OUR ELIZABETH

ELIZABETH RIVER
PROJECT

THE UPDATED STRATEGY FOR COMMUNITY-WIDE ACTION TO RESTORE THE ELIZABETH RIVER

Elizabeth Watershed Action Plan V · 2022

VISION

A beautiful and healthy Elizabeth River, abundant in diversity, accessible to all.

PURPOSE OF THE PLAN

To update the roadmap for community-wide partners, from governments to businesses, residents, scientists, students and non-profits, to continue one of the great urban river restorations of our time.

GUIDING PRINCIPLES

Achieve equity and environmental justice through all actions in this plan.

Take proactive steps to address sea level rise and a changing climate throughout this plan.

CRITERIA FOR ACTION

Effective,
equitable,
fundable.

INDEX

(Interactive)

ABOUT THE PLAN

This plan is presented by the non-profit Elizabeth River Project in its mission to restore the environmental quality of the Elizabeth River through residential, government and business partnerships. The plan represents the consensus recommendations of a large group of stakeholders from all walks of life, Watershed Action Team 2021. About every six years since 1996, Elizabeth River Project has convened such a group to set the next priorities and action steps for all sectors and partners - not just the Elizabeth River Project - to continue progress with restoring a healthy Elizabeth; an urban river once presumed dead.

Today most major industries lining the shore are among 140 organizations - including government agencies, universities, non-profits and businesses - voluntarily documenting pollution prevention and wildlife habitat achievements as “River Star Businesses” with Elizabeth River Project. Meanwhile, more than 6,100 residents carry out 7 steps as “River Star Homes.” And thousands of students participate each year as “Resilient River Star Schools.”

Returning dolphins, river otters, bald eagles and seahorses are harbingers of success so far.

Find your starring role. Be part of the momentum of this fifth plan update.

This plan was made possible by an Innovative Nutrient & Sediment Reduction Grant from the National Fish & Wildlife Foundation, with funding from the U.S. Environmental Protection Agency, the Altria Group and other generous supporters of the Elizabeth River Project. The Environmental Finance Center at the University of Maryland researched opportunities for financing regional environmental needs. The University of Virginia’s Institute for Engagement and Negotiation provided planning facilitation.

This material is based on work supported by the U.S. Environmental Protection Agency and the Chesapeake Bay Program’s Innovative Nutrient and Sediment Reduction grants program, which supports efforts with the Chesapeake Bay watershed to accelerate nutrient and sediment reductions with innovative, sustainable, and cost-effective approaches. The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the opinions or policies of the U.S. Government or the National Fish and Wildlife Foundation and its founding sources. Mention of trade names or commercial products does not constitute their endorsement by the U.S. Government, or by the National Fish and Wildlife Foundation or its funding sources.

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Spring 2022

ELIZABETH RIVER
PROJECT

INTRODUCTION
A river for all the people

Of the five plans we have spearheaded for the Elizabeth River across the last 25 years, this feels most like the first one, and that's a good thing.

The first plan for the Elizabeth brought old men to tears. I saw them and heard the standing ovation that went on and on. The setting was Nauticus, brand new then, in 1996, in the auditorium with the huge screen that rolls back to show the Elizabeth beyond. A staged sailboat floated past with a banner, "Making restoration a reality."

There was such power in that plan. The river's disparate interests - regulators, ship repairers, the port, watermen, environmentalists and more - had never before agreed on a common path to reclaim the health of their infamous waterway.

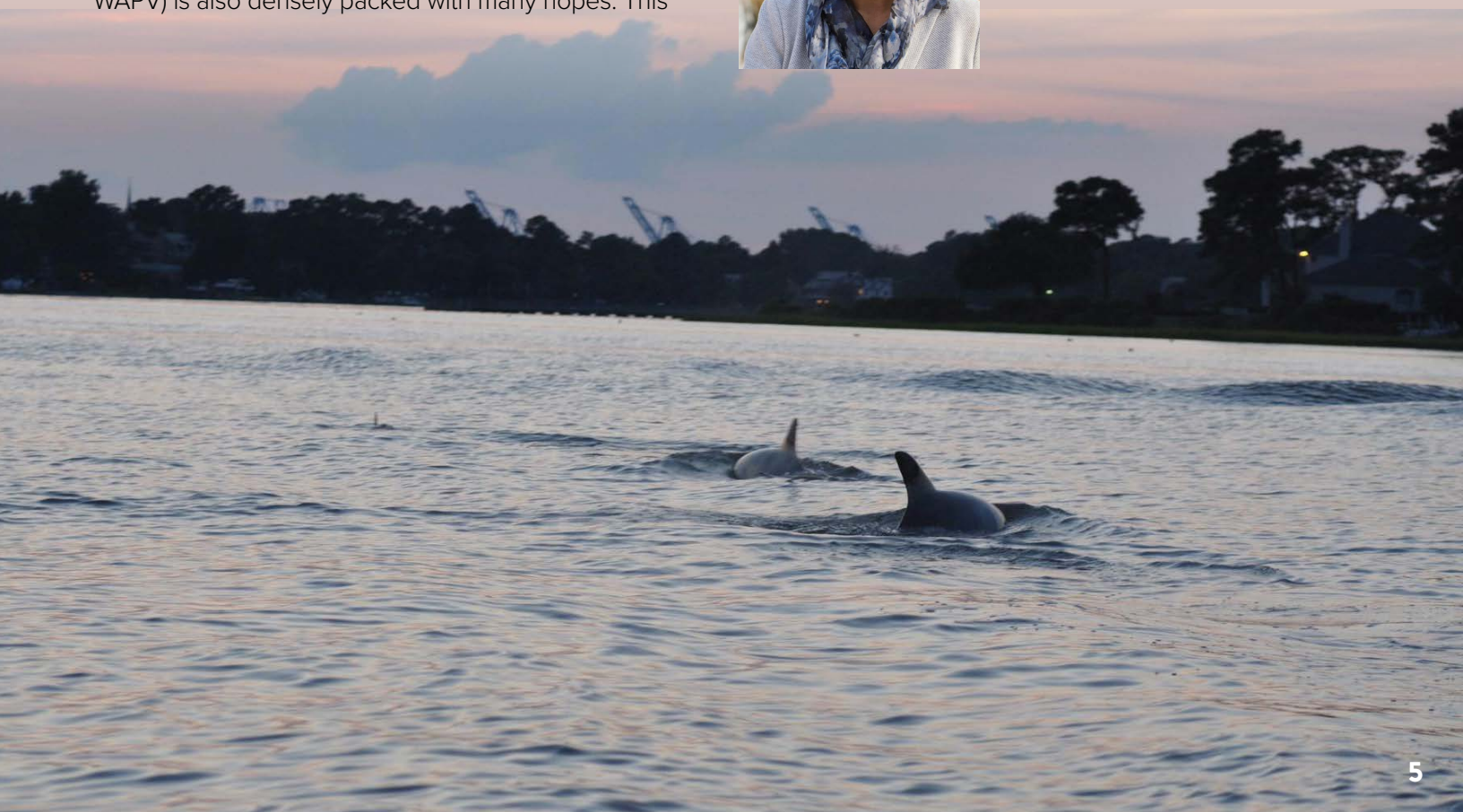
There was so much commitment to that first plan, on behalf of the original Watershed Action Team of 120 from all walks of life, they refused to prioritize any area as more important than another. Though we published a shorter "Executive Summary," the real plan was densely packed with so many hopes.

This 2022 version (See full plan at ElizabethRiver.org/WAPV) is also densely packed with many hopes. This time, the power comes in part from confidence, with so much that has been achieved already. Half the hotspots, once so daunting, have been cleaned up. Dolphins are common in all branches. Industries, schools, government and residents readily help as "River Stars."

With that confidence comes the real power of this plan: Its commitments, new this go around, to raise up all the people to have fair access to the river, and to reduce unfair pollution burdens. Its heightened commitment to take on the existential challenge of our region and our times, climate change and sea level rise.

Thank you, Watershed Action Team 2021, a team of 150 who met doggedly throughout the year despite virtual meetings and COVID. At Elizabeth River Project, we have always believed this urban river would be cleaned up most effectively through collaboration. You have given that model its fullest expression.

Marjorie Mayfield Jackson,
Executive Director,
Elizabeth River Project



THE ELIZABETH RIVER

ELIZABETH RIVER PROJECT

State of the River 2020

Main Stem	B
Lafayette	C
Eastern Branch	C
Southern Branch	C
Western Branch	C

SUMMARY

ACTION 1

ACHIEVE FAIR AND EQUITABLE RESTORATION
of the Elizabeth River, reducing unfair pollution burdens and advancing community-wide engagement.

ACTION 2

COLLABORATE REGIONALLY TO BECOME A MODEL FOR RESILIENCE
to rising seas and a changing climate. Support this with strong research, examples and policies.

ACTION 3

RESTORE CLEAN WATER.
Reduce nutrients, chemicals and harmful bacteria and improve water clarity in the river, with a focus on reducing pollution in under-served communities and those vulnerable to rising seas.

ACTION 4

CREATE AN INCLUSIVE RIVER REVOLUTION
led by people of all ages and walks of life who understand, embrace and promote the restoration of the Elizabeth.

ACTION 5

THE GOO MUST GO!
Clean up contamination in the river bottom while also reducing PCBs in fish.

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ACTION 6

CREATE AND PROTECT HEALTHY WILDLIFE HABITAT,
despite rising sea levels.

ACTION 1

ACHIEVE FAIR AND EQUITABLE RESTORATION OF THE ELIZABETH RIVER, reducing unfair pollution burdens and advancing community-wide engagement.

LOOK FOR THIS ICON for goals and actions related to environmental justice and equity. This action is achieved by integrating equity and environmental justice approaches into all areas of the plan.

Photo by TIME Magazine/ Matt Eich

If the bird cries, we answer.
If the fish gasps, we answer.
If the tree falls, we mourn.
Why not our fellow man?

- Casey Shaw,
Elizabeth River Watershed Action Team 2021

BACKGROUND - EQUAL ACCESS TO THE BEAUTY

The year our wide harbor was named the Elizabeth, for a British Princess who never actually visited, was the same year, 1619, that the first slaves arrived on American soil, in Hampton, VA., just a few miles north of the Elizabeth River.

You wouldn't know it from the traditional history books of our region, but this waterway has played as much of a role in the fate of African Americans as it has as the cradle of modern shipbuilding and repair.

As some conditions along the Elizabeth get better - oyster and wetland habitats are restored; eagles and dolphins return - and some get worse; with sea level rise and a changing climate bringing toxic flooding, the Elizabeth River Project's Watershed Action Team 2021 gives top priority to achieving more equitable river restoration and community engagement. Some communities should not have better access than others to the beauty and bounty of our home river returning to life. Neither should under-resourced communities bear an unfair share of pollution and flooding.

