



2021-2025 Virginia Marine Debris Reduction Plan

November 2021



2021 - 2025 Virginia Marine Debris Reduction Plan

November 2021

Acknowledgements

Many thanks to the workshop and survey participants and others who contributed to the development of the 2021-2025 Virginia Marine Debris Reduction Plan and to those who will participate in its implementation.

The Plan was developed during 2020 and 2021 through a participatory and collaborative process involving marine debris stakeholders in Virginia including representatives from state and local governments, nonprofit organizations, academia, industry and private business partners, regional bodies, natural resource managers, indigenous groups, and others. We obtained input from stakeholders through surveys, interviews, marine debris summits, and multiple online meetings. Funding was provided by the Virginia Coastal Zone Management Program through Grant FY 19 Task 94.03 and Grant FY 20 Task 94.04 of the National Oceanic and Atmospheric Administration (NOAA), Office of Coastal Management, under the Coastal Zone Management Act of 1972, as amended. Additional support was provided in part by a grant from the National Marine Sanctuary Foundation in partnership with the NOAA Marine Debris Program.

Written and prepared for the Virginia Coastal Zone Management Program by

Katie Register, Executive Director, Clean Virginia Waterways of Longwood University
Laura McKay, Manager, Virginia Coastal Zone Management Program

Publication editing and design by

Virginia Witmer, Outreach Coordinator, Virginia Coastal Zone Management Program with assistance from the NOAA Marine Debris Program.

Cover photo

Monitoring debris on a barrier island (Hog Island) in Virginia. Photo by Christina Trapani.

For reference purposes, this document may be cited as

Register, K., McKay L., Witmer, V. 2021. 2021-2025 Virginia Marine Debris Reduction Plan. Prepared for the Virginia Coastal Zone Management Program.

For more information, please visit the Virginia Coastal Zone Management Program's Marine Debris web page:

<https://www.deq.virginia.gov/coasts/ocean-management/marine-debris>
or send an email to Clean Virginia Waterways (CleanVA@longwood.edu)

Several actions contained herein reference potential legislative changes. These actions will be carried out by interested partner organizations.

Table of Contents

Inspiring Action	2
Development of the 2021-2025 Plan	2

INTRODUCTION

Marine Debris: A Pressing Problem in Virginia and the Region	4
Impacts of Marine Debris	4
Mostly Plastic, and Mostly Single-use	5
Land-based Sources: Litter, Storm Drains, and the Urban Runoff Connection	6
Water-based Sources of Marine Debris	6
Progress: Litter and Marine Debris Reduction in Virginia	7
Policy implementation	7

ABOUT THE 2021-2025 VIRGINIA MARINE DEBRIS REDUCTION PLAN

Foundations of the Plan	9
Who Will Be Engaged	10
Regional Collaboration	10
Vision	12
Mission	12
Plan Structure	12
Implementation and Reporting	13
Near-Term (2021-23) Action Items	14
Marine Debris Specific Goals	
Consumer Debris, including Single-use Plastic	15
Derelict Fishing Gear and Aquaculture-related Debris	22
Microplastics and Microfibers	28
Abandoned and Derelict Vessels	33
References	37

Inspiring Action

Success depends on planning...and taking action. This Virginia Marine Debris Reduction Plan—updated for 2021-2025—is such a Plan, and it outlines actions that Virginians, collaborating with their partners in the Mid-Atlantic states, can take to reduce a real and growing threat to our coastal waters and ocean: marine debris.

As Jackson Browne laments in his new album, *Downhill from Everywhere*, “*The ocean is downhill from gravity, downhill from everywhere, downhill from all of humanity.*” And as famed oceanographer Althehan Spillhaus displayed in his 1942 projection of the earth, “downhill” is actually all one sea.

So it matters what every person on the planet does with their trash. Jackson Browne also sang, “*They say nothing lasts forever but all the plastic ever made is still here and no amount of closing our eyes will make it disappear.*”

We must take care of the natural world, and keep our waste out of Earth’s waterways and oceans. Virginians of all ages can be active in embracing solutions. Together, we can use this Plan as a roadmap, planning and monitoring tool and a common framework for collaboration that will lead us to cleaner and healthier coastal waters and oceans.

We hope you’ll join us,
Laura McKay, Virginia CZM Program Manager
Katie Register, Executive Director, Clean Virginia Waterways

Development of the 2021-2025 Plan

Recognizing that plastic pollution and marine debris are of local, regional, national, and global concern, the Virginia Coastal Zone Management (CZM) Program conducted a planning process from 2012 to 2014 that culminated in the development of the Virginia Marine Debris Reduction Plan—making Virginia the first state on the east coast to have a Plan in place to reduce marine debris and only the second in the US. Now, this updated Plan further strategically addresses this problem through policies, laws, research, behavior-change, and action on all levels.

The 2021-2025 Virginia Marine Debris Reduction Plan, like the earlier version published in 2014, establishes a comprehensive framework for strategic action and identifies priorities to reduce the impacts of marine debris on Virginia’s coasts, people, and wildlife. This Plan is centered on the development and maintenance of collaborative and diverse partnerships to address marine debris in Virginia, and in collaboration with partners in the Mid-Atlantic region.

Throughout 2020 and 2021 a participatory and collaborative process was undertaken. Included in the process were Clean Virginia Waterways, the Virginia CZM Program, and marine debris stakeholders in Virginia including representatives from state and local governments, nonprofit organizations, academia, industries, private businesses, regional bodies, natural resource managers, and indigenous groups. The process involved gathering input from stakeholders through surveys, interviews, marine debris summits, and multiple on-line meetings.

Participants provided feedback on improvements to the scope and structure of the 2014 Plan, and suggested ways to strengthen Virginia’s efforts to address marine debris. They also voiced support for semi-annual monitoring of accomplishments, and incorporating S.M.A.R.T. (Specific, Measureable, Attainable, Realistic, Timely) goals into this updated Plan. A draft of this Plan was distributed to the wider marine debris community for additional feedback to prioritize the actions and to provide further opportunity to participate in action strategies.



Earth has just one ocean--covering 71% of the planet--as seen in this Spillhaus projection. Graphic courtesy of ArcGIS.

Role of Virginia Coastal Zone Management Program

The Virginia Coastal Zone Management (CZM) Program has provided leadership and funding to strategically address marine debris through prevention, interception, innovation, and removal for ecological, social and economic benefits.

The Virginia CZM Program is a network of Virginia state agencies and coastal localities that implement the state's coastal management laws and policies to protect and manage Virginia's coastal resources. It was established in 1986 through gubernatorial order under the federal Coastal Zone Management Act (CZMA) of 1972, and includes the 29 counties and 17 cities of Tidewater Virginia and all tidal waters to the three-mile territorial sea boundary. The program operates under the federal Coastal Zone Management Act of 1972, as amended, with funding from the National Oceanic and Atmospheric Administration. NOAA, within the federal Department of Commerce, administers the CZMA. The Virginia CZM Program includes the enforceable laws, regulations, and policies that protect Virginia's coastal resources, and fosters sustainable economic development ⁽¹⁾.

The Virginia CZM Program is housed in the Virginia Department of Environmental Quality, within the cabinet-level Secretariat of Natural and Historic Resources. The Virginia CZM Program helps agencies and localities develop and implement coordinated coastal policies and solve coastal management problems. Together, Virginia's localities (represented by Virginia's eight Coastal Planning District Commissions), state agencies, and NOAA form an effective intergovernmental partnership. The Coastal Policy Team (CPT) includes representatives of the Virginia CZM Program's network of natural resource agencies and planning district commissions. The CPT provides a forum for discussion and resolution of crosscutting coastal resource management issues.

Every five years, the Virginia CZM Program is required, under Section 309 of the CZMA, to complete a "coastal needs assessment" for nine coastal issues, one of which is marine debris. The assessment involves prioritizing issues that need attention and solutions. The FY 2011-2015 assessment ranked marine debris as a high priority for the first time and included the creation of a Virginia Marine Debris Reduction Plan as a component of its "ocean resources" strategy (funded by a Virginia CZM Program grant to Clean Virginia Waterways - FY11, Task 95.03). Assessments completed for FY2016 -2020 and for FY2021-2025 also ranked marine debris as a high priority. Thus, while the the Plan was developed as a collaborative effort, the Virginia CZM Program initiated its development and has taken responsibility for encouraging ongoing cooperation necessary to implement various phases and activities described in the Plan.

Role of Clean Virginia Waterways

The mission of Clean Virginia Waterways (CVW) is to enhance the health of Virginia's water resources through pollution prevention, education, and stewardship activities involving Virginians from the classroom to the boardroom. Founded in 1995, CVW is a program of Longwood University in Farmville, Virginia and is affiliated with the Ocean Conservancy. CVW has organized the International Coastal Cleanup in Virginia since 1995 and is recognized as a leader in researching marine debris: sources, impacts and solutions. CVW focuses on prevention of land-based litter through education, collaboration, research, engaging the public in hands-on stewardship through cleanup events, and conducting social marketing research and campaigns.

After the Virginia CZM Program's CPT ranked marine debris as a high priority in 2011, CVW was funded by Virginia CZM Program to help create and implement the first Virginia Marine Debris Reduction Plan (published in 2014). Since 2011, CVW has worked closely with Virginia CZM Program staff to offer summits, workshops, and stakeholder engagement work groups. In 2020, CVW collaborated with the Virginia CZM Program to create the Virginia Abandoned and Derelict Vessel Work Group, bringing together a diverse group to examine solutions to this growing problem.

Introduction

Marine Debris: A Pressing Problem in Virginia and the Region

While we often call this marine debris, all of Virginia’s freshwater and tidal rivers, estuaries, wetlands, beaches, and even the Atlantic Ocean’s submarine canyons are affected by debris – from microplastics to derelict vessels and everything in-between. Litter on land, and debris in our waterways is an enormous and growing problem, and it is important for Virginia to play its part in reducing marine debris from land-based and water-based sources on a statewide level.

Marine debris is defined as any persistent solid material that is manufactured or processed and directly or indirectly, intentionally or unintentionally, disposed of or abandoned into the marine environment or the Great Lakes, according to the National Oceanic and Atmospheric Administration (NOAA).





Marine debris has become one of the most widespread pollution problems in the world’s oceans and waterways, impacting wildlife, human health and safety, habitats, and economies.

Many Names, One Problem

Many terms describe this type of water pollution. “Marine” refers to seawater and the oceans, so some people prefer to call this type of pollution as “aquatic,” to include freshwater rivers and lakes as well as the oceans. Indeed, 60% to 80% of trash in coastal waters and the ocean comes from inland sources via storm drains, streams, and rivers⁽²⁾. Others call this problem “plastic pollution” to put an emphasis on plastics that make up the majority of the debris. No matter what it is called, eliminating plastic and litter from inland lands and waters also prevents it from ending up in the Chesapeake Bay and Atlantic Ocean.

Impacts of Marine Debris

The negative impacts of marine debris are well documented, and further research is underway to better understand the impacts of microplastics and microfibers on the food web—including humans. Of great concern is ingestion by and entanglement of marine or aquatic wildlife. Marine debris also has the ability to smother fragile habitats such as coral reefs and seagrass beds. Marine debris affects tourism, recreation, fisheries, ecosystem functions, quality of life, and economies. Large marine debris items—including abandoned vessels—present threats to navigation, damage to ships and fishing equipment.

