington

Washington and its local governments currently have no ban on smoking on public beaches.

Further information:

In 2009, Maine adopted a smoke-free law for beaches and parks, but no other state has outlawed cigarettes in its entire park system, according to the group Americans for Nonsmokers' Rights, which tracks such measures. However, in 2011, New York City banned smoking on all beaches, parks and boardwalks.

The 1993 smoking ban in Hanauma Bay, Hawaii was the first in the United States. The motivations that drove the ban were both aesthetic and environmental, and it has been effective since inception, being enforced by both peer pressure and park rangers. The smoking ban and other proactive management measures enacted at Hanauma Bay played a major role in its selection as the number one beach in the United States (Ariza 2012).

The group Keep Sarasota Beautiful (KSB) of Sarasota, Florida initiated a smoking ban through their beach clean-up effort. A report was sent to the Board of County Commissioners recommending a prohibition of smoking on beaches, which polarized this community. County government officials tried to use education to solve the problem (e.g., some people do not consider cigarette butts to be pollution). KSB started a campaign with pocket ashtrays, which had no impact. County officials prohibited smoking on county-run beaches and compromised by designating parking lots and picnic shelters as smoking areas. What started in the county inspired two cities in Sarasota County to follow suit. The ban has resulted in a marked reduction of cigarette butts on Sarasota beaches. Peer pressure is largely responsible for the enforcement of the ban, although the sheriff's deputies have issued some tickets (Ariza 2012).

Successful cigarette bans include research and education as parts of the process. More research may be needed on different strategies for adopting and implementing bans and on the economic implications of smoking bans, especially since beach tourism is often the principal economic engine of coastal communities (Ariza 2012).

#### 4. Extended Producer Responsibility (EPR)

Extended Producer Responsibility, also known as Product Stewardship, is a strategy to place a shared responsibility for end-of-life product management on the producers, and all entities involved in the product chain, instead of the general public; while encouraging product design changes that minimize a negative impact on human health and the environment at every stage of the product's lifecycle. This allows the costs of treatment and disposal to be incorporated into the total cost of a product. It places primary responsibility on the producer, or brand owner, who makes design and marketing decisions. It also creates a setting for markets to emerge that truly reflect the environmental impacts of a product, and to which producers and consumers respond (Product Stewardship 2013).

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<b>California</b>		
Carpet; CalRecycle	<i>Carpet Stewardship Bill</i> ; As an extended producer responsibility recycling program, manufacturers (either individually or through their stewardship organization) design and implement their own stewardship program. CalRecycle's role in the carpet stewardship program is to review and approve plans, check progress, and support industry by providing oversight and enforcement to ensure a level playing field among carpet manufacturers.	2010
Paint; CalRecycle	<i>Architectural Paint Recovery Program</i> ; In very basic terms, manufacturers (either individually or through a stewardship organization), design their own stewardship program. They prepare and implement a plan to reach certain goals and report to CalRecycle on their progress. CalRecycle approves plans, checks progress, and provides oversight and enforcement to ensure a level playing field among paint manufacturers. Other service providers, such as HHW management contractors, local HHW programs, and/or retailers, participate in the program as negotiated through the manufacturer or stewardship organization.	2010
Thermostats; Department of Toxic Substances Control	<i>Mercury-Added Thermostats</i> ; requires a manufacturer that owns or owned a name brand of mercury-added thermostats sold in this state before January 1, 2006, to establish and maintain a collection, transportation, recycling, and disposal program for out-of-service mercury-added thermostats.	2008
Pesticide Containers; Department of Pesticide Regulation	<i>Pesticide Recycling Program</i> ; requires first sellers using certain pesticide containers to demonstrate participation in a certified high-density polyethylene (HDPE) pesticide container recycling program and annually to submit certifying documents to the director of the California Department of Pesticide Regulation.	2008
Batteries; Department of Toxic Substances Control	<i>Rechargeable Battery Recycling Act</i> ; This law does not require manufacturers to operate a collection system. The collection system is to be operated by retailers, while the manufacturer is responsible for incorporating the cost of recycling into the product price.	2006
Cell Phones; CalRecycle	<i>Cell Phone Recycling Act</i> ; This law does not require manufacturers to operate a collection system. The collection system is to be operated by retailers, while the manufacturer is responsible for incorporating the cost of recycling into the product price.	2004
Green Chemistry; Department of Toxic Substances Control	<i>Green Chemistry Law</i> ; The CA Department of Toxic Substances Control is authorized to evaluate and impose regulations on chemicals used in consumer products. In the case that a product contains a hazardous substance for which there does not exist a viable commercial alternative, the Department may require a manufacturer to provide free collection of that product.	2008
<b>Oregon</b>		