The US Environmental Protection Agency defines "environmental justice" as **the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.** To support this plan, the Virginia Institute of Marine Science (VIMS) developed a new, multi-layered on-line map, the **Elizabeth River Environmental Justice Mapping Tool.** Throughout this plan, actions reference the map for where priority focus is needed to achieve environmental justice.

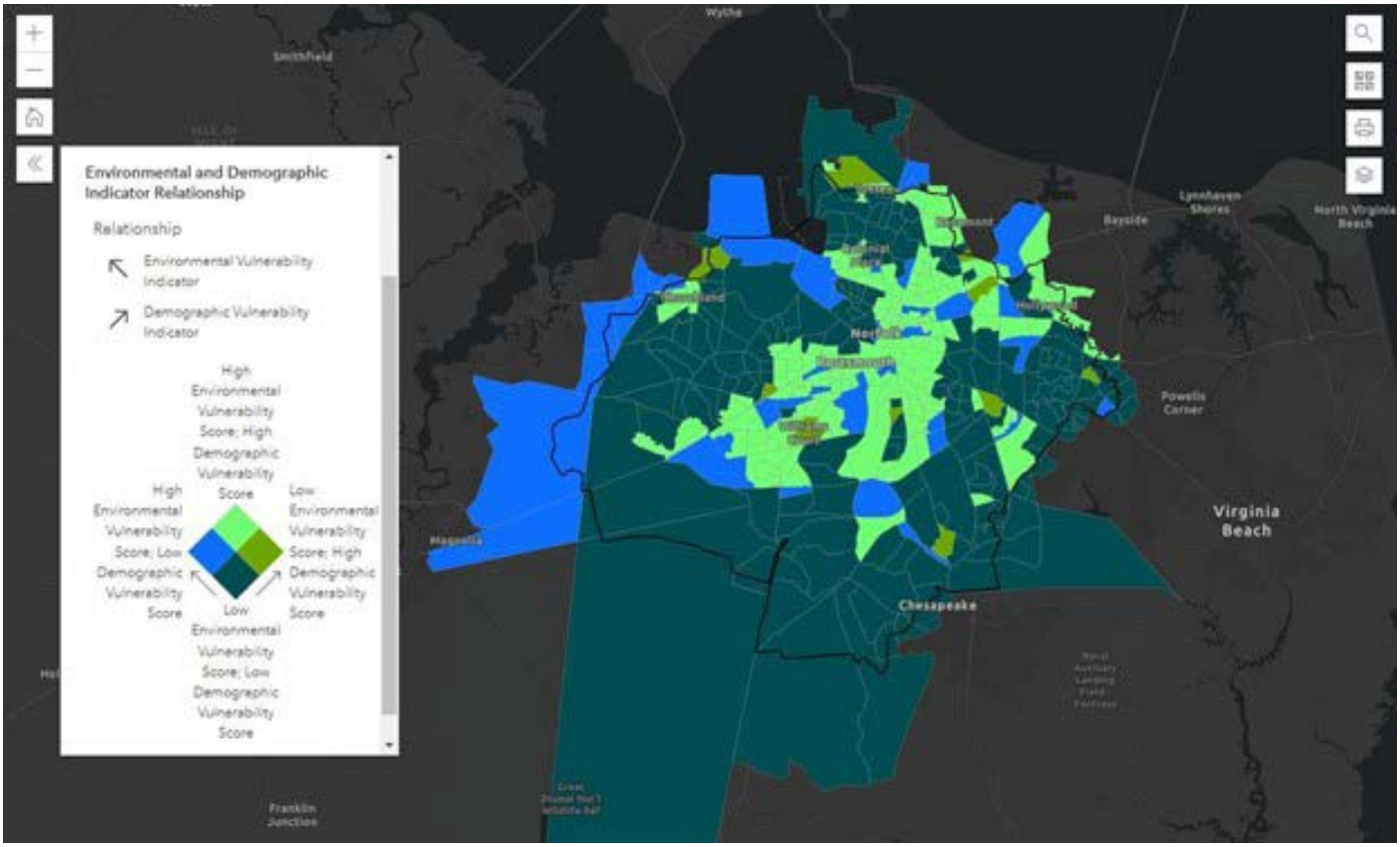
Equity actions are highlighted throughout this plan.
On-the-ground: From tree plantings to mitigate urban heat islands to abating water pollution from coastal flooding, our stakeholder team has elevated the urgency of working in the most demographically and environmentally vulnerable communities to face the challenges of today and the future.

"As someone who works in this space, I go to a lot of conferences where environmental justice and equity are talked about. It's great to be a part of an organization that is actually doing the work beyond the theoretical and 'what ifs.'"

- Esi Langston, Environmental Sustainability Manager, City of Norfolk; Environmental Justice and Equity Committee Chair for this plan

Education and outreach: The plan also recognizes the importance of more inclusive community engagement, proposed to include not only a far more comprehensive narrative of Elizabeth River history, but also more accessible environmental programming, from fishing to art to education of all ages, in demographically and environmentally vulnerable communities.

Elizabeth River Environmental Justice Map
Bright green = high demographic and high environmental vulnerability scores.



Elizabeth River Environmental Justice Mapping Tool
An on-line mapping tool, was prepared to support this plan and community-wide efforts by Virginia Institute of Marine Science and Elizabeth River Project. A variety of layers help planners target vulnerable locations and populations of the Elizabeth River watershed or drainage area.

ACTION 2

COLLABORATE REGIONALLY to become a model for resilience to rising seas and a changing climate. Support this with strong research, examples and policies.

Photo by Chesapeake Bay Program/Will Parson

Note: In addition to this section, sea level rise and a changing climate are addressed as key issues throughout the plan.

10-YEAR GOALS

Enlist all sectors to reduce carbon emissions across the four river cities (Chesapeake, Norfolk, Portsmouth, and Virginia Beach). Make the connection between sea level rise and the need to reduce climate change drivers, such as CO2. Support regional expansion of clean renewable energy and establish regional carbon reduction and energy efficiency goals, incorporating transportation and public transit.

Facilitate community resilience and adaptation to face rising sea levels and higher rates of flooding, especially for communities at risk. Hampton Roads Planning District Commission and the cities find equitable research and financing strategies to implement mitigation in communities facing sea level rise, especially those with a history of environmental injustice. Elizabeth River Project lead the way with its coming Resilience Lab. RISE, Old Dominion University's Institute for Coastal Adaptation and Resilience (ICAR), Wetlands Watch and local university architecture/ planning departments continue to research innovative coastal building and utility designs to withstand sea level rise.

5-YEAR GOALS

Area cities adopt a regional plan for adapting to rising sea levels. Partners foster a region-wide vision and strategy, potentially led by Hampton Roads Planning District Commission with VA Institute of Marine Science (VIMS) and the cities. Consider the migration needs of humans and wetlands as seas rise. Consider regional data-sharing.

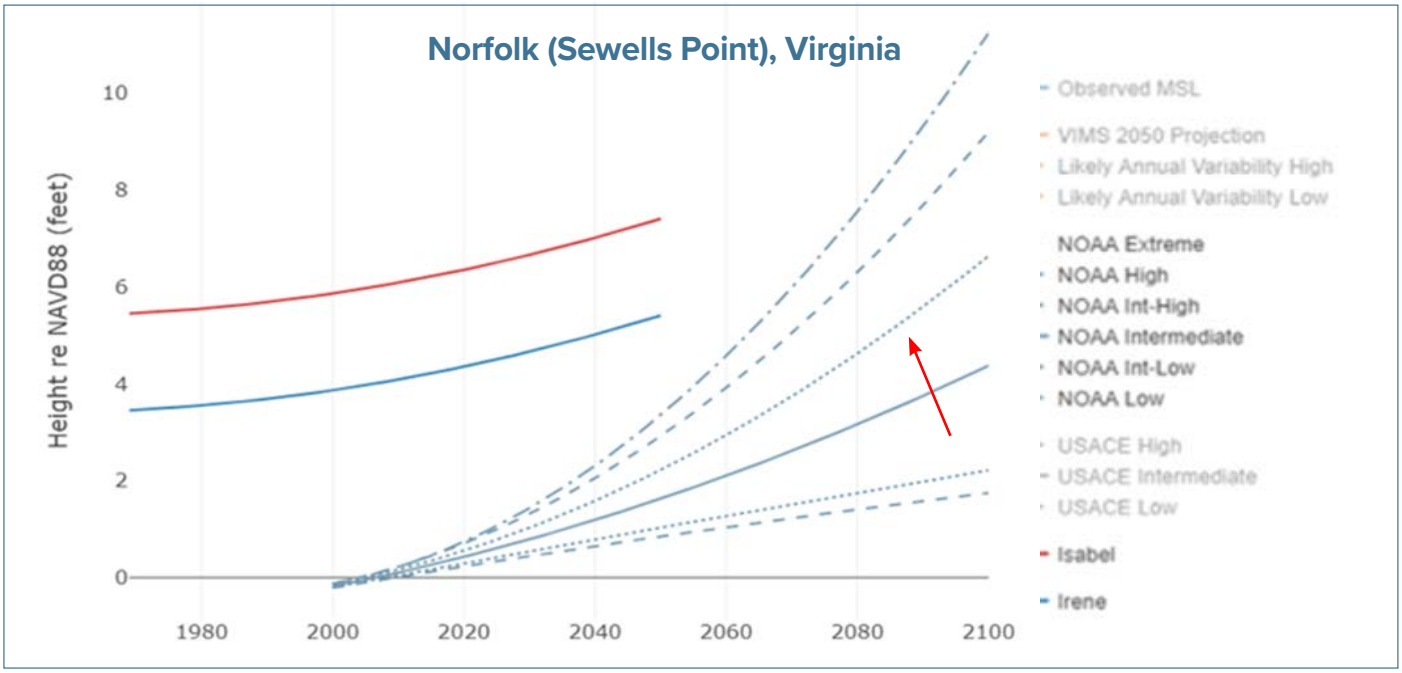
Elizabeth River Project through its coming Resilience Lab and other partners connect communities most at risk from sea level rise with resilience resources. Wetlands Watch, Elizabeth River Project, VIMS and cities encourage development of resilience hubs including the Resilience Lab across the region.

Wetlands Watch, William & Mary, and other partners spread awareness of the cost of doing nothing when it comes to sea level rise.