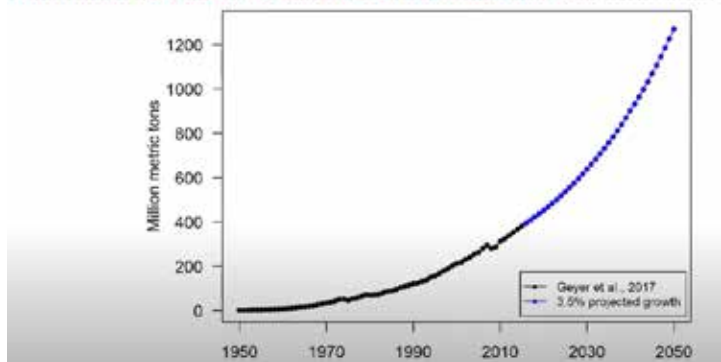
		<p>(Image top left) Oystercatcher chick trapped underneath clam netting. Photo by P. Denmon, USFWS.</p> <p>(Image top right) Sea turtle entangled in fishing net. Photo courtesy of NOAA Marine Debris Program.</p>
		<p>(Image bottom left) Deep sea corals in the Baltimore Canyon are entangled in fishing line. Photo by S. Ross, University of North Carolina-Wilmington.</p> <p>(Image bottom right) Virginia Aquarium Stranding Response Team members examine a young Sei whale found dead in August 2014. A section of a DVD case (inset image) was found in her stomach. Photos by S. Katz, The Virginian Pilot; Virginia Aquarium.</p>

Mostly Plastic, and Mostly Single-Use

While litter and marine debris includes non-plastic items including shopping carts, bicycles, tires, beverage cans, cardboard packaging, and glass bottles, 83% of all debris items are made of plastic according to a four-year (2014-2018) study on four coastal beaches by the Virginia Aquarium & Marine Science Center and Clean Virginia Waterways ⁽³⁾. The Ocean Conservancy estimates that 84% of all items collected during the International Coastal Cleanup are made of plastic (Mallos, 2016), and the Virginia Aquarium & Marine Science Center's project data indicate a nearly identical percentage.

Production of plastics is projected to continue to rise in the coming decades, and most of it will be used once, then disposed ⁽⁴⁾. Since mass-produced plastics do not biodegrade in any meaningful way, we are using a permanent material for very temporary uses ⁽⁵⁾. Inadequate management of plastic waste has led to contamination of our neighborhoods, oceans, coastal waters, rivers, and terrestrial environments ⁽⁶⁾. Microplastics (defined by the NOAA Marine Debris Program as plastic items measuring less than 5 mm [0.2 inches] in their longest dimension) have been detected in surface waters, sediments, beaches, the Chesapeake Bay and the Atlantic Ocean ⁽⁷⁾.

Annual global plastic production



With "business as usual," the amount of plastic waste produced each year is forecasted to grow substantially in the years to come. Graphic courtesy of DebrisFreeOceans.org.

Plastics, Climate Change and Environmental Justice

In addition to impacts on wildlife, habitats, economies, and human health and safety, there are other concerns about the amount of plastic waste we are creating. First, plastics have a large carbon footprint. Production of plastic resins (the overwhelming majority of which come from petroleum), as well as their use and disposal, emits vast amounts of greenhouse gases including carbon dioxide. Carbon dioxide is released from plastic items during incineration, recycling, and composting (for compostable plastics) ⁽⁸⁾.

A report from Surfrider outlines many environmental justice concerns about how plastic production, landfills, and incinerators present disproportionately negative impacts on communities of Black, indigenous, and people of color. ⁽⁹⁾



Impacts to Coastal Economies



(Image top left) Volunteers participating in a cleanup of litter along the banks of the Potomac River. Photo by K. Register, Clean Virginia Waterways.

(Image top right) Photo courtesy of Ocean Conservancy.



Impacts to Humans



(Image bottom left) Rope wrapped around boat propeller. Photo courtesy of NOAA Marine Debris Program.

(Image bottom right) Plastic fragments, fibers, plastic film, plastic foam and plastic monofilament have been found in fish, such as Striped Bass. Photo courtesy of Virginia Outdoors website.

Land-based Sources: Litter, Storm Drains, and the Urban Runoff Connection

As much as 80% of marine debris comes from land-based sources ⁽¹⁰⁾. The sources of litter in our environment are myriad. Some litter results from inadvertent or intentional discards by people, while other litter comes from poor management of waste. While many people believe that storm drains in urban and developed areas transport rainwater to a place where it is “cleaned up,” this is rarely true. Litter and trash (along with pet waste, pesticides, herbicides, fertilizers, and motor oil) are often carried by stormwater directly into streams, bays, and the ocean.

Most urbanized areas have storm sewer systems that convey stormwater from city streets to local streams and rivers. Under the Clean Water Act, government-owned/operated municipal storm sewer systems in large and mid-size localities are regulated as point sources and are called municipal separate storm sewer systems (MS4s).

In Virginia, there are 116 MS4 permits (105 Phase II for smaller cities, and 11 Phase I for larger cities), which are regulated under the Virginia Stormwater Management Act through the Virginia Stormwater Management Program (VSMP). The Virginia Department of Environmental Quality administers this program. Permits require MS4 owners/operators to implement a series of programs to reduce the discharge of pollutants in order to protect the water quality of nearby streams, rivers, wetlands, and bays. This includes keeping litter and trash out of storm drains (DEQ, 2021).

Water-based Sources of Marine Debris

Top Twenty Items Virginia 2019 International Coastal Cleanup

Item	Percent
1 Cigarette Butts	14.87%
2 Beverage Bottles (Plastic)	11.48%
3 Grocery Bags (Plastic)	10.38%
4 Food Wrappers (candy, chips, etc.)	10.20%
5 Beverage Cans.....	6.66%
6 Other Plastic Bags	5.36%
7 Bottle Caps (Plastic)	5.25%
8 Cups, Plates (Plastic + Foam)	4.41%
9 Beverage Bottles (Glass)	3.72%
10 Straws, Stirrers	3.23%
11 Other Plastic/Foam Packaging	2.97%
12 Lids (Plastic)	2.02%
13 Bottle Caps (Metal)	1.91%
14 Take Out/Away Containers (Plastic + Foam)...	1.75%
15 Construction Materials	1.41%
16 Cups, Plates (Paper)	1.24%
17 Cigar Tips	1.18%
18 Other Packaging	1.04%
19 Forks, Knives, Spoons	0.88%
20 Tobacco Packaging/Wrap	0.83%

Data from Clean Virginia Waterways and Ocean Conservancy

Marine debris does not all come from the land. Ocean-based (or water-based) sources include derelict fishing gear (e.g., nets, crab pots, fishing line, and other commercial and recreational fishing equipment) that is lost or abandoned. Water-based sources of marine debris can come from commercial fishing vessels, merchant ships, cruise ships, recreational fishing and pleasure craft, petroleum rigs and drilling operations, naval and other government vessels. Some vessels illegally discharge marine galley waste and other forms of trash into coastal and offshore waters. Some debris is swept or blown from vessels. Abandoned and derelict vessels also litter ports, waterways and estuaries, creating a threat to navigation, recreation, and the environment.

Progress: Litter and Marine Debris Reduction in Virginia

Virginia Plastic Pollution Prevention Network

The Virginia Plastic Pollution Prevention Network (VPPPN) was established in 2020 by Clean Virginia Waterways of Longwood University, the Virginia CZM Program and Eco Maniac Company as an outcome of the Virginia Marine Debris Reduction Plan. Its mission is to promote and facilitate coordination, collaboration, and communication among groups working to reduce plastic pollution throughout the Commonwealth of Virginia. Members of the VPPPN are organizations that are working on issues related to plastic pollution including non-profits, educational facilities, businesses, trade industries, researchers and governmental agencies. The VPPPN is expected to demonstrate the benefits that increased collaboration can bring to the many and diverse issues around marine debris and plastic pollution. Administrative support for the VPPPN is provided by Clean Virginia Waterways.

<https://virginiaplasticpollutionpreventionnetwork.wildapricot.org>

A great deal has been accomplished in Virginia to prevent litter and marine debris as well as better understand the sources, impacts, and fate of marine debris. Leadership has been provided by state agencies, local governments, nongovernmental organizations, researchers, formal and informal educators, and citizen volunteers. Activities range from regulatory and non-regulatory to litter prevention and fee programs, and to monitoring and cleanup activities. Annually, several thousand Virginians are involved in litter cleanups resulting in tens of thousands of pounds of debris being removed from inland and coastal waterways. One such cleanup, the International Coastal Cleanup in Virginia, engages volunteers in collecting data, which shows some of the top types of litter and marine debris in the state.

The publication of the Virginia Marine Debris Reduction Plan in 2014 led to a more unified and coordinated approach to address marine debris.

Examples of increased collaboration include the Virginia Marine Debris Summits in 2016 and 2019, the creation of a Virginia Abandoned and Derelict Vessel Work Group, a Virginia Plastic Pollution Prevention Network (which meets monthly), and annual Stormwater and Litter Workshops. New policies and laws have been passed to reduce some of the common and harmful types of marine debris.

Policy Implementation

Legislation and policies enacted in Virginia in 2020 and 2021 target some common and harmful sources of marine debris.

- **Plastic bags:** H.B. 534 allows local governments to place a 5-cent tax on plastic shopping bags.
- **Balloons:** H.B. 2159 bans the intentional release of helium-filled balloons.
- **Polystyrene containers:** H.B. 1902 phases out the use of single-use expanded polystyrene (EPS, and sometimes called Styrofoam), as food service containers. Certain chain restaurants have until July 1, 2023 to stop EPS use, and all other food vendors have until July 1, 2025.
- **Clam netting:** In 2021 the Virginia Marine Resources Commission, the Shellfish Growers of Virginia, the Virginia CZM Program and Clean Virginia Waterways signed an agreement for addressing clean-up of loose clam netting on Virginia's Eastern Shore.



Legislators, representatives from environmental organizations and others watch as Governor Ralph Northam signs H.B. 2159 which bans the intentional release of helium-filled balloons in Virginia. Photo by Virginia Witmer, Virginia CZM Program

- **Single-use plastics in universities and state agencies:** Executive Order 77, announced in March 2021, directs state universities and agencies, by July 2021, to stop buying, selling or distributing single-use bags, straws, cutlery, water bottles, and EPS food containers. In addition, all state agencies will develop a Plastic Pollution Reduction Plan to eliminate all non-medical single-use plastic and expanded polystyrene objects, and replace them with reusable, compostable or recyclable items.

Phase Out Schedule for all non-medical single-use plastic:

- 25 percent reduction by December 31, 2022
 - 50 percent reduction by December 31, 2023
 - 75 percent reduction by December 31, 2024
 - 100 percent reduction by December 31, 2025
- **Virginia Litter Tax:** In 2020, the Virginia Litter Tax was raised for the first time in 43 years – from \$10 to \$20 for businesses that manufacture, wholesale, distribute, or sell products from fourteen categories: food for human or pet consumption, groceries, tobacco products, soft drinks and carbonated water, alcoholic beverages, newspapers and magazines, motor vehicle parts, paper products, glass containers, metal containers, plastic or synthetic fibers, cleaning products, non-drugstore sundry products, and distilled spirits. An additional annual litter tax (for each location that manufactures, sells, or distributes groceries, soft drinks or beer) was raised from \$15 to \$30. So a grocery store chain with 10 locations in Virginia will owe \$50 (\$20 plus \$30) for each grocery store, or \$500 total ⁽¹¹⁾.

Revenue from the Litter Tax (in addition to excise taxes on soft drinks, beer and wine coolers) are deposited into the Litter Control and Recycling Trust Fund, and distributed by the Virginia Litter Control and Recycling Fund Advisory Board ⁽¹²⁾.

The Board (managed by the Virginia Department of Environmental Quality) provides funds for litter prevention and recycling programs under a non-competitive grant program based on population and road miles.