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Electronics; Department of Environmental Quality	<i>Oregon E-Cycles</i> ; a statewide program that requires electronics manufacturers to provide responsible recycling for computers, monitors and TVs.	2007
Paint; Department of Environmental Quality	<i>An Act Relating to Paint Stewardship</i> ; The paint stewardship pilot program collected 900,000 gallons of leftover paint in the first two years. Paint recycling is now more convenient throughout the state, particularly in areas where local governments do not offer paint recycling opportunities. Communities that were underserved have new services. In July 2010, the paint industry started a program to reduce paint waste, increase reuse and recycling, and safely dispose of remaining unusable paint. Costs for safely managing leftover paint are incorporated in the purchase price of new paint.	2009
<b>Washington</b>		
Electronics, Department of Ecology	<i>Electronic Product Recycling</i> ; Starting in 2009, electronics manufacturers in Washington began financing the collection, transportation, and recycling system for E-Cycling. As of April 2013, over 174,526,600 pounds have been recycled.	2006
Fluorescent Lights; Department of Ecology	<i>Product Stewardship Recycling Act for Mercury-Containing Lights</i> ; In 2010, the Washington Legislature passed the Washington Mercury-Containing Lighting Recycling Act (SB 5543), establishing a producer-financed product stewardship program for the collection, transportation and recycling of mercury-containing lights: Light-Cycle Washington. No-cost recycling services must be provided for residents in each county and, at a minimum, in every city with population greater than 10,000.	2010

Further Information:

Current programs in place show that EPR can provide local municipalities with significant cost savings. For example, in Snohomish County, Washington electronics producers were required to participate in an EPR program by 2009 due to state law. Manufacturers were free to partner with both private and public sectors collection entities and transfer stations and agreed to pay \$.09 per pound of e-waste collected at county -operated sites. During the first 6 months of 2009, manufactures paid the county \$170,000 to provide collection for 1.9 million pounds of electronics it received. Transportation and processing costs were paid directly by manufacturers. Before the EPR system, the vendor cost to the County for transportation and processing would have been \$336,000. The gross value to the County was \$506,000 (PSI 2009).

A study by the Grocery Manufacturers Association, representing retailers nation-wide, looked at various EPR models on a macroeconomic scale to assess how they change consumer behavior and waste-reduction outcomes. It concludes that the EPR programs studied "may not provide a price signal that is sufficiently differentiated to cause

producers to change package formats," concluding that there is "no evidence to support the assertion that EPR causes changes in package design or selection" (GMA 2012). However, another study by Resources for the Future, found some reductions in material use and product/packaging downsizing in response to EPR policies within several case studies, spanning globally. It concluded that the EPR policies looked at are not likely to provide a strong enough price signal to cause a systematic change in packaging (Walls 2006).

The EPR Working Group, the Product Stewardship Institute and others have indicated that policy design is key to increasing recycling rates and incentivizing packaging redesign and reductions through EPR. The EPR Working Group asserts that EPR programs should intentionally place responsibility on the brand owner who, unlike other stakeholders such as distributors and retailers, has control over product design. One key factor is to make the program mandatory and enforceable. The benefit of such a policy, according to the Working Group, is that producers have flexibility to design the product management system to meet the performance goals established by government, with minimum government involvement. To have the maximum impact toward reducing marine debris, policies would follow the resource conservation hierarchy of reduce, reuse, recycle, and beneficially use (Product Stewardship 2013).