BACKGROUND - TOP NATIONAL ASSETS AT RISK

As one of the world's busiest ports, the Elizabeth River ranks 19th worldwide in value of assets at risk from tidal flooding by 2100 ($84.6 billion, current assets; $581.7 billion, future assets, Hampton Roads Planning District Commission). Sea level could rise as much at five feet here by 2100, predicts VIMS and the Center for Coastal Resource Management. Meanwhile, three factors limit coastal resiliency on the Elizabeth River:

1) Loss of 50% of tidal wetlands since 1945;
2) Intense urban development along a majority of shore, limiting the ability of marshes to migrate with sea level rise;
3) Lack of acceptance for natural approaches to shoreline development.



The region is using the NOAA Int-High curve to plan for sea level rise, predicting that by 2100, water levels will have risen as much as 5 feet compared to 2000. The numerous NOAA lines represent data using forecast models incorporating numerous variables that affect sea level rise. The NOAA trend lines show the variability of sea level rise within the region, with the NOAA Int-High curve being the most applicable to the Elizabeth River watershed.

While the last version of this action plan (2016) identified sea level rise and climate change as a priority, by 2021 these challenges had become among the most urgent for the future of the Elizabeth. The 2021 Elizabeth River Watershed Action Team recognizes that sea level rise will significantly impact under-resourced communities while also causing more toxics to enter the river through floodwaters. In addition, massive changes in the river habitat will occur over the next 100 years as wetlands either migrate up the shore or drown. A talented knowledge base of policy experts, elected officials and dedicated stakeholders served on the Sea Level Rise and Climate Change Resilience Subcommittee of the action team. The subcommittee recommended two prongs of approach: Helping reduce the root cause of sea level rise by reducing carbon emissions across the region (often discussed as "mitigation" of the problem); and facilitating better regional strategies to adapt to rising sea levels ("adaptation"). While ambitious for an area that struggles with regional cooperation, a regional plan spanning the four cities might help the most, the subcommittee said, to achieve more effective communication, share resources and together achieve a more resilient Hampton Roads.

"I was excited to see the inclusion of the concerns and the challenges faced by our most vulnerable communities throughout the entire plan. So few organizations try to do that in a holistic way, so kudos to you all."

Elizabeth Andrews, Director, William & Mary Law School's Virginia Coastal Policy Center; Sea Level Rise and Climate Change Resilience Committee Co-Chair for this plan

ADAPTING TO SEA LEVEL RISE ACTION STEPS

1. **Partners assist Hampton Roads Planning District Commission and localities to plan and implement a regional strategy for developing and redeveloping in ways that prepare for rising sea levels.** Coordinate across city lines, exploring funding options including the Virginia Community Preparedness Fund, National Fish and Wildlife Foundation Innovative Nutrient and Sediment Reduction grant or the creation of a Watershed Improvement District linked to Soil and Water Conservation Districts (see final chapter of this plan on potential financing options).

- A major component should be how to keep harmful substances out of the path of floodwaters (also see water quality).
- Coordinate public meetings to discuss viable adaptation strategies and the resources necessary to implement them.
- Encourage regional engagement and visioning for both communities that need to retreat from rising seas and those needing to receive the retreating communities.
- Consider buyouts that allow for life estates to enable current residents to live out their lives in a flooding area, or prepare to move as they can, but the residences will not be passed on to the next generation.
- Plan for safer housing and commercial buildings on higher elevation areas within the same locality.
- Explore the Virginia Community Flood Preparedness Fund to support localities to reduce the impacts of flooding.
- Consider a regional data sharing platform and regional programs to reduce sea level impacts, create community awareness and identify locations for Best Management Practices to improve water quality. Potential funding: National Fish and Wildlife Foundation Small Watershed grant or the Virginia Conservation Assistance program.
- Partners work with VIMS to identify priority areas and strategic pathways for wetland migration and provide localities with data so conservation efforts can focus in targeted areas. Potential funding, the National Fish and Wildlife Foundation Small Watershed grant, the Virginia Community Flood Preparedness Fund, or the National Coastal Zone Management program.
- Consider regional strategies for funding public resilience investments/projects at all scales as researched for this plan by the University of Maryland Environmental Finance Center.
- Old Dominion University's Virginia Modeling, Analysis, and Simulation Center, potential lead partner, calculate expected increases in losses (damages) due to rising sea levels at the local and regional level- can be done at regional or local level, acknowledging the difference between the cost of repeated short-term fixes and comprehensive cost of long-term solutions.

Elizabeth River Project's Pru and Louis Ryan Resilience Lab on North Colley will demonstrate practical measures to live and work in the urban floodplain. Rendering by Work Program Architects.

2. Elizabeth River Project complete the Pru and Louis Ryan Resilience Lab as a demonstration of how to adapt to rising seas in the urban floodplain. With a Learning Park open to the public, the three-story education center will be constructed on a busy commercial corridor along Knitting Mill Creek to showcase practical approaches for residents and businesses to continue to live and work despite rising seas. Changing science and art exhibits and workshops will focus on sea level resilience while the building itself demonstrates problems and solutions. The entry platform, along busy Colley Avenue, will be a floating dock to provide refuge in floods, painted with "warming stripes" that show Norfolk getting progressively warmer each year. A "living shoreline" and forested buffer of native plants will show natural approaches to adapting to rising seas while protecting the ecosystem. Solar power, electric vehicle charging and green walls will help reduce the carbon footprint. The building is planned to be obsolete in the next 50 years as waters rise.

3. To continue to advance adaptation technologies for the next generation of coastal buildings and water systems (drinking and waste water), Elizabeth River Project and partners should work with RISE and local university architectural and engineering departments to research next generation coastal buildings and water systems that can be deconstructed, as well as research energy efficiency practices in building designs.

4. Partners voice support for changing grant requirements to allow adaptations that are more affordable for under-resourced communities. Potential leads: Wetlands Watch, Environmental Defense Fund, and the Special Assistant to the Governor for Coastal Adaptation and Protection.

5. Mothers Out Front and St. Paul's Development Corporation are potential leaders in seeking to work with faith-based groups and other partners to bring resources to at risk communities to synergize resilience efforts. Partner with faith communities such as Virginia interfaith Power and Light. Partners explore potential funding from Hampton Roads Community Foundation.

6. Norfolk State University (NSU) and Elizabeth River Project carry out plans to develop a model of creative practices for engagement and empowerment of under resourced communities to address environmental challenges including from sea level rise and flooding. Grant application submitted to National Fish and Wildlife Foundation for the NSU Incubator for Environmental Justice ($1M). Also see community engagement section of this plan.

7. The watershed cities collaborate with VIMS to conduct a Social Vulnerability Analysis (determining where economically and environmentally vulnerable communities are located) and identify projects that could be good candidates for the Virginia Community Flood Preparedness Fund, which prioritizes low-income areas.

8. Promote job development in adaptation technologies, services, designs, and implementation, specifically for sea level rise through funding from GO Virginia workforce development grant.

Knitting Mill Creek, Norfolk, January 3, 2022, Photo by Chelsea Ellul

What you can do

AT HOME AND WORK

1. Compute your carbon footprint with one of these on-line calculators to identify areas for improvement:

- https://www3.epa.gov/carbon-footprint-calculator/
- https://www.nwf.org/Eco-Schools-USA/Pathways/Audit
- https://calc.zerofootprint.net/

2. Compost. According to a recent NPR article, composting is the single fastest and easiest thing every American can do to fight climate change. Organic waste that is sent to landfills releases methane, a potent greenhouse gas that contributes to climate change. Get started **HERE.**

3. Join a local solar co-op to reduce costs for adding solar panels to your house. Solar United Neighbors of Virginia can help you find a solar co-op near you - more info here. Joining does not commit you to going solar. The coops pool 30-100 homeowners together to attract competitive bids from installers.

4. Pedal to work and fun activities on bike paths such as the Elizabeth River Trail, Pedal to work and to fun outings. (bold blue). Cars and trucks account for nearly 20% of all emissions in the United States. Locally, consider biking the **Elizabeth River Trail** that currently extends from Norfolk State University to the Hermitage Museum & Gardens.

5. Visit the Elizabeth River Project's Ryan Resilience Lab, opening 2023, for practical approaches for living and working in the urban floodplain as sea levels rise - in ways that protect both you and the river.

6. Make a plan for reducing your company's carbon emissions, following the lead of River Star Businesses with ambitious net-zero carbon targets including Port of Virginia, CMA CGM and Cox Enterprises. Get started with ENERGY STAR's Building Upgrade Manual and Guidelines for Energy Management.

7. Businesses: Store all hazardous materials out of the way of extreme weather and rising seas. Make an emergency preparedness plan. Compile and share knowledge of where and how to shut off critical facility utilities, such as electric power, gas, water, hydraulics, compressed air and sewer systems. Visit **AdaptVA.com** for tools to assess risk, resources, case studies, forecasts and more.

REDUCE CARBON EMISSIONS ACTION STEPS

1. Chesapeake, Norfolk, Portsmouth, and Virginia Beach. with Hampton Roads Sanitation District, the Port of Virginia and the U.S. military conduct a regional inventory of emissions including transportation and energy. Set a regional goal for reduction of carbon emissions.

2. Encourage the development and adoption of municipal/regional state climate plans that include items such as charging stations and renewable energy sources through partnerships with the cities, Hampton Roads Planning District Commission and Old Dominion University's ICAR.

3. Wetlands Watch, ICAR, Environmental Defense Fund, Elizabeth River Project, Chesapeake Bay Foundation and other partners **teach the connection between Sea Level Rise and the need to reduce climate change drivers.** Potential funding: Federal grants such as National Fish and Wildlife Foundation and National Oceanic Atmospheric Administration education grants.

EV stations like this one will be part of the Elizabeth River Project's Resilience Lab. Region-wide, more needed.

What you can do

AT SCHOOL

1. Schedule a field trip to the Elizabeth River Project's award-winning Dominion Energy LEARNING BARGE. Take part in hands-on experiments at six learning stations as you explore the barge's sun and wind power and live wetland.

2. Conduct a Youth Resilience Project with the Youth Resilience Expo. Past projects have included capturing rain water in rain barrels, conservation landscaping with native plants, and river cleanups. High school students at The Hague School in Norfolk worked for 3 years with Elizabeth River Project, City of Norfolk and Master Gardeners to conduct litter clean ups and add rain cisterns and water tolerant grasses around their schoolyard, helping reduce flooding and pollution in the Hague. Find out more, email Sarah McBride, smcbride@elizabethriver.org.

"By fixing this relatively small body of water, we as a school, community and city can push for a better environment, not only for this area, but for the world as a whole!"

- Brody, 10th grade, The Hague School, regarding a Youth Resilience Project along the Hague with Elizabeth River Project and partners.