In Fiscal Year 2020 (July 1, 2019 through June 30, 2020), the litter taxes generated \$1,864,527. The FY2020 Fund included the following revenues:

- Litter Tax: \$878,294
- Beer Tax: \$769,390
- Soft Drink Tax: \$216,842

For the 2021 grant year, \$1,708,156 was disbursed among 187 applicants. An additional \$95,035 (approximately 5% of the net resources allocated for the Litter Control and Recycling Fund) was distributed to 13 localities in 2021 through competitive grants for regional litter prevention, recycling educational programs and pilot projects ⁽¹³⁾.

As noted by LitterFreeVA.org, “Virginia’s investment in litter abatement falls far behind efforts other states have made.

- a. The Tennessee litter tax generated \$5.6 million in 2018 (Pop. 6.77 million)
- b. The Washington state litter tax brings in \$11.4 million every year (Pop. 7.5 million)
- c. The Nebraska litter tax generates about \$1.5 million annually (Pop. 1.92 million) ⁽¹⁴⁾

In comparison, Virginia, with a population of 8.5 million people, generated \$1,907,251 from the Virginia Litter tax in 2019, which came to about \$0.22 per Virginia resident ⁽¹⁴⁾. Now that the tax has doubled, it is still lower than states with smaller populations. If the Virginia litter tax had kept up with inflation, it would be more than \$40 annually per business (or \$100 annually for businesses involved with soft drinks and beer), and generate more than \$8 million annually ⁽¹⁴⁾.

About the 2021-2025 Virginia Marine Debris Reduction Plan

While the Plan was developed through the Virginia Coastal Zone Management Program, the scope of the Plan affects more than just the coastal zone. Any strategy that prevents litter from reaching the coastal and ocean waters of Virginia will also help prevent litter from entering Virginia's freshwater streams and rivers. Indeed, combating marine debris requires a watershed approach.

The Plan also aligns with the goals, and supports the commitments of Virginia state agencies, including the Department of Environmental Quality (DEQ), the Marine Resources Commission (VMRC), Department of Conservation and Recreation (DCR), Department of Wildlife Resources (DWR), as well as local initiatives. For example, this plan aligns with the Virginia CZM Program's mission to create more vital and sustainable coastal communities and ecosystems, as well as the program's coastal resource protection and coastal management coordination goals. Further, it aligns with DEQ's mission to protect and enhance Virginia's environment and promote the health and well-being of the citizens of the Commonwealth.

Foundations of the Plan

Contributors to the Plan recognize that promoting justice, equity, diversity and inclusion, regular communication, capacity building, and coordination of diverse stakeholders are essential to maintaining the strategic partnerships needed to accomplish the goals of this Plan.

The following core principles serve as the foundation for the Virginia Marine Debris Reduction Plan and its implementation.

Politically, socially and economically feasible in Virginia – The Plan must be politically, socially, and economically feasible and align with other goals as identified within the Virginia CZM Program, DEQ, VMRC, other state agencies, and when feasible with regional and local initiatives.

Evaluating progress as a key to success – Monitoring and evaluation of each step of this plan is critical through transparent reporting of progress and achieving key milestones. Actions should be measurable as described in the SMART approach (Specific, Measurable, Achievable, Realistic and anchored within a Time Frame).

Utilizing multiple approaches – Solutions should come from a combination of:

- Behavior change campaigns, using social marketing or Community-Based Social Marketing which goes beyond simple education and outreach;
- Policies and enforcement;
- Increased responsibilities of producers, manufacturers and distributors;
- Informed consumers;
- Acceptable, affordable, and readily available substitutes (e.g., fabric shopping bags);
- Increased infrastructure to capture materials at sources and increase “ease” in doing the right thing with waste items

Promote Justice, Equity, Diversity, and Inclusion: The Plan will incorporate the principles of diversity and inclusion as a core value across all goals. As part of a holistic approach to combating marine debris, partners in implementing the Plan are committed to promoting inclusion and serving a diverse community by including new voices and actions to support underserved communities and nontraditional stakeholders. The local, regional, and global challenges of

marine debris can impact some communities more than others. The Plan's partners will increase collaboration with people and communities with diverse experiences and backgrounds to foster innovative and creative ideas to reach the best possible solutions to help reduce marine debris. Additionally, partners will seek diverse collaborators in culturally competent ways, including language considerations and materials best suited for different communities.

Communicate: Partners will use existing communication platforms, such as Virginia Marine Debris Summits and the monthly meetings of the Virginia Plastic Pollution Prevention Network, to engage in continued implementation of the Plan, and to share results of the Plan – including lessons learned and resources developed.

Build Capacity: During implementation of the Plan, partners will identify and share capacity building opportunities with the marine debris community, also engaging non-traditional stakeholders.

Coordinate: Implementing the Plan will include regular meetings and webinars to highlight progress and spread awareness about ongoing research, and to disseminate education and outreach/social marketing products on the Virginia Plastic Pollution Prevention Network, PreventBalloonLitter.org, and other public-facing websites. Partners will coordinate to ensure that Virginia's Plan integrates and aligns with the Mid-Atlantic Marine Debris Action Plan. Additionally, partners will continue to raise awareness about the availability of the NOAA-published Virginia Marine Debris Emergency Response Guide (<https://marinedebris.noaa.gov/emergency-response-guide/virginia-marine-debris-emergency-response-guide>) and the accompanying Field Reference Guide. The purpose of these is to improve preparedness for response and recovery operations following an acute waterway debris incident in Virginia from storms and other natural events. The documents outline existing response structures at the local, state, and federal levels to facilitate a coordinated, well-managed and immediate response to waterway debris incidents impacting coastal areas in the Commonwealth of Virginia.

Who Will Be Engaged

This Plan serves as a statewide roadmap for nonprofit organizations, local governments, state agencies, regional partners, researchers, and industry as we work together on sustained approaches to reducing the flow of plastic trash and other trash items into our coastal waters.

Due to the complexity of marine debris issues, many stakeholders can play a role in this Plan's implementation, including private citizens, government agencies and nongovernmental organizations. Execution of the Plan will reinforce current multi-agency efforts within state government to reduce litter and marine debris, and increase the health of Virginia's rivers, bays, and coastal and ocean waters.

The Virginia General Assembly and other policy makers have a role too because policies and laws are part of the solution to marine debris.

Regional Collaboration

Given that marine debris is a transboundary problem (trash travels!), this updated Virginia Marine Debris Reduction Plan calls for close collaboration with other states across the Mid-Atlantic, including Delaware, Maryland, New Jersey, New York, and the District of Columbia. In fact, debris types are found commonly and consistently across the region, including consumer debris, such as cigarettes, single-use plastic bags, beverage containers and bottles, food wrappers and containers, cutlery, and balloons, as well as derelict fishing gear, microplastics and microfibers, and abandoned and derelict vessels.

Several commercially and ecologically important species in this region, including shrimp, crabs, lobsters, sturgeon, flounder, seabass, oysters, whales, sea turtles, and seabirds, will benefit from a regional collaboration.

The Virginia CZM Program is a founding member of the Mid-Atlantic Regional Council on the Ocean (MARCO), which includes representatives from New York, New Jersey, Delaware, Maryland, and Virginia. This partnership was formed in 2009 to address shared regional issues and provide a regional voice for solving ocean problems—including preventing marine debris. The Virginia CZM Program Manager leads MARCO’s Mid-Atlantic Marine Debris Work Group, which includes several Virginia partners.

Marine Debris in Mid-Atlantic States

	Delaware	Maryland	New Jersey	New York	Virginia
1	Cigarette Butts	Cigarette Butts	Bottle Caps (Plastic)	Cigarette Butts	Cigarette Butts
2	Bottle Caps (Plastic)	Bottle Caps (Plastic)	Food Wrappers (candy, chips, etc.)	Bottle Caps (Plastic)	Beverage Bottles (Plastic)
3	Food Wrappers (candy, chips, etc.)	Beverage Bottles (Plastic)	Straws, Stirrers	Food Wrappers (candy, chips, etc.)	Grocery Bags (Plastic)
4	Beverage Bottles (Plastic)	Food Wrappers (candy, chips, etc.)	Cigarette Butts	Straws, Stirrers	Food Wrappers (candy, chips, etc.)
5	Beverage Cans	Straws, Stirrers	Beverage Bottles (Plastic)	Beverage Bottles (Plastic)	Beverage Cans
6	Straws, Stirrers	Take Out Containers (Plastic + Foam)	Cigar Tips	Bottle Caps (Metal)	Other Plastic Bags
7	Lids (Plastic)	Beverage Cans	Grocery Bags (Plastic)	Grocery Bags (Plastic)	Bottle Caps (Plastic)
8	Beverage Bottles (Glass)	Beverage Bottles (Glass)	Other Plastic Bags	Cups, Plates (Plastic+Foam)	Cups, Plates (Plastic+Foam)
9	Other Plastic Bags	Lids (Plastic)	Cups, Plates (Plastic+Foam)	Take Out Containers (Plastic+Foam)	Beverage Bottles (Glass)
10	Construction Materials	Cigar Tips	Beverage Cans	Beverage Cans	Straws, Stirrers
11	Other Plastic/Foam Packaging	Grocery Bags (Plastic)	Beverage Bottles (Glass)	Beverage Bottles (Glass)	Take Out Containers (Plastic+Foam)
12	Cups, Plates (Plastic+Foam)	Cups, Plates (Plastic + Foam)	Forks, Knives, Spoons	Other Plastic Bags	Other Plastic/Foam Packaging
13	Take Out Containers (Plastic + Foam)	Fishing Line (1 yard/ meter = 1 piece)	Bottle Caps (Metal)	Other Plastic/Foam Packaging	Lids (Plastic)
14	Grocery Bags (Plastic)	Other Plastic/Foam Packaging	Toys	Lids (Plastic)	Bottle Caps (Metal)
15	Cigar Tips	Forks, Knives, Spoons	Tampons/Tampon Applicators	Forks, Knives, Spoons	Construction Materials
16	Bottle Caps (Metal)	Other Plastic Bags	Balloons	Cigar Tips	Cups, Plates (Paper)
17	Fishing Line (1 yard/ meter = 1 piece)	Bottle Caps (Metal)	Other Plastic Bottles (oil, bleach, etc.)	Balloons	Cigar Tips
18	Forks, Knives, Spoons	Construction Materials	Take Out Containers (Plastic+Foam)	Cups, Plates (Paper)	Other Packaging (Clean Swell)
19	Cups, Plates (Paper)	Cigarette Lighters	Other Plastic/Foam Packaging	Construction Materials	Forks, Knives, Spoons
20	Balloons	Strapping Bands	Tobacco Packaging/ Wrap	Tobacco Packaging/ Wrap	Tobacco Packaging/ Wrap

Data from the Ocean Conservancy© TIDES online database. The data, collected by volunteers during the annual International Coastal Cleanup, include inland as well as coastal sites.

At the same time this Plan was being updated, NOAA's Marine Debris Program began development of the Mid-Atlantic Marine Debris Action Plan ⁽¹⁵⁾. The Mid-Atlantic Marine Debris Action Plan establishes a comprehensive framework for strategic action to ensure the Mid-Atlantic and its coasts, people, and wildlife are free from the impacts of marine debris. This Action Plan is centered on the development and maintenance of collaborative and diverse partnerships to address marine debris in the Mid-Atlantic region.

Aligning the goals and actions, where appropriate, of the Virginia and the Mid-Atlantic plans should further enhance regional efforts to reduce marine debris. Coordination will be enhanced through the inventory of projects available on the Mid-Atlantic Marine Debris Collaborative website. <https://midatlantic-mdc.diver.orr.noaa.gov/> This database contains information on all projects--past and underway--throughout the Mid-Atlantic region ⁽¹⁾.

Vision

Partners in this plan envision a Virginia with communities, habitats, coastlines and the ocean free from litter and marine debris.

Mission

To reduce marine debris and strengthen partnerships to understand, prevent, remove, and mitigate land-based and water-based sources of marine debris through increased research, preventive actions, reductions in impacts, and collaborative efforts of diverse groups for ecological, social, and economic benefits.

Plan Structure

This Plan is centered on the development and maintenance of strategic partnerships to address marine debris in Virginia, and is structured into goals, strategies, objectives, and actions.

Marine Debris Specific Goals

- Goal 1: Understand, Prevent, and Mitigate the Impacts of Consumer Debris and Single-use Plastics*
- Goal 2: Understand, Prevent, and Mitigate the Impacts of Derelict Fishing Gear*
- Goal 3: Understand, Prevent, and Mitigate the Impacts of Microplastics and Microfibers*
- Goal 4: Prevent and Mitigate the Contributions of Abandoned and Derelict Vessels*

Strategies

Strategies are cross-cutting methods for achieving goals. Strategies are shared across debris types and goals, and will facilitate use of best practices across the goal areas. The strategies are: Prevention, Behavior Change (Education, and Outreach); Research and Monitoring; Proper Disposal and Infrastructure; Removal; and Policy, Management, Legislation and Enforcement.

Objectives

Objectives define how each strategy will be achieved. Typically, there are several objectives per strategy.

Actions

Actions are discrete projects and activities supporting an objective undertaken to achieve the associated strategy and goal. These specific, one- or multi-year steps are needed to advance or complete each objective by the conclusion of the Plan. Some actions will build popular and political support for policies and laws that will reduce marine debris. Many of the actions will also encourage the creation of green jobs.

Leads and Partners

In the Virginia Marine Debris Reduction Plan, leads and partners are entities that have volunteered to carry out a specific action, pending the availability of resources and capacity (e.g., funding, staff, time, materials). Leads are responsible for undertaking actions that fulfill the Objectives and for reporting on the progress, challenges, and completion of the actions. Leads, when listed, are represented in bold letters. Please note, If there is no organization in bold, there's no lead identified for that specific action. Partners are responsible for supporting and undertaking actions that fulfill the objective and for providing input on progress. The Virginia CZM Program, through their staff time and grants to Clean Virginia Waterways, will facilitate implementation of the Plan, monitor reported progress, update the Plan, and promote information-sharing with partners in the Mid-Atlantic marine debris community.

Implementation and Reporting

Regular communication is essential to maintain the strategic partnerships needed to accomplish the goals and objectives of the Virginia Marine Debris Reduction Plan. Clean Virginia Waterways and Virginia CZM Program staff will facilitate overall coordination of check-ins and reporting, and will coordinate closely with NOAA Marine Debris Program staff as they work on their semi-annual progress check-ins.

All goals, strategies, objectives, and actions have a timeline of five years (2021 - 2025) with some specific actions being time-bound by shorter end dates. Metrics to track accomplishments will be included in online semi-annual reports using metrics suggested by partners and leads.

In person and/or virtual meetings will be scheduled as needed to share progress on their actions. Virginia Marine Debris Summits are scheduled for 2022 and 2025. Moving forward, Plan partners will be working hard to promote inclusion and serve a diverse community by including new voices and actions to support underserved communities and nontraditional stakeholders as a holistic approach to combat marine debris in the region.

In 2025, the Plan will be evaluated for its overall success, and specific challenges and gaps identified that impeded or may have impeded any actions, strategies or goals of the Plan. The Plan could then be updated again in 2025-26.

Near-Term (2021-23) Action Items

An objective of the Virginia Marine Debris Reduction Plan was to outline an approach for the near-term (2021-2023) and the mid-term (2024-25). Mid-term priorities will be assessed in 2023.

Near term actions identified based on input from stakeholders are:

1. Analyze existing legislation and policies and provide recommendations to support waste minimization of the most common and harmful items found as marine debris (e.g., single-use plastic bags, food and beverage packaging, cigarette butts).
2. Facilitate implementation of Virginia's new laws and policies by raising public awareness, working with vendors, and taking other steps to ensure adherence to the laws.
 - allowing communities to place a 5-cent fee on plastic shopping bags.
 - ban the intentional releasing of helium-filled balloons
 - phase out the use of expanded polystyrene (EPS) food packaging in restaurants and by food vendors
3. Measure public support for new laws and policies that will reduce the sources of marine debris. Survey will also gather data on attitudes, trusted messengers, and information that will assist in crafting successful behavior change campaigns.
4. Continue to promote and facilitate coordination, collaboration, and communication among groups working to reduce marine debris and plastic pollution through the Virginia Plastic Pollution Prevention Network, and by hosting a Virginia Marine Debris Summit in Fall 2022.
5. Provide financial support for pilot programs by partnering with local governments, NGOs, and others to develop projects that address actions in the Plan.
6. Build upon the current industry/government work group (which is currently organizing removal of derelict clam nets) by exploring alternatives to plastic netting used in clam aquaculture.
7. Develop and implement a campaign to reach out to the media and other influencers regarding intentional balloon release events. Media regularly cover balloon releases. In fact, some groups interested in raising awareness for their cause conduct a balloon release just so reporters will cover the event. Asking media outlets to stop giving coverage to balloon releases could be one way to help change this social norm ⁽¹⁷⁾.
8. Working with mid-Atlantic partners, develop and implement a social marketing campaign to increase the use of reusable water bottles at beaches.
9. Continue to co-facilitate meetings of the Virginia Abandoned and Derelict Vessel (ADV) Work Group and achieve a consensus on policy recommendations. A Final Report by Clean Virginia Waterways and the Virginia CZM Program will detail the stakeholder engagement process, lessons learned from interviews with other states, background research, and an analysis of a preliminary ADV inventory for Virginia, including geospatially referenced locations of ADV.
10. For long-term tracking and assessment of marine debris and reduction efforts, repeat monitoring at the four index beaches that were surveyed monthly in 2014-2018 by the Virginia Aquarium & Marine Science Center and Clean Virginia Waterways (funded by Virginia CZM Program and NOAA). The 2014-18 research followed the NOAA Marine Debris Program's protocol for surveys.



Consumer Single-use Plastics

Over the past few decades, production of plastic items and single-use disposable items has risen sharply -- especially food-related packaging, and beverage items (bottles, caps, cups, lids, straws, stirrers). The result can be seen in freshwater rivers, coastal waters, and the ocean where synthetic materials like plastic are found on the water surface, in the water column, and in the benthic (bottom) regions of water bodies. While methods of determining abundance of marine debris vary, there is agreement that the majority of marine debris (up to 84 percent) is made up of plastics. The balance is made of glass, metal, rubber or paper/cardboard including shopping carts, bottles, cans, tires, packaging, etc.

Goal 1: Understand, Prevent, and Mitigate the Impacts of Consumer Debris (Mainly Single-use Plastic)

Consumer Debris consists of ubiquitous human-made materials and is dominated by single-use plastics. In Virginia, common debris items include single-use bags and bottles, polystyrene cups, balloons, cigarettes, food containers, straws, as well as larger debris, such as tires, large appliances, and other consumer products.

Goal Performance Metric: Reduction in marine debris from consumer items.

Strategy 1.1.: Prevention, Behavior Change, Education, Outreach

Objective 1.1.1.: By the end of 2025, promote information-sharing and support outreach, educational and social marketing campaigns targeted at consumer debris items to raise public awareness of available science, data collection, research, laws, and regulations as steps leading to long-term changes to behavior and improve efforts to address marine debris.

<p>Factor: Lack of outreach to the public (Knowledge/Information)</p>	<p>Action 1.1.1.1.: By the end of 2025, collaborate with Mid-Atlantic partners to create or adapt and disseminate at least five (5) outreach products on consumer debris, that is relevant or could be replicated across the region, including fact sheets, public displays, infographics, one pagers, tool kits, templates, and manuals of best practices about consumer debris items, and make them available online for diverse audiences.</p> <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan, Action 1.1.1.1.</i></p>	<p>Lead(s) and Partner(s): Keep Virginia Beautiful, Clean Virginia Waterways in collaboration with the Virginia Coastal Zone Management Program, Elizabeth River Project, Fairfax County Stormwater Planning Division, NOAA Marine Debris Program, Northern Virginia Regional Commission, Ocean Conservancy, PlanRVA, Prince William County, Public Works Department, Prince William Soil and Water Conservation District</p>
<p>Factor: Lack of coordination and communication (Knowledge/Information)</p>	<p>Action 1.1.1.2.: Continue to foster coordination, cooperation, and communication among government agencies (federal, state, and local), nonprofit organizations, research institutions, industry, and consumers through monthly announcements and monthly meetings of the Virginia Plastic Pollution Prevention Network, as well as the VPPPN Facebook page, online forums and websites.</p>	<p>Lead(s) and Partner(s) Clean Virginia Waterways in collaboration with the Virginia Coastal Zone Management Program, Chesapeake Bay Foundation (Clean the Bay Day), Eco Maniac Company, Northern Virginia Regional Commission, Ocean Conservancy, PlanRVA, Virginia Plastic Pollution Prevention Network</p>
<p>Factor: Lack of communication about projects, practices and research (Knowledge/Information)</p>	<p>Action 1.1.1.3.: Maintain and expand the inventory of litter-prevention and marine debris projects, best practices, social marketing campaigns, webinars, summits and research that are underway within Virginia to address marine debris from consumer sources, sharing through using the Mid-Atlantic Marine Debris Collaboration Portal and the Virginia Plastic Pollution Prevention Network website.</p>	<p>Lead(s) and Partner(s): Clean Virginia Waterways in collaboration with the Virginia Coastal Zone Management Program, Northern Virginia Regional Commission, Ocean Conservancy, PlanRVA, Virginia Plastic Pollution Prevention Network</p>