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3. Organize Walk or Bike to School Days - Get started with these great ideas form VIRGINIA DEPARTMENT OF TRANSPORTATION

4. Help your school implement "no-idle" zones for school buses and carpool lines, In Virginia, tailpipe pollution accounts for 48% of all greenhouse emissions! Support the switch to electric buses - follow the lead of Chesapeake Public Schools that added electric buses to its fleet through a program with Dominion Energy MORE HERE.

4. Incentivize alternative transportation and mass transit to reduce nitrogen and carbon emissions, as well as reduce other greenhouse gases. Continue expansion of bikeable walkable cities and electric transit (from water quality subcommittee). Advocate for the expansion of public transit, with a particular emphasis on EV buses. Potential lead partners: Mothers Out Front, Hampton Roads Transit (HRT) and area cities.

HRT is helping clear the air with zero-emission electric buses | Photo by Hampton Roads Transit

5. Expand clean renewable energy (e.g., solar, wind) in under-resourced communities by exploring Virginia Commercial Property Assessed Clean Energy Authority (C-PACE) funding. Support climate mitigation measures including other energy efficiency goals with a focus on supporting underserved communities and reducing inequitable energy burdens and emissions. Potential lead partners: Dominion Virginia Power, Convert Solar, Solar United Neighbors and Elizabeth River Project through River Star Homes.

Unity Renaissance, a River Star Business with Elizabeth River Project, is now powered by the sun.

ACTION 3

RESTORE CLEAN WATER. Reduce nutrients, chemicals and harmful bacteria and improve water clarity in the river, with a focus on reducing pollution in under-served communities and those vulnerable to rising seas.

Intern To'niah Harrison explores river health with Joe Rieger, Elizabeth River Project. Photo by Casey Shaw

BACKGROUND - PAST PLANS = BIG PROGRESS

Once presumed dead after four centuries of abuse and neglect, the Elizabeth River scored an overall grade of a "C" in the 2020 State of the Elizabeth River Scorecard by Elizabeth River Project, VIMS and more than a dozen area scientists. Improvement has come about through the collaboration of many public and private partners, guided in part by earlier versions of this plan.

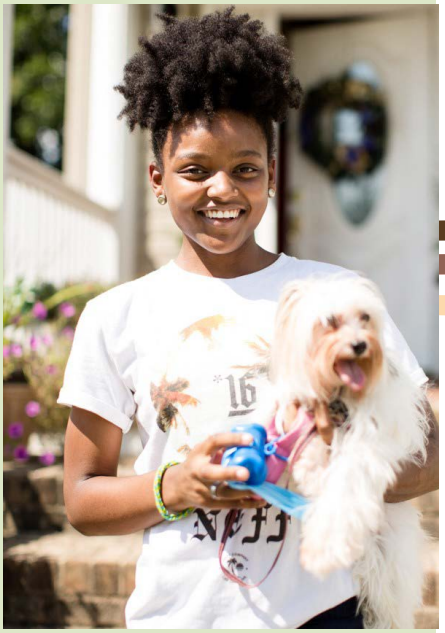
Water quality in the river, though, still suffers from an array of problems. The Water Quality Subcommittee of Watershed Action Team 2021 assessed the greatest current threats to water quality. Some of them are relatively new, including plastic pollution and "contaminants of emerging concern" (chemicals whose impacts on human health and the environment are not yet fully understood but that are suspected to be harmful). Others remain chronic, such as excess nutrients, microbial and fecal pathogens, and suspended solids. Accelerating these risks are sea level rise and climate change, including increased intensity and frequency of rain, and urbanization as more and more of the Elizabeth River watershed becomes densely developed.

The good news: More than 140 organizations stand at the ready to continue to reduce pollution voluntarily as Elizabeth River Project's River Star Businesses, while more than 6,100 residents have pledged to do their part as River Star Homes with Elizabeth River Project. As of 2022, the businesses have documented numerous voluntary efforts to reduce their pollution and restore vital river habitat, while the residents have carried out more than 1,200 on-the-ground projects with documented nitrogen, phosphorus, and sediment pollution reductions.

Meanwhile, among additional partners, VIMS now receives a significant state allocation each year to conduct robust monitoring of water quality in the

What you can do

1. Scoop the poop. The average dog creates 274 lbs of poop per year that can contribute harmful bacteria into the river if left unscooped. Clean up after your pet and help keep the river healthy for humans, fish, and wildlife. Earn your free River Star Home garden flag when you commit to this and other river-friendly practices **HERE.**



2. Reduce lawn fertilizers. Another step of being a River Star Home - Always do an at-home soil test from your local master gardeners or **WaypointAnalytical** to learn exactly how much fertilizer to apply to save you money and protect the river.

3. No grease down the sink. River Star Homes also know that grease can clog sewer pipes, causing sewer overflows. When that happens, the sewage too often washes down storm drains to the river. Instead - let the grease cool, put in a closed container and in the trash.

Elizabeth. The four watershed cities are engaged in continuous implementation of projects to reduce pollution from stormwater and educate the public in cooperation with the Hampton Roads Planning District Commission (HRPDC) through **askHRgreen.org.** Meanwhile HRSD, the regional wastewater authority and the river's largest discharge facility, has launched a massive and innovative project, Sustainable Water Infrastructure for Tomorrow (SWIFT), expected to dramatically reduce nutrients in the Elizabeth.

"I'm so excited that nutrient and contamination inputs and impacts from tidal flooding are being taken into account!"

Margaret Mulholland, Professor of Ocean and Earth Sciences, Old Dominion University; chair, Water Quality Chair for this plan

10-YEAR GOALS

Expand water quality projects in vulnerable communities, identifying them through the Elizabeth River Environmental Justice mapping tool and other locally relevant data and prioritizing them in ranking criteria when partners pick and fund projects.

Reduce nutrients and sediments so that all river sections earn "C" or better for nitrogen, phosphorus, and/or clarity by the 2030 State of the Elizabeth River Scorecard.

Reduce bacteria so that all sections of the river earn a "C" or better for Enterococci bacteria by the 2030 State of the Elizabeth River.

Dolphins are now frequently spotted on the river.

5-YEAR GOALS

Reduce excess nutrients and sediments to reduce algae blooms and improve water clarity by improving State of the River Scores as compared to SOR 2020 scores by one letter grade for nitrogen, phosphorus, and/or clarity in each branch or tributary of the river. Excess nutrients and sediment affect the health of all branches of the Elizabeth River and will be assessed in the next scorecard for the river.

Achieve reductions in fecal indicator bacteria by focusing on branches and tributaries receiving below a "C" for Enterococci bacteria and failing to meet recreational health standards in the 2020 scorecard.

Mitigate water pollution from coastal flooding by implementing a variety of **Best Management Practices (BMPs)** ranging from green infrastructure to human behavior change.

Develop a better understanding of emerging contaminants in the watershed and assess how to mitigate them from entering the river. Seek funding mechanisms and partners to compile contaminant data/information and identify data gaps.

4. Don't flush medicines.
Find a take-back program near you **HERE** or contact your local law enforcement agency.

5. Pump out your boat.
HRSD offers a free boater pump out program. Call 757-460-4253 or submit an online request **HERE.**

6. Kids and schools - conduct a hands-on project to reduce pollution in runoff with **Elizabeth River Project's Youth Resilience program,** Free water monitoring kits are often available for students committing to help with water quality testing around the river.

7. Participate in volunteer science initiatives such as Catch the King tide and "Measure the Muck." Each of these offer excellent ways to learn more about our impact on the river while contributing to ongoing research.

REDUCE EXCESS NUTRIENTS AND SEDIMENTS ACTION STEPS

1. Partners should help localities meet or exceed their Chesapeake Bay "Total Maximum Daily Loads" or goals for limiting pollution, by promoting, incentivizing, and finding funds for best management practices on public and private land. These practices will help reduce the amount of nitrogen, phosphorus, and sediment reaching the river from stormwater run-off and flooding.

- Create at least 750 linear feet of "living shorelines," or shorelines constructed to mimic natural systems for controlling erosion, on residential properties per year in (as part of habitat goals in this plan).
- Convert on average 0.5 acres of "impervious surface" (hard surfaces such as pavement and roofs; rain runs off and can become stormwater pollution) or turf grass to conservation landscaping or buffer filter strips per year in support of this plan's habitat action goal of 15 acres of "riparian buffer," or shoreline plantings to filter pollution, restore habitat and halt erosion, over 10 years.
- Support habitat goals of this plan as well by planting 500 native trees per year through community supported tree adoption events.

2. Elizabeth River Project and askHRgreen.org should increase relationships in under-represented communities as indicated by the Elizabeth River Environmental Justice Mapping Tool. Provide these residents with access to the benefits included in the River Star Homes and Bay Star programs to create resilient homes as well as a resilient rivers.

3. Encourage the cities of Portsmouth and Chesapeake to develop green infrastructure plans and invest in tree coverage to help them access additional funding opportunities.

4. Increase awareness in at least two tributaries to reduce boat speeds in shallow waters. Fewer boat wakes will reduce reintroduction of suspended sediments, nutrients, and contaminants to river waters.

5. Support funding for VIMS, ODU, United States Geological Survey (USGS), and local partners to add three water quality monitoring stations, so that there is one in each branch, to improve understanding of hydrographic conditions and water quality (including tidal flooding, freshwater inputs, water clarity, excess algal biomass, dissolved oxygen) to inform models and strengthen policy to reduce those loads to the Elizabeth River.

REDUCE BACTERIA ACTION STEPS

1. **Area localities should continue to work with HRSD,** Elizabeth River Project and other partners to reduce sanitary sewer overflows through increased surveillance, prioritized upgrades and maintenance, and residential participation in education programs.

2. **HRSD and cities use HRSD's novel and sensitive** "Collection System Investigation Microbial Source Tracking" program to help find and fix leaks in sewage pipes.

3. **Promote participation in HRSD's boater pump-out program** and education efforts about the harms of untreated discharge from boats to promote behavior change. Support enforcement of current discharge regulations of untreated sewage. Support EPA ruling to achieve a statewide no discharge zone Bay-wide.

4. **Establish a network of organizations such as AskHRgreen, WHRO, River Star Homes, Bay Star Homes,** and animal welfare groups to coordinate and increase "Scoop the Poop" campaigns and social media posts prior to large storm and tidal flooding events to help increase awareness about the bacteria in pet waste and influence behavior change.

5. **Expand ongoing research and monitoring for pathogen contamination, viruses, and non-algal microorganisms throughout the watershed.** A partnership of HRSD, VDH, and public health entities, VIMS, Old Dominion University and Elizabeth River Project identify major water-related pathogens of concern in Hampton Roads.

Photo by Elizabeth River Project/ Mary Bennett

REDUCE POLLUTION FROM COASTAL FLOODING ACTION STEPS

1. **Keep substances harmful to humans and the ecosystem out of the path of floodwaters by implementing strategies such as trash collections, storm drain cleanouts** and public awareness campaigns prior to storms or flooding.

2. **Develop a regional taskforce to improve the understanding of areas vulnerable to toxic chemical releases as a result of flooding or storm-induced impacts and disseminate findings for policy reform.**

Items to evaluate include:

- Using VA DEQ's Environmental Data hub, identify upland sites with legacy contamination
- Unidentified, abandoned, and unaddressed sites with potential contamination,
- Abandoned underground storage tanks and aboveground storage tanks vulnerable to flooding or impacts from hazardous weather conditions.
- Low income, vulnerable communities identified using Elizabeth River Environmental Justice Tool, and areas predicted for future flooding and submersion from sea level rise.

3. **Propose at least two projects using earmarked state and federal funding for low-income communities to improve stormwater management and reduce flooding impacts in under-resourced communities.**

4. **Wetlands Watch and university students will continue collaborative planning with sub-watersheds at risk to combat the challenges of flooding and water pollution.**

ASSESS EMERGING CONTAMINANTS ACTION STEPS

1. **Academic partners compile and catalog existing information into a curated database to identify sampling and screening needs for at least one tributary, within the next five years,** for a comprehensive range of contaminants to address knowledge gaps associated with existing or emerging contaminants.
   - Address items including but not limited to "PFAS," a family of chemicals used for water repellant properties; pharmaceuticals, herbicides/pesticides (including fluorinated pesticides, neonicotinoid, and pyrethroid insecticides), heavy metals, mercury and 6PPD-quinone (commonly used in car tires), in the Elizabeth River which may impact human and marine life in ways that remain to be determined.This database will serve as a model for creating a database for all five main branches of the Elizabeth River to be established within the next 10 years.

2. **Propose a monitoring study** with academic partners to examine bioaccumulation of toxins in organisms and identify where this is impacting humans through subsistence fisheries.

3. **Assist VA Department of Environmental Quality** in developing the Total Maximum Daily Load for PCB contamination (this highly toxic product was once used in electrical apparatus and has been banned since 1978) for the James /Elizabeth River system and identify sources and appropriate monitoring strategies.

4. **Elizabeth River Project host at least one business or residential workshop** per year to promote safer alternatives for herbicides/pesticides and increase collection and disposal events at Elizabeth River Project's Ryan Resilience Lab in Norfolk and Fred W. BeasleyRiver Academy at Paradise Creek Nature Park in Portsmouth.

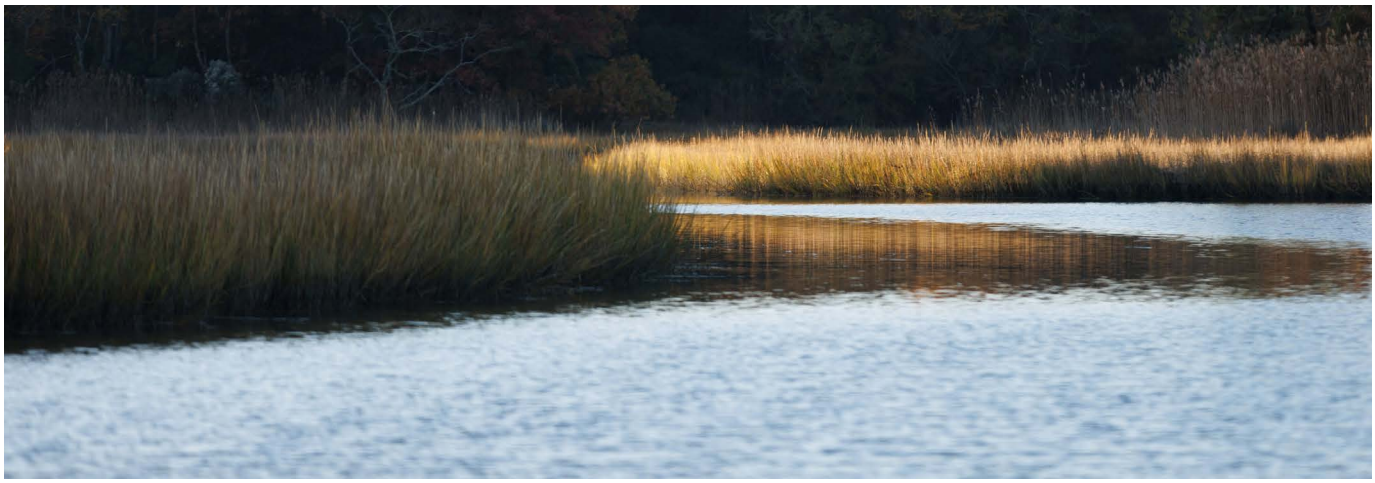
5. **Reduce the risk of pharmaceuticals entering the river** by promoting collaborations with pharmacies that participate as medication disposal sites.

EXPAND WATER QUALITY IMPROVEMENT PROJECTS IN VULNERABLE COMMUNITIES ACTION STEPS

1. **Localities should add the Elizabeth River Environmental Justice Mapping Tool** and local data into their ranking criteria when scoring and developing plans for capital improvement projects for stormwater and flooding improvements.

2. **Partners should develop a funding matrix** to include all available sources of funding for implementation projects in vulnerable communities.

3. **All partners should make every effort** to incorporate community involvement and education during conceptual, development, and implementation phases for all stormwater and flooding improvement projects.



ACTION 4

CREATE AN INCLUSIVE RIVER revolution led by people of all ages and walks of life who understand, embrace and promote the restoration of the Elizabeth.

Watermen show their catch to students visiting the Elizabeth River Project's Dominion Energy Learning Barge. Photo by Larry l'Anson

BACKGROUND - THE RIVER ONCE WRITTEN OFF

There was a time not so long ago when few residents knew even so much as the name of the Elizabeth River. Urban legend had it, you would need six shots if you fell into the waterway, too often viewed as an industrial sewer beyond hope of reclamation.

Today there is a groundswell of support for the restoration of the Elizabeth River as residents hail the return of dolphins, river otters, eagles and seahorses. As many as 20,000 children each year take part in hands-on experiences to get to know "Liz" as their home river. Teachers and school systems partnered together for the river. They may board the Elizabeth River Project's Dominion Energy Learning Barge to explore her live wetlands, measure river water for bacteria and meet watermen pulling up alongside with the day's catch of crabs. They may conduct year-long service projects to reduce toxic flooding at their schools or teach others to become river stewards as Elizabeth River Project Resilient River Star Schools. Still more children visit 40 acres of restored wetlands and forest at Elizabeth River Project's Paradise Creek Nature Park for Forest School and Youth Conservation Internships. Meanwhile, adults fly yard flags as River Star Homes and Bay Star Homes, committed to do their part alongside River Star Businesses. The businesses conduct a friendly competition for the most progress reducing pollution voluntarily; recognized annually in a packed ballroom. Elizabeth River Project holds RIVERFest for 1,500 to 3,000 attendees each year in non-COVID times.

From the Virginia Zoo to Norfolk Botanical Gardens, Nauticus, area cities and the Hampton Roads Planning District, multiple organizations join Elizabeth River Project in presenting workshops and programs relating to river ecology and community stewardship. COVID-19, in fact, has brought residents to outdoor spaces along the Elizabeth in record numbers.

Yet large swaths of apathy remain. Of greatest concern to Watershed Action Team 2021 are under-resourced communities with little access and few recreation opportunities to enjoy the Elizabeth River. As well, the team expressed an urgency to tell a more inclusive history of the Elizabeth. Slavery first arrived in America near the mouth of the Elizabeth. The port river was central to slave trade and to the escape of slaves along the Underground Railroad.

"I'm excited about enhancing recreation and opportunities in underserved areas"

Dr. Theresa Whibley, former Norfolk City Council; co-chair, Education and Community Engagement Committee Co-Chair for this plan

10-YEAR GOALS

Establish regional centers in each of the four river cities focusing on education and empowerment relating to environmental justice and equity. The centers should highlight local environmental history, current environmental challenges and solutions and empower community-based solutions in collaboration with universities and colleges.

5-YEAR GOALS

Elizabeth River Project and area schools and partners connect 25,000 children Pre-K-12th grade to their river each year with inclusive river education. Provide children with inspiring, hands-on roles as Resilient River Star Youth, transforming them into lifelong stewards.

Encourage community leaders, localities and educators to prioritize need in selecting where environmental education efforts take place, considering areas with the worst ecosystem scores **(State of the Elizabeth River Scorecard)** and those identified as the most vulnerable in the Elizabeth River Environmental Justice Mapping Tool.

Listen to and empower the most under-resourced communities in all four cities to become fully engaged in river restoration and education as well as fully informed of flooding and other environmental risks. Elizabeth River Project and Norfolk State, with VIMS, develop criteria and identify communities to begin the effort ($1M grant application pending, National Fish & Wildlife Foundation, for an Incubator for these partners to develop creative best practices for engaging under-resourced communities).

Share the river's beauty & bounty, achieving more equitable opportunities for experiencing the river's benefits. Elizabeth River Project and partners create public programming targeted to reach under-resourced communities. Hold at least two fishing, kayaking or art events for these communities annually, attended by at least 500 people annually. Provide accessibility to the handicapped.

Inform a new, inclusive historical narrative about the Elizabeth River, led by Norfolk State University with participation and buy-in of the maritime and environmental communities and all relevant area keepers of history. Disseminate by website, performed and written word and visual arts, engaging all major sectors and reaching an audience of 25,000.

Norfolk State University students and community volunteers help construct an oyster reef using new innovative materials on the Eastern Branch. Photo by Elizabeth River Project/Joe Rieger

YOUTH EDUCATION ACTION STEPS

1. UNDERWAY - Elizabeth River Project with multiple regional partners seek federal grant funding for a year-long program of multi-disciplinary river education collectively reaching many more children with meaningful river experiences than could any one partner. A collaboration is being pursued to achieve multi-partner, multi-site, multi-disciplinary Elizabeth River Project, the four school Districts (Norfolk, Portsmouth, Chesapeake and Virginia Beach), Norfolk Botanical Garden (not plural), Virginia Zoo of Norfolk, Boys and Girls Clubs of Southeast Virginia, Girl Scouts of Colonial Coasts, WHRO, Norfolk Arts, Chesapeake Bay Foundation and Nauticus. Elements being explored include:

- Develop the next generation of environmental leaders by establishing a regional youth advisory council, building on successes of the Virginia Zoo, Nauticus and the Slover Library's youth advisory board. Consider the model of the **Seattle Youth Climate Council.**
- Provide diverse opportunities that help high schoolers complete the Virginia Dept. of Education's Seal for Excellence in Science and the Environment annually.
- Build new partnerships to address underserved teens with Teens with a Purpose, Elizabeth River Project's Youth Conservation Internships, local universities, Chesapeake Bay Foundation, and Hampton Roads Workforce.
- Engage diverse partners such as Parent Teacher Associations, For Kids, community centers, YMCAs and faith based groups to create after school programming that provides children with hands-on activities about the river.
- Expand the Elizabeth River Project's Youth Resilience Expo, assisting 1,000 to 3,000 students a year in hands-on projects with measurable results.
- Consider national programs such as GLOBE, American Conservation Experience, Roots to Shoots and NEEF to provide collaboration opportunities with local universities and K-12th grade educators and students.