<p>Factor: Lack of behavior change campaigns to reduce marine debris from specific sources (Knowledge/Information)</p>	<p>Action 1.1.1.4.: By the end of 2025, support research, design, development and implementation of social marketing campaigns to reduce marine debris from specific sources such as balloons, single-use plastic bags, food and beverage items, and cigarette butts using strategies developed with regional partners and promoted through social media including preventballoonlitter.org.</p> <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 1.1.1.2. and 1.1.1.3.</i></p>	<p>Lead(s) and Partner(s): Virginia Coastal Zone Management Program in collaboration with Clean Virginia Waterways, Eco Maniac Company, Elizabeth River Project, Fairfax County Stormwater Planning Division, George Mason University, Keep It Beachy Clean, Keep Prince William Beautiful, Keep Virginia Beautiful, Lynnhaven River NOW, NOAA Marine Debris Program, Northern Virginia Regional Commission, Ocean Conservancy, PlanRVA, Prince William County Public Works Department, Prince William Soil and Water Conservation District, Virginia Aquarium & Marine Science Center</p>
<p>Factor: Lack of knowledge about how purchasing decisions can lead to fewer single-use waste items (Knowledge/Information)</p>	<p>Action 1.1.1.5.: By the end of 2025, all partners will promote sustainable and waste reducing initiatives in their respective office, school or institution operations and events to reduce consumer debris and single-use plastic using Virginia Green event guidelines. This will include purchasing policies and policies to encourage reusable food and beverage items.</p> <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 1.1.1.4.</i></p>	<p>Lead(s) and Partner(s): Clean Virginia Waterways in collaboration with the Virginia Coastal Zone Management Program, Fairfax County Stormwater Planning Division, Keep Virginia Beautiful, Lynnhaven River NOW, Prince William County Public Works Department, Prince William Soil and Water Conservation District, Virginia Green, Virginia Aquarium & Marine Science Center</p>
<p>Factor: Lack of outreach to the public (Knowledge/Information)</p>	<p>Action 1.1.1.6.: By the end of 2022, explore the feasibility of a statewide unified litter prevention campaign based on social marketing principles.</p>	<p>Lead(s) and Partner(s): Keep Virginia Beautiful, Clean Virginia Waterways, Fairfax County Stormwater Planning Division, Prince William County Public Works Department, Prince William Soil and Water Conservation District, Virginia Aquarium & Marine Science Center, Virginia Green</p>
<p>Objective 1.1.2.: By the end of 2025, educate youth and adults through formal and non-formal education methods by using existing curricula and work with Mid-Atlantic partners in developing regionally-specific educational materials, art exhibits, resources, and professional learning opportunities.</p>		
<p>Factor: Lack of educational opportunities (Knowledge/Information)</p>	<p>Action 1.1.2.1.: By the end of 2025, share educational materials that have been successfully demonstrated through online platforms, in-person events, educator workshops, school programs and visits, summer camps, informal educational venues, and field trips with at least 100 educators and 4,000 preschool through twelfth grade (P-12) Virginia students, and make them available online for diverse audiences through the Virginia Plastic Pollution Prevention Network and other platforms.</p>	<p>Lead(s) and Partner(s): Keep Virginia Beautiful, Clean Virginia Waterways, Clean Fairfax, Elizabeth River Project, Fairfax County Stormwater Planning Division, Lynnhaven River NOW, National Park Service, Ocean Conservancy, Virginia Sea Grant, Virginia Aquarium & Marine Science Center, Virginia Plastic Pollution Prevention Network</p>

<p>Factor: Lack of sharing of professional opportunities (Knowledge/ Information)</p>	<p>Action 1.1.2.2.: Each year, share workforce, training, and professional opportunities, such as internships and educational programs, with at least 20 high schools and universities across the region, including schools in underserved and underrepresented communities.</p> <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 1.1.2.2.</i></p>	<p>Lead(s) and Partner(s): Keep Virginia Beautiful, Clean Virginia Waterways in collaboration with the Virginia Coastal Zone Management Program, Elizabeth River Project, Lynnhaven River NOW, Virginia Plastic Pollution Prevention Network</p>
--	---	---

Objective 1.1.3.: By the end of 2025, identify and promote industry partnerships in the supply chain and production operations to promote reusable systems and extended producer responsibility in sectors such as food service, hotels, tourism, retail, manufacturing, and wholesale.

<p>Factor: Lack of collaborative research initiatives (Knowledge/ Information)</p>	<p>Action 1.1.3.1.: Support systemic waste-source reduction research and campaigns, including investigations of reusable, biodegradable, alternative packaging, and innovative product design for commonly littered items.</p>	<p>Lead(s) and Partner(s): Clean Virginia Waterways in collaboration with the Virginia Coastal Zone Management Program, Keep Virginia Beautiful, Lynnhaven River NOW, Virginia Department of Environmental Quality's Office of Pollution Prevention, Virginia Green</p>
---	--	--

<p>Factor: Lack of composting facilities creating a barrier to alternatives to plastic packaging and single use plastic (Knowledge/ Information)</p>	<p>Action 1.1.3.2.: Research the feasibility of locating additional full-scale composting facilities (municipal or commercial) in Virginia equipped to receive and process compostable packaging and compostable food service items along with organic waste (yard trimmings, pre- and post-consumer food waste, compostable paper products and agricultural wastes).</p>	<p>Lead(s) and Partner(s): Clean Virginia Waterways in collaboration with the Virginia Coastal Zone Management Program, Lynnhaven River NOW, Virginia Aquarium & Marine Science Center, Virginia Department of Environmental Quality's Office of Pollution Prevention, Virginia Green, Virginia Plastic Pollution Prevention Network</p>
---	---	---

Strategy 1.2.: *Research and Monitoring*

Objective 1.2.1.: By the end of 2025, complete at least **one new research project** identifying opportunities, research gaps, data collection and monitoring efforts, and impacts of consumer debris.

<p>Factor: Need for data collection (Knowledge/ Information)</p>	<p>Action 1.2.1.1.: By the end of 2025, promote consumer debris research by promoting citizen science, conducting shoreline surveys, monitoring study sites, and collecting stormwater data to better inform decision-makers and raise public awareness.</p> <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 1.2.1.2.</i></p>	<p>Lead(s) and Partner(s): Clean Virginia Waterways in collaboration with the Virginia Coastal Zone Management Program, Center for Coastal Resources Management (CCRM)/VIMS, Clean Fairfax, Elizabeth River Project, Fairfax County Stormwater Planning Division, Keep Prince William Beautiful, NOAA Marine Debris Program, Ocean Conservancy and the International Trash Trap Network, Prince William County Public Works Department, Prince William Soil and Water Conservation District</p>
---	---	--

<p>Factor: Insufficient knowledge about economic impacts of marine debris (Knowledge/Information)</p>	<p>Action 1.2.1.2.: Analyze ecological and economic impacts of litter and marine debris to Virginia's tourism revenue, recreational spending, property values, and economically important species.</p>	<p>Lead(s) and Partner(s): Clean Virginia Waterways in collaboration with the Virginia Coastal Zone Management Program (economic value of volunteer cleanups), George Mason University (other economic impacts)</p>
--	---	--

Objective 1.2.2.: By the end of 2025, conduct social science research project(s) related to consumer debris, such as the effectiveness and best practices of behavior change efforts, community-based social marketing efforts, and identifying target audiences for additional marine debris prevention interventions.

<p>Factor: Insufficient knowledge about the effectiveness of various community-based social marketing campaigns (Knowledge/Information)</p>	<p>Action 1.2.2.1.: By the end of 2025, assist Mid-Atlantic partners in analyzing the effectiveness of community-based social marketing techniques.</p> <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 1.2.2.1.</i></p>	<p>Lead(s) and Partner(s): Virginia Coastal Zone Management Program in collaboration with Clean Virginia Waterways, George Mason University, Keep Prince William Beautiful, Ocean Conservancy, Potomac Environmental Research and Education Center, Virginia Aquarium & Marine Science Center, Virginia Institute of Marine Science</p>
--	--	--

Strategy 1.3.: *Proper Disposal, Interception, and Infrastructure*

Objective 1.3.1.: By the end of 2025, promote and increase proper disposal, interception technologies, and sustainable disposal options of consumer debris by identifying hotspots, adequately maintaining and emptying disposal receptacles, providing job opportunities, and supporting public services.

<p>Factor: Need for evaluating and improving policies and ordinances (Resources/Authority)</p>	<p>Action 1.3.1.1.: By 2023, examine existing data as well as the effectiveness of existing local, state, and regional policies and ordinances and identify the need to create new or enhanced litter prevention plans including new or retrofitted stormwater systems to intercept plastic debris.</p> <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 1.3.1.4.</i></p>	<p>Lead(s) and Partner(s): Clean Virginia Waterways in collaboration with the Virginia Coastal Zone Management Program, Chesapeake Bay Foundation, Clean Fairfax, Fairfax County Stormwater Planning Division, Northern Virginia Regional Commission, Prince William County, Public Works Department, VABottleBill.org</p>
---	---	---

<p>Factor: Need for collaboration with stormwater managers (Tools/Skills)</p>	<p>Action 1.3.1.2.: Share effective trash interception practices, infrastructure improvements (e.g., trash traps) and litter and marine debris education resources with stormwater managers (in MS4 and non-MS4 permitted localities) to assist them as they address floatables and litter.</p>	<p>Lead(s) and Partner(s): Clean Virginia Waterways in collaboration with the Virginia Coastal Zone Management Program, Fairfax County Stormwater Planning Division, Northern Virginia Regional Commission, PlanRVA, Prince William County Public Works Department, VABottleBill.org</p>
--	--	---

<p>Factor: Need to increase enforcement (Resources/ Authority)</p>	<p>Action 1.3.1.3.: Expand knowledge about and compliance with the Virginia law requiring that trucks have covered loads to prevent any items in the vehicle from escaping.</p>	<p>Lead(s) and Partner(s): Clean Virginia Waterways in collaboration with the Virginia Coastal Zone Management Program, Keep Virginia Beautiful</p>
<p>Strategy 1.4.: Removal</p>		
<p>Objective 1.4.1.: By the end of 2025, support and coordinate removal clean-up efforts of consumer debris, mobilizing 20,000 people, to remove 800,000 pounds of debris on land, waterways, coasts, and our ocean.</p>		
<p>Factor: Need to engage citizens and stakeholders in clean-up efforts</p>	<p>Action 1.4.1.1.: Increase participation in, and the number of cleanup events that remove litter and marine debris. Encourage and coordinate data collection during cleanups.</p>	<p>Lead(s) and Partner(s): Clean Virginia Waterways, Chesapeake Bay Foundation, Elizabeth River Project, Keep Virginia Beautiful, Lynnhaven River NOW, Ocean Conservancy (quarterly posting on the VPPPN of cleanup data for Virginia), PlanRVA, Prince William Soil and Water Conservation District, Surfrider Virginia Chapter</p>
<p>Strategy 1.5.: Policy, Management, Legislation and Enforcement</p>		
<p>Objective 1.5.1.: Through statewide partners, work with the state legislature to pass statewide legislation (or legislation that enables local governments to implement local laws) that will lead to a reduction of litter and marine debris. Build awareness of existing policy options with local governments, and assist them to implement local policies and laws that will lead to a reduction in littering of consumer products.</p>		
<p>Factor: Need to increase local action to reduce litter (Resources/ Authority)</p>	<p>Action 1.5.1.1.: By 2023, work with local policy makers to implement a fee on single-use disposable plastic bags in six or more counties or municipalities. This can include conducting pre- and post-bag fee litter surveys, outreach to businesses and citizens, clarifying outstanding questions with the Virginia Department of Taxation.</p>	<p>Lead(s) and Partner(s): Clean Virginia Waterways in collaboration with the Virginia Coastal Zone Management Program, Chesapeake Bay Foundation, Clean Fairfax, LitterFreeVA.org, Lynnhaven River NOW, Virginia Aquarium & Marine Science Center, Virginia Coastal Alliance</p>
<p>Factor: Need to evaluate effectiveness of local action to reduce litter</p>	<p>Action 1.5.1.2.: By 2024, examine the success of local governments' implementation of fees on single-use disposable plastic bags. Determine if a statewide fee (or a hybrid ban/fee approach) would be more successful in decreasing single-use bag litter and would be more attractive to grocery store chains.</p>	<p>Lead(s) and Partner(s): Clean Virginia Waterways in collaboration with the Virginia Coastal Zone Management Program, Chesapeake Bay Foundation, Clean Fairfax, LitterFreeVA.org, Lynnhaven River NOW, Virginia Coastal Alliance</p>

<p>Factor: Need to increase enforcement of Virginia's current litter laws (Resources/Authority)</p>	<p>Action 1.5.1.3.: Support increased enforcement of Virginia's current laws regarding littering, illegal dumping, balloon releases, waste management, stormwater runoff, and expanded polystyrene (EPS) phase out. Included in this: provide resources to restaurants and all food vendors to ensure successful implementation of the EPS ban. Also assist state universities and state agencies as they develop Plastic Pollution Reduction Plans to eliminate all non-medical single-use plastic and EPS objects, and replace them with reusable, compostable or recyclable items (a requirement of EO 77).</p>	<p>Lead(s) and Partner(s): Clean Virginia Waterways in collaboration with the Virginia Coastal Zone Management Program, Chesapeake Bay Foundation, Clean Fairfax, LitterFreeVA</p>
<p>Factor: Need for state policies on litter mitigation (Resources/ Authority)</p>	<p>Action 1.5.1.4.: By the end of 2025, inform the development of at least five (5) new local and state policies, ordinances, and management plans that are aimed at source reduction, prevention, and interception practices using available data and information. This could include:</p> <ul style="list-style-type: none"> • Local ordinances regarding dumpster management and hauling • Local ordinances on bulk trash disposal options • Implementation of 5-cent fees on single-use plastic bags • Statewide bottle bill • Extended producer responsibility laws • Local governments and private colleges' adoption of EO 77 actions to reduce their use of single-use plastics • Adoption of policies and laws to reduce specific forms of marine debris <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 1.5.1.2.</i></p>	<p>Lead(s) and Partner(s): Clean Virginia Waterways in collaboration with the Virginia Coastal Zone Management Program, Chesapeake Bay Commission Virginia Delegation, Chesapeake Bay Foundation, Clean Fairfax, LitterFreeVA.org, Lynnhaven River NOW, Northern Virginia Regional Commission, Oceana, Prince William County Public Works Department, VABottleBill.org, Virginia Department of Environmental Quality's Office of Pollution Prevention</p>
<p>Factor: Demand for collaboration on policies (Resources/ Authority)</p>	<p>Action 1.5.1.5.: Assist implementation of the policy recommendations of the Virginia Plastic Waste Prevention Advisory Council (named in May 2021)</p>	<p>Lead(s) and Partner(s): Clean Virginia Waterways in collaboration with the Virginia Coastal Zone Management Program, Clean Fairfax, Elizabeth River Project, LitterFreeVA.org, Lynnhaven River NOW, Virginia Department of Environmental Quality's Office of Pollution Prevention, Virginia Plastic Pollution Prevention Network</p>



Derelict Fishing and Aquaculture-related Gear

Derelict fishing gear is any discarded, lost, or abandoned, fishing gear in the environment. It includes traps and crab pots; fishing line, hooks and weights; fishing nets; nets that cover clams in aquaculture operations; and oyster aquaculture equipment. It is sometimes referred to as “ghost gear,” since fishing gear continues to fish and trap animals, entangle and potentially kill marine life. In addition, it can smother habitat, and act as a hazard to navigation.

Specific derelict fishing gear issues in Virginia include:

- Fishing line
 - Monofilament/nylon (recyclable)
 - Fluorocarbon (recyclable)
 - Braided high performance line (non-recyclable)
- Crab pots (commercial and recreational)
- Whelk pots
- Nets (pound nets, gill nets, clam nets)

Goal 2: Understand, Prevent, and Mitigate the Impacts of Derelict Fishing and Aquaculture-related Gear

Derelict Fishing Gear (DFG) refers to nets, monofilament and braided fishing lines, crab pots, aquaculture nets and equipment, and other recreational or commercial fishing or aquaculture equipment that has been lost, abandoned, or discarded in the marine or coastal environment. Modern gear is generally made of synthetic materials and metal, and can persist for a very long time. Lost gear also can contribute to the issue of ghost fishing, collecting both target species and nontarget bycatch.

Goal Performance Metric: Reduction in derelict fishing gear, ghost fishing, habitat loss, and navigation threats.

Strategy 2.1.: Prevention, Behavior Change, Education, Outreach

Objective 2.1.1: By the end of 2025, create and promote outreach products and information campaign projects with targeted messaging to reach members of recreational and commercial fishing communities to reduce derelict fishing gear, reduce ghost fishing, habitat loss, and threats to navigation.

<p>Factor: Lack of outreach to the public; lack of innovative practices and behaviors (Knowledge/ Information)</p>	<p>Action 2.1.1.1.: By the end of 2025, engage commercial and recreational fishers, crabbers, boaters, recreational charter boats, the public and others to identify, prioritize, research and promote at least three (3) new outreach products to prevent derelict gear. These products can include the adoption of behavior change, innovative practices or gear including bycatch reduction devices. Assist the Mid-Atlantic MDAP partners where appropriate.</p> <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 2.1.1.1.</i></p>	<p>Lead(s) and Partner(s): Clean Virginia Waterways in collaboration with the Virginia Coastal Zone Management Program, Center for Coastal Resource Management/ Virginia Institute of Marine Science, Ocean Conservancy</p>
<p>Factor: Lack of knowledge in boating community regarding avoiding fishing gear (Knowledge/ Information)</p>	<p>Action 2.1.1.2.: By the end of 2025, develop and disseminate instructional information to boaters about avoiding interaction with nets and pots. Investigate adding these messages to the mandatory boater safety courses.</p>	<p>Lead(s) and Partner(s): Lynnhaven River NOW, BoatUS Foundation, Virginia Marine Resources Commission</p>
<p>Factor: Need for engagement of watermen on new technologies (Tools/Skills)</p>	<p>Action 2.1.1.3.: By the end of 2025, implement two (2) new projects (possibly including economic incentives) to partner with fishers (commercial and recreational) to use innovative or proven technologies, programs, practices, or policies to prevent and remove derelict fishing gear in coastal and marine environments.</p> <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 2.2.2.1</i></p>	<p>Lead(s) and Partner(s): Virginia Institute of Marine Science</p>

<p>Factor: Insufficient outreach on proper disposal of braided line, monofilament line and soft bait (Knowledge/Information)</p>	<p>Action 2.1.1.4.: By the end of 2025, develop and share at least two (2) new outreach products on proper disposal and recycling of monofilament, braided, and fluorocarbon fishing lines to fishers, boaters, and the general public as well as build at least two new private partnerships on recycling monofilament line and soft bait (soft, flexible plastic lures usually made of polyvinyl chloride (PVC).</p> <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 2.1.1.3.</i></p>	<p>Lead(s) and Partner(s): Clean Virginia Waterways in collaboration with the Virginia Coastal Zone Management Program, Boat US Foundation, Keep It Beachy Clean, Virginia Aquarium & Marine Science Center, Virginia Beach Public Works</p>
<p>Factor: Lack of outreach to aquaculture industry (Knowledge/Information)</p>	<p>Action 2.1.1.5.: By the end of 2025, engage with clam and oyster aquaculture organizations to better understand the threat of gear loss due to storms and improve Best Management Practices (BMPs) for storm preparedness.</p> <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 2.1.1.5.</i></p>	<p>Lead(s) and Partner(s): Clean Virginia Waterways in collaboration with the Virginia Coastal Zone Management Program, Virginia Shellfish Growers Association</p>
<p>Factor: Lack of knowledge about alternative netting for aquaculture industry (Knowledge/Information)</p>	<p>Action 2.1.1.6.: By the end of 2023, engage with clam aquaculture organizations to find biodegradable alternatives to the polypropylene predator barrier nets used to protect clams.</p>	<p>Lead(s) and Partner(s): Virginia Coastal Zone Management Program in collaboration with Clean Virginia Waterways, Virginia Shellfish Growers Association</p>
<p>Strategy 2.2.: Research and Monitoring</p>		
<p>Objective 2.2.1.: Advance research and promote data collection, citizen science, and monitoring efforts on known derelict fishing gear hotspots and wildlife entanglement reports to identify key geographic areas to target removal and prevention efforts by the end of 2025.</p>		
<p>Factor: Lack of documentation of wildlife entanglements (Knowledge/Information)</p>	<p>Action 2.2.1.2.: In order to determine priorities for targeting prevention and removal strategies, develop or adapt existing methods to document wildlife entanglement and interactions with derelict fishing gear (commercial and recreational) and make them available on public-facing platforms.</p> <p>Monitor the effectiveness of fishing line collection bins.</p> <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 2.2.1.2.</i></p>	<p>Lead(s) and Partner(s): Ocean Conservancy, Virginia Aquarium & Marine Science Center, Virginia Coastal Zone Management Program</p>

Objective 2.2.2.: Identify barriers and explore development of innovative technologies, bycatch reduction devices, and other remote sensing alternatives to detect and prevent derelict fishing gear each year of the Plan.

<p>Factor: Lack of utilization of bycatch reduction devices (Tools/Skills)</p>	<p>Action 2.2.2.1.: By the end of 2025, monitor the effectiveness of bycatch reduction devices to prevent ghost fishing to recreational and commercial industries.</p> <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 2.2.2.2.</i></p>	<p>Lead(s) and Partner(s): Center for Resource Management/Virginia Institute of Marine Science, Chesapeake Bay Foundation, Virginia Coastal Policy Center at William & Mary Law School</p>
---	---	---

Strategy 2.3.: *Proper Disposal and Infrastructure*

Objective 2.3.1.: Promote proper disposal and increase infrastructure and capacity to collect end-of-life or derelict fishing gear in both the commercial and recreational sectors each year of the Plan.

<p>Factor: Lack of monofilament collection bins (Resources/Authority)</p>	<p>Action 2.3.1.1.: By the end of 2025, through commitments from local partners, install and maintain at least 25 fishing line collection bins at priority locations including signage in English and non-English languages.</p> <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 2.3.1.1.</i></p>	<p>Lead(s) and Partner(s): City of Virginia Beach, Clean Virginia Waterways (Keep It Beachy Clean Program), Lynnhaven River NOW, Elizabeth River Project, Virginia Marine Resources Commission</p>
--	---	---

<p>Factor: Lack of availability of recycling options (Resources/Authority)</p>	<p>Action 2.3.1.2.: By 2023, work with clam aquaculture companies to investigate the economic feasibility of recycling used clam netting rather than landfilling it and/or changing the material used to increase recyclability.</p>	<p>Lead(s) and Partner(s): Chesapeake Bay Foundation, Clean Virginia Waterways, Virginia Department of Conservation and Recreation Natural Heritage Division, Virginia Marine Resources Commission, Virginia Secretary of Natural and Historic Resources, The Nature Conservancy, Virginia Institute of Marine Science, Virginia Coastal Zone Management Program, Virginia Shellfish Growers Association</p>
---	--	---

<p>Factor: Lack of availability of proper disposal options (Resources/Authority)</p>	<p>Action 2.3.1.3.: By 2023, develop a pilot program with crabbers to recycle or repurpose old crab pots (crushed, flattened or turned into oyster reefs).</p>	<p>Lead(s) and Partner(s): Lynnhaven River NOW, Virginia Commonwealth University, Clean Virginia Waterways</p>
---	--	---

Strategy 2.4.: Removal

Objective 2.4.1.: Remove derelict fishing gear from coastal areas and waterways through innovative technology, remote sensing, and engagement with recreational, commercial, and aquaculture communities each year of the Plan.