2. Partners work together to seek to enlist the Virginia Department of Education, local teachers, superintendents, and administrations, and corporate sponsors to incorporate diverse river history into Virginia Standards of Learning.

3. Take advantage of the 2022 expansion of the Fred W. Beazley River Academy at Paradise Creek Nature Park to grow the Elizabeth River Project's Youth Conservation Intern program for teenagers with barriers for success. The intern program is a partnership with Hampton Roads Workforce Council to engage at-risk youth in paid internships to learn conservation horticulture skills. Partner with Teens with a

4. Continue the Elizabeth River Project's Learning Barge and Learning Barge on Wheels programs, with priority recruiting in disadvantaged communities and an emphasis on priority ecosystem needs.

Students mimic osprey nest building aboard the Learning Barge.
Photo by Chesapeake Bay Program/Will Parson

ENGAGE THE DIVERSE COMMUNITY ACTION STEPS

1. **UNDERWAY -** Norfolk State University and Elizabeth River Project, responding to early discussions of this plan, have agreed to form a new NSU-ERP Incubator for Environmental Justice to develop a model on the Elizabeth River, replicable bay-wide, for engaging and empowering under resourced neighborhoods to take part in environmental restoration ($1 M grant proposal submitted, National Fish and Wildlife Foundation, Innovative Nutrient and Sediment Reduction Grant Program).
    - As well as carrying out on-the-ground projects in under-resourced communities, the partners will explore creative approaches ranging from art to story-telling as well as community science monitoring, water safety and fishing to engage two priority under-resourced communities, selected with VIMS and its mapping tool for environmental justice. At the close of the three-year grant, the partners will develop a guidebook to best practices for engagement of under-resourced communities in environmental restoration.

2. **Participating partners prioritize communities to receive education services** based on highest need identified in the State of the Elizabeth River Scorecard and the VIMS Elizabeth River Environmental Justice mapping tool. Consider locating Elizabeth River Project's RIVERFest and other river education events with community partners to provide communication in neighborhoods where gaps are identified.

3. **Encourage partners to develop Resilience Hubs** at the Elizabeth River Project's Ryan Resilience Lab and Norfolk's Broad Creek Library as part of larger Ecodistrict development. In Portsmouth, develop the River Academy at Paradise Creek Nature Park as a resilience hub and identify other locations in Chesapeake and Virginia Beach.

4. **Partners consider Survey123** to create and share surveys with a geo-reference to find pollution hotspots.

5. **Consider a leadership program targeting underserved communities** that is focused around elevating their own voices on EJ issues and encouraging more environmental activists within those communities

6. Elizabeth River Project, VIMS and other partners, host webinars and presentations to **disseminate the Elizabeth River Environmental Justice Mapping Tool** to regulators, city councils, academia to address flooding in underserved communities.

7. **Elizabeth River Project grow the footprint of** River Star Homes and River Star Businesses and schools in demographically and environmentally vulnerable neighborhoods using the mapping tool. Address economic barriers for these communities by exploring a "pay what you can, no questions asked" model for programs and a renter's division for River Star Homes.
    - Grow the River Star Homes program to 10,000 residents throughout the watershed.

SHARE THE BEAUTY AND BOUNTY ACTION STEPS

1. Elizabeth River Project and partners increase fishing and kayaking opportunities in environmentally and demographically vulnerable areas along the Elizabeth, taking advantage of feedback from the listening sessions and Environmental Justice mapping project. Explore the Anacostia education model for fishing & kayaking for inner-city audiences.

- Include education on fish consumption advisories and responsible fishing
- Partner with local fishing clubs and other potential partners such as Chesapeake Parks & Rec (Elizabeth River Park fishing pier), Boat U.S., Bass Pro, VA Health Dept, local health departments, VMRC, Healthy Chesapeake/ South Norfolk food "farmacy" food bank
- Engage a local chef and the Hampton Roads Show to teach how to filet/cook fish to reduce PCBs. Work with local seafood industry representatives, seafood restaurants such as Wickers Crab Pot, local watermen, bait shops such as Culpepper Fishing; Freedom Boat Club boat rentals; Nauticus; ODU Outdoor Adventure Program; Tidewater Wooden Boat and Sail Nauticus; VA Aquarium sustainable fishing program; Greek Organizations at local universities.
- Host "Friday Fishing Nights" or similar programs, considering a free loaner fishing kit for kids. Possible location where kids and guardians can learn to fish could be the Ryan Resilience Lab, Paradise Creek Nature Park, and the Learning Barge.
- Establish an empowerment fishing program with Wesley Community Center in Portsmouth on Elm Avenue.
- Resources: VA tourism association grant to partner on materials, other ideas Jordan Brown (Urban Renewal Center), Mike Farris (with Urban Discovery Ministries), Antipas Harris

2. Elizabeth River Project-NSU Incubator with the Living River Trust: Identify the most disadvantaged communities with no green spaces on the river and pursue as priority sites for new parks, art, canoe launches and other opportunities for enjoyment. Promote other recreation opportunities as well.

- Friends of Indian River, Elizabeth River Trail Foundation, Elizabeth River Project and other partners collaborate to increase bike trails including a possible continuation of the Elizabeth River Trail into Chesapeake and a "Creek to Sky" Trail from Paradise Creek Nature Park to the top of the Jordan Bridge.
- Encourage businesses being able to launch boating at city sites such as Veterans Launch on Knitting Mill Creek.
- Promote maps of public access.
- Consider GPS based app with QR code on signage at docks and boat launches that show the map of the watershed, give information on fish consumption advisories.

Photo by Elizabeth River Project

GIVE FLOODING ALERTS ACTION STEPS

1. To address flooding and environmentally relevant information, all the Elizabeth River cities develop comprehensive, multi-media communication plans for and with environmentally and demographically vulnerable communities for flooding alerts, evacuation routes, community planning meetings, and environmental education opportunities.

- Target communities defined by the new mapping tool as the most vulnerable.
- Install real-time water level monitoring and flooding alert systems to inform the passability of streets in partnership with WAZE, RISE Resilience challenge, and Norfolk Resilience office. Consider PSAs and diverse media sources such as Black Information Network radio station, Norfolk State radio station, churches, civic leagues.
- Use community-based grants to examine existing regional flood evacuation information. Triangulate communications to reach different age groups.
- Expand community science monitoring programs like ODU's Measure the Muck, Catch the King and Elizabeth River Project's community science monitoring for students to educate residents regarding the hazards of contact with flood and stormwater.

"Measure the Muck" community science, Photo by Wetlands Watch

INSPIRE ACTION, CLIMATE CHANGE/SEA LEVEL RISE ACTION STEPS

1. Inspire everyone in the Elizabeth River area to do something about climate change and sea level rise (also see sea level rise area of the plan). Target communities defined by the new mapping tool as the most vulnerable.

- ODU ICAR and Elizabeth River Project's Ryan Resilience Lab coordinate education programming on resilience with additional partners.
- Expand opportunities and education regarding the climate benefits of composting.
- Increase education on proper household hazardous waste disposal, organic lawn care practices, alternative transportation, reducing carbon footprint and encouraging Best Management Practices for managing pollution for River Star Homes and Bay Star Homes.

MAKE LITTER UNCOOL ACTION STEPS

1. Create a culture that avoids single-use plastics as the most common source of litter and address littering behaviors that have the most impact on the ecosystem.

- For behavior change among our average community members, target plastics and land-based behavior (an estimated 80 percent of what ends up in the river started on the land). Enlist all ages – include in K-12 programs, university outreach, public programs, and volunteer events. Make littering un-cool.
- Abandoned fishing nets, crab pots and other fishing gear currently are identified as the #1 damaging litter to the ecosystem. The issue needs further research by VIMS, NOAA, and other partners. Elizabeth River Project engage relevant fishing agencies and groups to plan and carry out behavior change outreach to reduce abandoned fishing lines.

What you can do.

1. Avoid single-use plastics. The Ocean Conservancy estimates that 84% of all items collected during the International Coastal Cleanup are made of plastic (Mallos, 2016).

2. Volunteer with a litter clean up effort, such as Norfolk's Green Bucket Brigade, Keep Portsmouth Beautiful or Elizabeth River Project's cleanup events on the first Saturday of each month: **elizabethriver.org.**

3. Fish responsibly - your "ghost gear" can be the deadliest kind of litter. Derelict fishing gear or ghost gear is any discarded, lost, or abandoned, fishing gear in the environment such as crab pots, fishing line, hooks and weights. These can trap, entangle and potentially kill marine life. Learn more: Global Ghost Gear Initiative and this report from **Ocean Conservancy**. Reduce diamondback terrapin mortality in recreational crab pots **MORE**

4. Tell the full story of the Elizabeth River. Bring your organization into the fold to complete and share a new, diverse river history to diverse audiences, with many partners and through many mediums, from art to walking tours to websites and publications.

5. Sponsor, host, or help teach nature experiences like kayaking, guided walks, or fishing in vulnerable communities Contact Elizabeth River Project, 757-399-7487.

- Participating partners implement the 2021-2025 VA Marine Debris Reduction Plan, bringing together partners to address these and other needs.
- Elizabeth River Project, HRPDC, Keep VA Beautiful, and area universities create social marketing campaigns to make it cool and easy to re-use bags and bottles, from school age to adult. Include NSU Graphic Design program to create educational and engaging art installations to get people thinking about litter.
- Partners support policies that reduce or eliminate plastic bags and bottles.
- Enlist VIMS and other partners to gather data that can lead to meaningful policies to reduce litter, such as the impact of microplastics and other litter in the Elizabeth River, specifically.
- Local partners take advantage of regional and national resources such as Surf Rider Foundation, Ocean Conservancy, Longwood University, NOAA, VIMS, Division of Coastal Resources Management to educate the public on how microplastics impact the river (from water quality).

TELL THE FULL STORY ACTION STEPS

1. Norfolk State University, Elizabeth River Project and other partners collaborate on completing and disseminating a new, diverse river history to diverse audiences, from school children to the public. Partners should also include the Great Dismal Swamp Wildlife Refuge, Virginia Maritime Association, Great Bridge Battlefield Waterways History Foundation & Museum, Old Dominion University Filipino Cultural Center, area libraries and Portsmouth Naval Museum.

- Expand the persona of the river beyond the Elizabeth River Project's re-enactment character, Princess Elizabeth (British royalty for whom the river was re-named from the Chesapeake in the early 1600s), to identify and consider giving voice to other players in the river's powerful role in history. Consider creatures as the mascots, engaging students in picking and depicting them.
- Engage local artists, universities in telling the river's story through changing art installations at Elizabeth River Project's Ryan Resilience Lab.

SUPPORT OTHER AREAS OF THE PLAN ACTION STEPS

1. Continue the "goo must go" education campaign to address sediment contamination in the river bottom. Work with local leaders, the public and schools to educate everyone on the importance of the bottom of the river as the foundation of the food chain and the urgency needed to address contamination that can render the bottom of the river void of life and cause cancer in bottom-dwelling fish.

2. Document annual bird & wildlife impacts to raise awareness and concern with partners including wildlife rehabilitators, photojournalists, the Center for Conservation Biology, Virginia Master Naturalists, and Cape Henry Audubon. Develop social marketing messages highlighting stories from wildlife rehabilitators and bird toxicology studies.

Photo by Denise Maples

ACTION 5

ACTION 5: THE GOO MUST GO! Clean up contamination in the river bottom while also reducing PCBs in fish.

Elizabeth River Project/Casey Shaw

BACKGROUND - HALFWAY THERE!

"The goo must go!" has been the top focus of prior Watershed Action Plans for the Elizabeth - but drops down in priority this time because of so much progress made. The bottom of rivers forms the foundation of the food chain. Many contaminants will accumulate in the sediment where these pollutants can later become a source to the water column and expose the river's organisms. For these reasons, cleaning up the legacy contamination sites is still very important. While Elizabeth's bottom still harbors hotspots with some of the highest levels of sediment contamination in the Chesapeake Bay, scientists estimate as many as half of the river's hotspots have now been addressed.

The US Environmental Protection Agency in 2020-21 completed the largest cleanup, a project costing more than $100 million to address contamination at Atlantic Wood in Portsmouth, one of a half-dozen wood treatment facilities that one operated on the Southern and Eastern branches. The Elizabeth River Project with the Living River Trust and multiple public and private partners cleaned up two phases of similar contamination at Money Point in Chesapeake, while Columbia Gas has addressed contamination at a site alongside Swimming Point in Portsmouth. As this plan is being finalized, the Living River Trust is completing a $6 million clean up of sediments in Paradise Creek. Most of the projects have resulted in significant reductions of cancer in bottom-dwelling fish along with a return of numbers and diversity of fish.

Remaining legacy contaminants including polycyclic aromatic hydrocarbons (PAH) and polychlorinated biphenyls (PCB), both toxic to marine life and also posing human health risks resulting in local fish advisories for some fish species. Continued cleanup of contaminant "hot spots" is needed to help restore a healthy and vibrant marine community.

10-YEAR GOAL

Reduce cancer in the indicator fish, the mummichog, to background levels in known hotspots by reducing polycyclic aromatic hydrocarbon (PAH) levels in river sediment to below 45 parts per million (a level at which adverse effects are seen in marine life).

5-YEAR GOALS

Achieve sediment cleanup goals for Paradise Creek and Atlantic Creosote in addition to cleanups already achieved. Make progress toward developing restoration plans for all known hotspots and identify known data gap areas with the sediment remediation partnership group that meets regularly.

Improve data collection and dissemination. The Elizabeth River Project Sediment Remediation Partnership coordinate an effort to identify sediment contaminant data that meets the quality objectives of the new NOAA DIVER data base program and begin uploading the data so it can be incorporated into research and mapping tools.

REDUCE SEDIMENTS & TOXICS ACTION STEPS

1. **Elizabeth River Project convene its Elizabeth River Project's Sediment Remediation Partnership (ERPSRP) at least annually to coordinate efforts.** Sediment steering committee members participating in the ERPSRP partnership may need to meet more frequently to:
    - Explore restoration funding opportunities.
    - Advance action item efforts.
    - Coordinate sediment data base development with NOAA. Coordinate DIVER Database with NOAA and VIMS.
        - Work with the NOAA DIVER and VIMS database groups to develop an Elizabeth River watershed database layering mapping tool.
        - Identify funding sources being used to evaluate sediment quality on the Elizabeth, (NIH, ODU BIBI funding, annual State monitoring fund, USACE 501 program, others).
        - Identify organizations collecting sediment data in the Elizabeth and create a central data repository where copies of the data can be saved.
        - Perform updated sediment sampling in the Western Branch to determine if its score card grade can be improved.

"One thing I am excited about is the power of Elizabeth River Project to bring together all these different people from different affiliations. Pollution does not know political borders, or project borders..."

Michael Unger, Professor, VIMS; chair, Sediment and Toxics Committee Chair for this plan

What you can do.

1. Invite scientists from the Living River Trust to speak to your civic league about the importance of the river bottom and latest ways the "goo" is going.

2. ERPSRP coordinate the review and update of the current sediment "hot spot" list. Add Department of Defense and commercial facilities as they become known. Develop social marketing messages highlighting stories from wildlife rehabilitators and bird toxicology studies.public on how microplastics impact the river (from water quality).

3. Regional partners work together to address remaining legacy contaminant "hot spot" areas including:

- Scuffletown Creek, Republic Creosote, Money Point Phase 3; all slated for clean up by The Port of Virginia as mitigation sites for the loss of healthy bottom with the expansion of Craney Island.
- Atlantic Creosote: Investigation is currently underway by Kinder Morgan.
- Paradise Creek: Cleanup is currently underway by Living River Trust.
- Peck Iron & Metal: Investigation is currently underway by US EPA and a cleanup solution will be developed for Peck Iron and Metal by 2025.
- **Living River Trust to evaluate and identify the next sediment mitigation site for advance mitigation credits.** The Living River Trust is a non-profit formed to provide an alternative for developers to off-set impacts to the bottom of the river by funding projects that mitigate the impacts by cleaning up unhealthy river bottom. Advance mitigation credits means credits provided to an organization like the Trust prior to performing the mitigation work.

Dave Koubsky, field manager, oversees a "goo" removal project. Half the hotspots are now addressed.
Photo by Elizabeth River Project/Joe Rieger

ACTION 6

CREATE AND PROTECT HEALTHY WILDLIFE HABITAT, despite rising sea levels.

Green heron visits the Elizabeth. Photo by David Gibson

BACKGROUND - FROM ONE FISH TO RECORD-SETTING NUMBERS

The head of Virginia's Department of Environmental Quality will never forget the paucity of his catch. It was decades ago when the young biology student was assigned to catch fish from the Southern Branch of the Elizabeth River.

"I vividly recall trawling for an hour and a half and we got one toad fish," David Paylor told a recent gathering.

Fast forward. By 2021, not only were many species of fish abundant throughout the Elizabeth, including large shrimp. Dolphins had become a common sight in every river branch. River otters were back and bald eagles.

Partners on the Elizabeth now lead the state on restoration of oyster habitat. The Lafayette and Eastern branches of the Elizabeth recently became the first two Virginia tributaries to achieve goals set by bay scientists for full restoration of oyster beds. With more than 50 million oyster larvae placed on dozens of new reefs, the emphasis shifts in this plan to other forms of habitat.

10-YEAR GOALS:

With rising seas, ensure upward marsh migration pathways exist for native wetlands and living shoreline restoration projects.

Net increase in the tree canopy by 5% above existing canopy cover in environmentally and demographically vulnerable areas identified in the EJ mapping tool.

Conservation Landscaping and Living Shorelines are the accepted standard for residential, commercial and public shorelines and gardens, measured by the adoption of standards, policies and guidelines by localities (local comprehensive plans, landscaping ordinances, etc).

Create or restore 10 acres of tidal wetlands, 4 acres of oyster habitat, and 15 acres of riparian buffer at River Star Homes and Businesses.

5-YEAR GOALS:

Identify focus areas where habitat migration can take place and plan shoreline restoration projects that consider rising seas and changing conditions.

Publish Next Generation Habitat Guidelines for conservation landscaping, protecting shoreline habitats, and how to implement restoration actions.

Establish regional social marketing campaign(s) for trees, conservation landscaping, living shorelines, and greenways that promote and support adaptive habitats.

Greenways/blueways working group is established and strategically making connections between habitats, recreation trails and green infrastructure for stormwater management across the region.

The cities of Chesapeake and Portsmouth have developed **Green Infrastructure plans** (also see water quality).

Create or restore 5 acres of tidal wetlands, 2 acres of oyster habitat, and 10 acres of riparian buffer at River Star Homes and Businesses.

Photo by Elizabeth River Project

"It's so uplifting to work with so many people from such diverse affiliations who care so much about habitats, and who also recognize how important health habitats are for all the people in the watershed."

Karen Duhring, Coastal Scientist, VIMS; Habitat Committee Chair for this plan

ACTION STEPS:

1. **Participating partners and localities restore and protect shoreline forests and wetlands in current and future locations,** giving priority to areas that have space for shoreline habitat to migrate up the shore as sea levels rise.
    - Make maps & visualizations: Identify focus areas where habitat migration can take place and plan shoreline restoration projects that consider rising seas and changing conditions.
    - Establish a Greenways/blueways working group to make watershed-wide map(s) available of existing wetlands, tree canopy, living shorelines and oyster restoration projects with visualizations of connections between them and predicted migration pathways.
        - Utilize Natural and Nature-Based Feature migration models and visualizations from VIMS and City of Norfolk to identify upward migration pathways and prioritize restoration projects
        - Utilize flood mapping data from Elizabeth River Environmental Justice Mapping Tool and Catch the King community science network
        - Align w/ existing efforts including Atlantic Coast Joint Venture for Birds https://acjv.org/, USGS Breeding Bird Atlas, CZM grant to VIMS, DWR, DCR and VCPC to look at shifting habitats in the face of climate change (Conservation Targeting for Resilience).
        - Also identify areas that are important for open/shallow water habitat restoration or protection (mudflats, oyster habitat, Essential Fish Habitat, future SAVs).
    - Identify a lead partner or partners to publish Next Generation Habitat Guidelines: Adaptively restore and protect wetlands, other shoreline habitats including oyster reefs, and upland habitat in target areas.
        - (From sea level subcommittee) Apply next generation restoration sciences and adapt restoration to climate change - for instance if higher salinity, perhaps new areas for oyster restoration can be feasible. Encourage restoration of future high marsh areas with appropriate plant species.
        - Include strategic site selection, adaptation plan and new innovations as part of engineering/design process tied to analysis of water rising over time:
            - Thin layer application of sediments onto wetlands to allow them to adapt to sea level rise
                - Creative and beneficial use of dredged sediment, shorelines, thin layer spreading, beaches.
                - Removal of failing bulkheads and conversion into living shorelines.
        - Identify and pursue opportunities to develop new habitat in existing upland.
        - Conduct outreach to localities to orient them to adaptive habitat maps and data, so they know where to focus space preservation efforts behind current wetlands and marshes (to provide areas for upward migration in the future).
        - Further develop contractor base for building and designing living shorelines and buffers in partnership with Chesapeake Conservation Landscaping Council's Chesapeake Bay Landscape Professionals program to expand training and guidelines for design, installation, maintenance/monitoring, cost-share support, and technical assistance.