<p>Factor: Lack of removal of derelict fishing gear by public (Resources/Authority)</p>	<p>Action 2.4.1.1.: By the end of 2025, support removal of derelict fishing gear (where allowed by law) in collaboration with recreational fishing and boating communities and employ alternative disposal options (recycling, return to owner, repurposing) when possible.</p> <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 2.4.1.1.</i></p>	<p>Lead(s) and Partner(s): Virginia Coastal Zone Management Program, Virginia Marine Resources Commission, Virginia Shellfish Growers Association, Clean Virginia Waterways, Virginia Institute of Marine Science, Virginia Department of Conservation and Recreation Natural Heritage Division, Lynnhaven River Now, NOAA Marine Debris Program, Ocean Conservancy</p>
<p>Factor: Lack of removal programs (Resources/Authority)</p>	<p>Action 2.4.1.2.: By the end of 2025, support at least three (3) projects working alongside commercial fishing to remove derelict traps and pots in off-seasons when feasible.</p> <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 2.4.1.2.</i></p>	<p>Lead(s) and Partner(s): Center for Coastal Resource Management/Virginia Institute of Marine Science</p>
<p>Factor: Lack of removal programs (Resources/Authority)</p>	<p>Action 2.4.1.3.: Every year of the Plan, work alongside aquaculture companies to remove clam netting from barrier islands and shorelines (when damage will not be caused to tiger beetles and beach-nesting birds.) Increase knowledge about the willingness of clam growers to remove clam netting from shorelines when reported.</p>	<p>Lead(s) and Partner(s): Virginia Coastal Zone Management Program, Virginia Marine Resources Commission, Virginia Shellfish Growers Association, Clean Virginia Waterways, Virginia Institute of Marine Science, Virginia Department of Conservation and Recreation Natural Heritage Division, Lynnhaven River Now, Ocean Conservancy, Chesapeake Bay Foundation, The Nature Conservancy</p>
<p>Factor: Lack of removal of derelict fishing line (Resources/ Authority)</p>	<p>Action 2.4.1.4.: Every year of the Plan, work alongside pier owners/ managers and organizers of volunteer clean-ups to remove fishing line from piers and shorelines.</p>	<p>Lead(s) and Partner(s): Boat US Foundation, Virginia Department of Wildlife Resources, Lynnhaven River Now, Virginia Marine Resources Commission, Virginia Aquarium & Marine Science Center, Clean Virginia Waterways</p>

Strategy 2.5.: Policy, Management, Legislation and Enforcement

Objective 2.5.1.: Each year of the Plan, engage with state and local government bodies, policy-makers, and decision-makers to raise awareness of the issue of derelict fishing gear and build support for sustained programs and funding to prevent, mitigate, and remove derelict fishing gear.

Factor: Lack of a comprehensive database of laws and regulations (Knowledge/Information)	Action 2.5.1.1.: By the end of 2025, create and maintain an online database of existing laws and regulations, bycatch reduction policies, and available research regarding derelict fishing gear to be updated annually.	Lead(s) and Partner(s) Center for Coastal Resource Management/Virginia Institute of Marine Science
Factor: Lack of comprehensive policy on collection & recycling of fishing line (Resources/Authority)	Action 2.5.1.2.: By the end of 2025, incentivize harbor masters, marinas, fishing piers, and managers of public docks and reservoirs to have a policy in place to collect and recycle monofilament and fluorocarbon fishing lines . Also collect braided fishing line for correct disposal.	Lead(s) and Partner(s) Boat US Foundation, Clean Virginia Waterways in collaboration with the Virginia Coastal Zone Management Program, Virginia Marine Resources Commission, Virginia Aquarium & Marine Science Center



Microplastics and Microfibers

NOAA defines microplastics as any piece of plastic smaller than 5 mm in the largest dimension. Some microplastics in the ocean come from fragmentation of larger pieces of plastic – for example, one plastic bottle can be transformed into hundreds of shards of microplastic over time. Other sources of microplastics are polyethylene and polypropylene “microbeads” that are found in personal care products such as self-tanning lotions, makeup and toothpaste. When rinsed down the drain, they travel through the sewer system, where they often pass through waste treatment plants and enter streams, rivers and eventually the marine environment or freshwater lakes. Microfibers from polyester, rayon, nylon and other synthetic materials come off of clothing, rope, and even disposable face masks.

There is evidence that many species, including fish, ingest microplastic debris⁽¹⁷⁾. Also, hazardous chemical contaminants found in the water sorb (attach) to the tiny pieces of plastic. Research is underway to understand the rate at which chemicals can transfer from ingested plastics to animals, and what bioaccumulation and biomagnification implications these chemicals may present to aquatic food webs and ultimately humans.

Attention to microplastics and microfibers has increased since the first Plan was published in 2014; it is now a major Goal of the updated Plan. According to a paper by Robert Hale of the Virginia Institute of Marine Science and others in the January 2020 *Journal of Geophysical Research* “...the amount of microplastics in some oceanic compartments is predicted to double by 2030.”

Goal 3: Understand, Prevent, and Mitigate the Impacts of Microplastics and Microfibers

Microplastics are small plastic particles less than five millimeters in size. They include microbeads, pellets, or small fragments from larger plastic items breaking up in the marine environment. Microfibers can be synthetic fibers, such as polyester or nylon, which are used to make clothing, furnishings, fishing nets, roping, and fishing lines. Through general wear or washing and drying, fibers may break apart from larger items.

Goal Performance Metric: Increased understanding and prevention of microplastic and microfibers as marine debris.

Strategy 3.1.: Prevention, Behavior Change, Education, Outreach

Objective 3.1.1.: By the end of 2025, develop education and outreach materials with coordinated messaging on microplastics and microfibers to raise public awareness of available science, data collection, research, laws, and regulations as steps leading to long-term changes to behavior.

<p>Factor: Lack of outreach products and education campaigns (Knowledge/Information)</p>	<p>3.1.1.1.: By the end of 2025, work with Mid-Atlantic partners to create and implement at least three (3) outreach products and/or education campaigns to 1) raise awareness of microplastic and microfiber and 2) convey information on how to reduce microplastics and microfibers through personal choices in clothing purchases, and 3) inform people how to remove microfibers how to remove microfibers from washers and dryers. Make the campaign materials available on the Virginia Plastic Pollution Prevention Network and other platforms.</p> <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 3.1.1.1.</i></p>	<p>Lead(s) and Partner(s): George Mason University, Keep Virginia Beautiful, Lynnhaven River Now, Virginia Coastal Zone Management Program, Virginia Plastic Pollution Prevention Network</p>
<p>Factor: Lack of crowdsourcing information and resources among educators (Knowledge/Information)</p>	<p>3.1.1.2.: By the end of 2025, share existing or new microplastics and microfibers lesson plans, educator workshops, field activities, and/or materials with 2,000 K-12 students and 50 educators, and update resources on the Virginia Plastic Pollution Prevention Network.</p> <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 3.1.1.2.</i></p>	<p>Lead(s) and Partner(s) Lynnhaven River Now</p>
<p>Factor: Need to increase leadership in the next generation (Knowledge/Information)</p>	<p>3.1.1.3. By the end of 2025, complete an education, prevention, and outreach project for undergraduate and graduate university students to build the capacity of next-generation leaders.</p> <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 3.1.1.3.</i></p>	<p>Lead(s) and Partner(s): Virginia Universities</p>

Objective 3.1.2.: By the end of 2025, identify industry partnerships and pilot projects to promote opportunities in the supply chain and operations to reduce the generation of microplastics or microfibers, such as in the clothing industry, manufacturing, and wholesaling.

<p>Factor: Need to transcend industry boundaries to reduce microplastics</p>	<p>Action 3.1.2.1.: By the end of 2025, raise awareness about product materials with fashion design programs in Virginia’s universities and small retail businesses to influence purchasing decisions that will lead to a reduction in plastic microfibers.</p>	<p>Lead(s) and Partner(s): To be determined</p>
---	--	--

Strategy 3.2.: *Research and Monitoring*

Objective 3.2.1.: By the end of 2025, identify and address research opportunities through data collection, monitoring, and detection of microplastics and microfibers.

<p>Factor: Lack of sharing data on microplastics (Knowledge/Information)</p>	<p>Action 3.2.1.1.: By the end of 2025, conduct at least one (1) microplastic and microfiber research webinar to share data and detection strategies and to discuss best practices to promote future research in the region.</p> <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 3.2.1.2.</i></p>	<p>Lead(s) and Partner(s): Northern Virginia Regional Commission, Virginia Institute of Marine Science</p>
<p>Factor: Need for further research on microfibers, their environmental impacts, and substitutions (Knowledge/Information)</p>	<p>Action 3.2.1.2.: By the end of 2025, complete at least three (3) research projects that address an information gap including but not limited to: studies on pathways, measurement and sampling techniques, quantification, fate and transport, modeling, chemical and physical traits, impacts to wildlife and human health, vectors for invasive species, removal of microfibers from wastewater, and best substitutions for synthetic materials. Determine if all synthetic and semi-synthetic microfibers present problems. Include emerging sources of microplastics:</p> <ul style="list-style-type: none"> • Tires • Paints and removal of paint • Polystyrene building construction (for facades and insulation) • Landscape netting and cloth • Weed wacker line • Silt fencing • Plastic sheeting used in agriculture • Plastic mesh used for shoreline erosion control <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 3.2.1.3.</i></p>	<p>Lead(s) and Partner(s): Virginia Institute of Marine Science, NOAA Marine Debris Program, George Mason University</p>

<p>Factor: Need to identify gaps in knowledge among public utilities concerning microplastics (Knowledge/Information)</p>	<p>Action 3.2.1.3.: By 2023, conduct a survey of public utilities (drinking water testing and wastewater treatment plants [WWTP]) to learn their level of concern about microplastics, whether they are able to monitor amounts of microplastics and what resources or knowledge they need.</p>	<p>Lead(s) and Partner(s): Chesapeake Bay Program</p>
<p>Factor: Lack of information on the presence of microplastics in biosolids (Knowledge/Information)</p>	<p>Action 3.2.1.4.: By 2024, conduct research on the presence of microplastics in biosolids (sludge from WWTP) that are approved for application on Virginia’s farmlands.</p>	<p>Lead(s) and Partner(s): George Mason University, Virginia Institute of Marine Science</p>
<p>Factor: Need for regular microplastic testing in water quality monitoring efforts (Knowledge/Tools)</p>	<p>Action 3.2.1.5.: As the ability to detect microplastics and fibers increases, and standardized protocols are put in place, determine if existing Water Quality Monitoring Program volunteers could pull samples for testing of microplastics and fibers.</p>	<p>Lead(s) and Partner(s): Alliance for Chesapeake Bay, Lynnhaven River Now, Virginia Water Monitoring Council</p>
<p>Factor: Lack of knowledge on cost-benefit analysis for remediation and innovative technologies to reduce microfibers and microplastics (Tools/Skills)</p>	<p>Action 3.2.1.6.: By the end of 2025, work with Mid-Atlantic partners to conduct at least one (1) study alongside academia, the private sector, and/or stormwater management agencies to collect observational data and analyze the cost-benefit for remediation, innovative technologies, and/or barriers to using intercept technologies to reduce microfibers and microplastics entering waterways.</p> <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 3.3.1.1.</i></p>	<p>Lead(s) and Partner(s): To be determined</p>
<p>Strategy 3.3.: Proper Disposal and Infrastructure</p>		
	<p>Objectives and Actions to be determined once more research is done.</p>	
<p>Strategy 3.4.: Removal</p>		
<p>Objective 3.4.1.: By the end of 2025, identify and distribute innovative technologies to capture and remove microfibers and microplastics from identified sources (washing machines, wastewater treatment plants, and water discharge hotspots).</p>		
<p>Factor: Need to make microfiber-reducing technologies available to the public (Tools/Skills)</p>	<p>Action 3.4.1.1.: By the end of 2025, identify and distribute innovative products and technology proven to be effective that can be used in consumer homes and in commercial laundry establishments, such as washing machine filters, to reduce microfiber entry into waterways.</p> <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 3.4.1.1.</i></p>	<p>Lead(s) and Partner(s): Ocean Conservancy</p>

Strategy 3.5.: Policy, Management, Legislation and Enforcement

Objective 3.5.1.: By the end of 2025, develop and share marine debris resources that communicate the impacts of microplastics and microfibers with policy and management officials and businesses to guide policy decisions, build political will, and cultivate champions.