Photo by Elizabeth River Project/Casey Shaw

- All relevant partners normalize living shorelines: Make living shorelines preferred, affordable and practical through social marketing.
  - Continue momentum of successful living shoreline funding assistance, design & implementation programs including River Star Homes, River Star Businesses, Living Shorelines Collaborative, Virginia Conservation Assistance Program (VCAP).
  - Develop regional living shorelines social marketing campaign to increase awareness, preference, and acceptance of living shoreline implementations. Tell stories about successful living shoreline projects.
  - Increase number of living shoreline demonstration projects in Portsmouth & Chesapeake.
  - Include bird-viewing platforms in habitat restoration projects when possible to increase public awareness and promote community science and research. Recruit public engagement help from Virginia Master Naturalists and local birding groups.

2. Partners collaborate to save as many large trees as possible, while also planting new trees.

- Increase tree canopy in environmentally and demographically vulnerable areas by 5% above existing canopy cover through community partnerships to provide cooling, filter toxins, and soak up rainwater. According to the EJ mapping tool, these communities only have an average baseline 10% tree canopy within the Elizabeth River watershed. Use EJ Mapping Tool to target neighborhoods with low tree canopy, high surface temperatures. Focus on areas where tree canopy has historically been lower and where the need for urban heat island mitigation is the most in need, working to build trust and education with community members to increase tree canopy. Plant at bus stops to provide shade.
  - Funding: The Virginia Trees for Clean Water Grant is intended to encourage the creation of long-term sustained canopy cover to improve water quality across the state. It is used to fund tree planting efforts that raise public awareness of the benefits of trees and impacts on water quality. The Urban and Community Forestry Assistance Grant encourages projects that promote the protection and enhancement of urban and community forest ecosystems, tree planting, the care of trees, and education on tree issues in cities, towns and communities. This program exists to encourage local government and community involvement in creating and supporting long-term and sustained urban and community forestry projects and programs at the local level. Past proposal categories have included Urban Tree Canopy Assessments, Tree Inventories for Local Government, and Urban Heat Island Mitigation.

Youth Conservation Interns plant and care for native trees at Paradise Creek Nature Park.
Photo by Elizabeth River Project/Casey Shaw

- Partners collaborate on a social marketing campaign for trees. Promote the multiple strong benefits of trees both as stormwater treatments, habitat value, and enhancements to well-being. Advertise value and benefits of mature trees. Neighborhoods with lots of trees have lower crime rates, less air pollution, lower energy costs, and higher property values than those without trees. Walking among trees can improve health, and even viewing trees through a window can speed patient recovery times.
- Protect and maintain existing tree canopy while pursuing new tree plantings. Establish a regional tree working group to work with localities, non-profit organizations, homeowners associations, and other partners throughout watershed to maintain and increase the tree canopy where possible. Help localities adopt tools to protect large trees, replace canopy where trees must be removed.
- Promote awareness and importance of consulting with ISA Certified Arborists, including the Tree Risk Assessment specialty for evaluating if trees pose a hazard or not.
- Support and expand colonial waterbird nesting surveys to locate suitable nesting trees. Expand Notable Tree Program beyond Virginia Beach Support development of Chesapeake Urban Forestry Management Plan. Support 2nd round of approval on tree legislation in 2022 VA General Assembly legislation; if passed, localities can establish higher tree canopy goals for new developments, establish tree banking programs, and give stormwater credits for preserving mature trees.
- Push for legislation to allow localities to require permits to remove trees (see DC ordinance).

Potential Partners: Local municipalities, Chesapeake Tree Board, Norfolk Urban Forester, Trees Virginia, Friends of Indian River, Green Infrastructure Center, Chesapeake Tree Board, Virginia Master Gardeners and Master Naturalists, Norfolk Tree Commission, Friends of Norfolk's Environment, Chesapeake Environmental Improvement Council, Elizabeth River Project, HRPDC, local civic leagues and homeowner's associations.

3. Regional partners promote conservation landscaping for homes, businesses, and local governments.

- Disseminate habitat-specific plant & tree lists. Augment existing native plant guides to update them regularly with plants & trees available in the local trade. Include plants important for birds and wildlife. Identify funding another printing of Native Plants for Southeast Virginia.
- Support native plant nurseries. Support and promote local plant nurseries who share the vision, such as Southern Branch Nursery and Lady Fern's Native Plants. Implement branding for Elizabeth River plants at local retailers.
- Support native plants in hands-on landscape practice and promote low input lawns that minimize use of fertilizers and herbicides. Encourage leaving leaves in fall, composting, and no mow zones.
    - Develop DIY templates (similar to Maryland's Book for the Buffer) for native landscape designs for specific settings
    - Offer Landscape for Life course from the Lady Bird Johnson Wildflower Center, DWR Habitat at Home, and other education programs with partners Butterfly Society of Virginia, Virginia Master Gardeners & Master Naturalists Virginia Native Plant Society, Tidewater Beekeepers, Virginia Tech - Hampton Roads AREC, HRPDC, Norfolk Botanical Garden, Fred Heutte Center, utilizing the Resilience Lab as an educational venue
    - Examine city nuisance weed ordinances to clarify how conservation plantings are permitted. Update planting lists recommended for new developments by local Cities.
    - Support community gardens as means to introduce native plants to support pollinators and increase food yield, especially in food dessert communities.
    - Highlight businesses that adopt conservation landscaping practices, especially those that are high visible such as shopping centers and universities.
    - Encourage municipalities and HRPDC to promote Leave the Leaves campaign.
    - Work with municipal groundskeepers to adopt conservation landscaping practices to lead by example on public property (i.e. no mow zones, native plantings, leaving leaves)
    - Promote conservation landscaping funding assistance through programs such as River Star Homes, River Star Businesses, and Virginia Conservation Assistance Program
    - Potential funding: Chesapeake Bay License Plate fund

Conservation landscaping at Paradise Creek Nature Park. Photo by Elizabeth River Project/Casey Shaw

4. Identify a lead partner to set up a regional working group to develop a regional Blueways-Greenways plan for achieving corridors of contiguous habitat, also providing biking/walking trails where appropriate.

- Expand on the current efforts of the Living River Trust – the only locally based land trust in South Hampton Roads - to develop a corridor plan and ID and protect large, minimally developed parcels.
- Set up regional working group to develop Blueways-Greenways Plan, engaging partners and plans such as Elizabeth River Trail, pending Chesapeake Citywide Trails and Open Space Connectivity Plan, Portsmouth Bike Plan, South Hampton Roads Trail (Suffolk to Virginia Beach), Dept of Conservation & Recreation, HRPDC, National Park Service (Rivers and Trails Program)
- Expand connectivity for terrestrial and aquatic habitats from DCR ecological core parcels, as mapped in ConserveVirginia.
- Update DCR natural heritage resource elements occurrence database, i.e. rare plant and animal species populations, and exemplary natural communities.
- Considering the high level of existing development separating remaining ecological cores, look at creative ways to connect areas with conservation landscaping and prioritized tree planting across neighborhoods and business districts. Human connections may include trails, bikeways, sidewalks, and even public transit connections (ferries, light rail, buses).

5. Create a connective oyster habitat structure throughout the Elizabeth River.

- Create 20 acres of oyster habitat throughout the Elizabeth River to connect relic and restored oyster reefs on the Lafayette, Eastern Branch, Western Branch, and main stem of the Elizabeth River to maximize the larval flow of oysters and overall oyster reef success. Two of these acres will be accomplished through next generation shoreline restoration projects such as hybrid living shorelines.
- Engage with partners NOAA and VIMS to map restorable bottom for oyster habitat on the Western Branch of the Elizabeth River.

Oysters rebound on the Lafayette.
Photo by Elizabeth River Project/Casey Shaw

6. Partners aid localities to make sound decisions, while also increasing their capacity, as they phase in state changes to the Chesapeake Bay Preservation Act over the next three years.

- Support preservation of mature trees, coastal resilience and sea-level rise adaptation activities through CBPA amendments.
- Join locality working groups and encourage participation in public meetings in conjunction with HRPDC and the VA Coastal Policy Center.
- Identify funding to grow localities' staff for CBPA regulation.
- Help disseminate public education about regulations and regulatory process for realtors and land owners.
- Conduct case study on how green infrastructure can reduce pollution in environmentally and demographically vulnerable communities.

7. Partners help Chesapeake and Portsmouth develop Green Infrastructure Plans (also see water quality).

- Chesapeake and Portsmouth consider enlisting the Green Infrastructure Center to develop plans similar to City of Norfolk Green Infrastructure Plan for stormwater BMPs and other urban greenscapes in Chesapeake and Portsmouth.

What you can do.

1. Increase the wildlife habitat value of your yard, business or school grounds. Carry out a native plant and tree installation with assistance from Elizabeth River Project. Help with planning and funding may be available through area partners. 757-399-7487, elizabethriver.org.

Explore **THIS GUIDE** To local native plants.

Check for plant giveaways from local cities, Master Gardeners and Elizabeth River Project.

2. Get inspired. Visit Paradise Creek Nature Park, 40 acres of wildlife habitat restoration in progress through a partnership of Elizabeth River Project and the City of Portsmouth (1141 Victory Blvd). Watch for park workshops, volunteer events and lectures to get involved.

3. Get involved as a community scientist. Participate in **OspreyWatch,** the **Great Backyard Bird Count** and the **Crab Trap App**

DO SOMETHING BEAUTIFUL

The Elizabeth River Project is the non-profit leading community-wide implementation of this plan through membership support.

JOIN US.

ElizabethRiver.org

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