<p>Factor: Lack of communication with local and state decision makers (Resources/ Authority)</p>	<p>Action 3.5.1.1. : By the end of 2025, engage in meaningful interactions with at least five local and state decision-makers to better understand possible policy and management considerations for microplastics and microfibers in waterways.</p> <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 3.5.1.1.</i></p>	<p>Lead(s) and Partner(s): Northern Virginia Regional Commission</p>
<p>Factor: Need for state action on microbeads (Authority)</p>	<p>Action 3.5.1.1.: Promote a new synthetic plastic microbead bill that fixes the problems with the Federal microplastic bill of 2015. The bill will define the term “synthetic plastic microbead” and prohibit the manufacture of certain personal care products.</p>	<p>Lead(s) and Partner(s): Chesapeake Bay Commission (Virginia Delegation)</p>



Billy Gibbs

Abandoned and Derelict Vessels

The Virginia Coastal Zone Management (CZM) Program and Clean Virginia Waterways, (CVW) in collaboration with the Coastal Policy Center at William & Mary Law School, initiated an Abandoned and Derelict Vessel Work Group with participation from the US Coast Guard, Navy, state agencies, local governments, coastal ports, vessel and marina owners, and other relevant community stakeholders. In a series of meetings, the Work Group strategized and will later make recommendations on actions that will help address abandoned and derelict vessels (ADV). The Virginia CZM Program and CVW developed a vessel inventory of abandoned and derelict vessels and will make recommendations to prioritize actions for future removal efforts. When completed, the ADV Work Group strategies and actions will be incorporated into the Plan.

Goal 4: Understand, Prevent and Mitigate the Impacts of Abandoned and Derelict Vessels

Abandoned and derelict vessels (ADV) are vessels in significant disrepair that may pose a threat to the public or the environment. “Derelict” frequently refers to vessels that are dilapidated with an identifiable owner, while “abandoned” vessels are those where the owner is unknown or has surrendered rights of ownership. ADVs often litter ports, waterways, marinas, and estuaries. They threaten our ocean, coasts, and waterways by obstructing navigational channels, causing harm to the environment, and diminishing commercial and recreational activities.

Goal Performance Metric: Increased prevention and removal of abandoned and derelict vessels from Virginia’s coastal and inland waters.

Strategy 4.1.: Prevention, Behavior Change, Education, Outreach

Objective 4.1.1.: By the end of 2025, share outreach, best practices, and educational materials to the boating community and relevant jurisdictions to address abandoned and derelict vessels.

<p>Factor: Lack of knowledge on the current process for removing ADVs in Virginia among stakeholders (Knowledge/Information)</p>	<p>Action 4.1.1.1.: By the end of 2022, educate boat owners, marina managers, law enforcement, local governments, and vessel towers on the current process and responsibilities for removal of ADVs in Virginia including the need to do due process in locating the last known registered owner of the vessel. Include information on responsible boat ownership, how to prepare a vessel for disposal (remove hazardous materials, etc.), and disposal options.</p>	<p>Lead(s) and Partner(s): Virginia Abandoned & Derelict Vessel Work Group <i>This work group is a project of the Virginia Coastal Zone Management Program and Clean Virginia Waterways. (See appendix for list of members.)</i></p>
<p>Factor: Insufficient knowledge about storm preparedness and recycling shrinkwrap boat covers (Knowledge/Information)</p>	<p>Action 4.1.1.2.: By the end of 2024, explore creation of a recycling program for shrinkwrap boat covers, and create outreach products, such as fact sheets and educational materials, highlighting best practices for proper disposal of shrinkwrap boat covers, reusable alternatives to single-use boat covers, and storm preparedness. Share with marinas, boating shops, boat shows, yacht clubs, and other relevant private sector entities.</p> <p><i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 4.1.1.1.</i></p>	<p>Lead(s) and Partner(s): Virginia Coastal Zone Management Program in collaboration with Clean Virginia Waterways, Virginia Institute of Marine Science, Virginia Clean Marina Program, BoatUS Foundation, Ocean Conservancy</p>

Strategy 4.2.: Research and Monitoring

Objective 4.2.1.: Identify hot spots for abandoned and derelict vessels in Virginia, promote data collection, and further implement a shared inventory of known vessel locations and hot spots.

<p>Factor: Need for an up-to-date database to keep inventory of known ADVs in Virginia (Tools/Skills)</p>	<p>Action 4.2.1.1.: Every year, engage marinas and the boating community in updating and sharing with relevant federal, state and local entities the inventory of known ADVs in Virginia. Update GIS-based inventory of vessels and prioritize removal based on criteria developed by the Work Group to improve navigational safety, minimize environmental harm, and maximize cost-savings through economies of scale (multiple vessel removal in a given location).</p>	<p>Lead(s) and Partner(s): Virginia Abandoned & Derelict Vessel Work Group</p>
--	---	---

Strategy 4.3: Proper Disposal and Infrastructure

Objective 4.3.1.: Increase proper disposal capacity and infrastructure for abandoned and derelict vessels, fiberglass, and vessel-related debris.

<p>Factor: Lack of vessel recycling options (Tools/Skills)</p>	<p>Action 4.3.1.1.: By the end of 2024, identify a fiberglass reuse option and other sustainable vessel disposal alternatives for ADV in Virginia. <i>This Action aligns with the Mid-Atlantic Marine Debris Action Plan Action 4.3.1.3.</i></p>	<p>Lead(s) and Partner(s): Virginia Abandoned & Derelict Vessel Work Group</p>
<p>Factor: Lack of recycling infrastructure for ADVs in Virginia (Tools/Skills)</p>	<p>Action 4.3.1.2.: Through the work of the Virginia Abandoned and Derelict Vessel Work Group, continue to build capacity within Virginia to prevent, remove, and dispose of ADVs.</p>	<p>Virginia Abandoned & Derelict Vessel Work Group</p>

Strategy 4.4.: Removal

Objective 4.4.1.: Remove abandoned and derelict vessels from the ocean, waterways, marinas, and coasts in coordination with relevant federal, state, and local jurisdictions and disseminate funding opportunities.

<p>Factor: Lack of funds for ADV removal and prevention (Resources/Authority)</p>	<p>Action 4.4.1.1.: By the end of 2023, secure funding to remove high priority ADVs from Virginia's coastal zone in conjunction with a pilot prevention program. This will also create a model that will assist with the creation of a Virginia ADV Program.</p>	<p>Lead(s) and Partner(s): Virginia Abandoned & Derelict Vessel Work Group</p>
--	--	---

Strategy 4.5.: Policy, Management, Legislation and Enforcement

Objective 4.5.1.: By the end of 2022, engage with federal, state and local agencies to explore abandoned and derelict vessel removal and prevention approaches, and craft policy and legal recommendations.

<p>Factor: Need for the creation and funding for a Virginia ADV Removal and Prevention Program (Resources/ Authority)</p>	<p>Action 4.5.1.1.: In advance of the January 2023 General Assembly session, based on the ADV White Paper by the Virginia Coastal Policy Center (fall 2021), and the recommendations from the Virginia ADV Work Group Report (fall 2021) provide specific legislation and policy suggestions to elected officials and policy makers to fund, create and staff a Virginia ADV Removal and Prevention Program. Allow for up to two sessions (2023 and 2024) of the General Assembly to pass all needed legislation.</p>	<p>Lead(s) and Partner(s): Virginia Abandoned & Derelict Vessel Work Group</p>
<p>Factor: Need for monitoring the Virginia ADV Removal and Prevention Program (Resources/Authority)</p>	<p>Action 4.5.1.3.: Provide continuing evaluation and direction of the Virginia ADV Removal and Prevention Program through input from stakeholders, and the creation of an ADV Advisory Council (method to be determined, e.g., executive order, etc.)</p>	<p>Lead(s) and Partner(s) To be determined</p>

REFERENCES

- (1) Virginia Coastal Zone Management Program. <https://www.deq.virginia.gov/coasts/about-czm>
- (2) Sheavly, S. B., & Register, K. M. (2007). Marine debris & plastics: environmental concerns, sources, impacts and solutions. *Journal of Polymers and the Environment*, 15(4), 301-305
- (3) Register, K., Trapani, C., Swingle, M. 2019. Monitoring Marine Debris in Virginia's Coastal Zone, Project Report: April 2014 through June 2018. NOAA CZM Grant NA16NOS4190171, Task 81. Virginia Aquarium & Marine Science Center Foundation Scientific Report 2019-03, Virginia Beach, Virginia, 80 pp
- (4) Lebreton, L., Andrady, A. Future scenarios of global plastic waste generation and disposal. *Palgrave Commun* 5, 6 (2019). <https://doi.org/10.1057/s41599-018-0212-7>
- (5) Geyer, R., Jambeck, J. R., & Law, K. L. (2017). Production, use, and fate of all plastics ever made. *Science Advances*, 3(7), e1700782.
- (6) Jambeck, J., Geyer, R., Wilcox, C., et al., Plastic waste inputs from land into the ocean. *Science* 347, 768-771 (2015). DOI: 10.1126/science.1260352
- (7) Bikker, J., Lawson, J., Wilson, S., & Rochman, C. M. (2020). Microplastics and other anthropogenic particles in the surface waters of the Chesapeake Bay. *Marine Pollution Bulletin*, 156, 111257.
- (8) Zheng, J., & Suh, S. (2019). Strategies to reduce the global carbon footprint of plastics. *Nature Climate Change*, 9(5), 374-378.
- (9) Coccia, R. (2020). Surfider. A Reality Check on Environmental Racism & Plastics. <https://www.surfrider.org/coastal-blog/entry/a-reality-check-on-environmental-racism-plastics>
- (10) Sheavly, S. B. (2007). National marine debris monitoring program. Final Program Report, Data Analysis and Summary. Prepared for US Environmental Protection Agency by Ocean Conservancy, Grant, (X830534)
- (11) Virginia Tax. Litter Tax. <https://www.tax.virginia.gov/litter-tax>
- (12) Virginia Litter Tax: <https://www.deq.virginia.gov/land-waste/litter-prevention> litter-tax; Litter Control and Recycling Fund (Section 10.1-1422.01); Litter Tax (Section 58.1-1707); Excise Tax on Soft Drinks (Section 58.1-1702); Excise Tax on Beer and Wine Coolers (Section 4.1-235 & 4.1-236)
- (13) Virginia Department of Environmental Quality. Litter Prevention and Recycling Grant Program. <https://www.deq.virginia.gov/land-waste/litter-prevention/grant-programs>
- (14) LitterFreeVA.org. Virginia Litter Tax. <https://litterfreeva.org/learn-the-facts/virginia-litter-tax/>
- (15) NOAA Marine Debris Program. The Mid-Atlantic Marine Debris Action Plan. (2021). <https://marinedebris.noaa.gov/regional-action-plan/mid-atlantic-marine-debris-action-plan>
- (16) Mid-Atlantic Marine Debris Collaborative website. <https://midatlantic-mdc.diver.orr.noaa.gov/>
- (17) Witmer, V., Register, K., McKay, L. (2017). Balloon Release Research in Virginia & Reducing Balloon Debris through Community-Based Social Marketing. Available on <http://www.longwood.edu/cleanva/publications.html>
- (18) Rochman, C., Hoh, E., Hentschel, B., & Kaye, S. (2013). Long-term field measurement of sorption of organic contaminants to five types of plastic pellets: implications for plastic marine debris. *Environmental science & technology*, 47(3), 1646-1654.



Photo credit: NOAA



Virginia Coastal Zone
MANAGEMENT PROGRAM

www.deq.virginia.gov/coasts/marine-debris



www.longwood.edu/cleanva/



<https://marinedebris.noaa.gov/>



**National
Marine Sanctuary
Foundation**

<https://marinesanctuary.org/>