

EASTERN BRANCH ENVIRONMENTAL RESTORATION STRATEGY

Prepared by the Eastern Branch Environmental Restoration Strategy Committee
Convened by the Elizabeth River Project



FINAL ADOPTED BY BOARD - NOVEMBER 17, 2014



STRATEGY MADE POSSIBLE BY

This planning process was convened by the Elizabeth River Project, elizabethriver.org, a non-profit working to restore the Elizabeth River. Special thanks to sponsors including National Fish & Wildlife Foundation, the Bank of America, the Chesapeake Bay Funders Network, Kinder Morgan Terminals and generous donors to the Elizabeth River Fund.

THE VISION

A healthy, enduring Eastern Branch, with abundant habitat supporting thriving wildlife, will be a beloved destination for residents. It will connect diverse neighborhoods, sustain model industries, and provide recreation; with well-coordinated support across three cities.

- Steering Committee



Students aboard the Elizabeth River Project's Learning Barge discover the Eastern Branch. The Learning Barge docks frequently at Grandy Village Learning Center, one of the little-known treasures of this "lost" branch.

INTRODUCTION

RESTORING THE ELIZABETH'S LOST BRANCH

A stakeholder planning team convened by the non-profit Elizabeth River Project (elizabethriver.org) prepared this plan to restore the environmental health of the Eastern Branch of the Elizabeth River, as a key step toward restoring the larger Elizabeth.

One of the four main tributaries of the urban Elizabeth River, the Eastern Branch exhibits some of its poorest conditions, as well as some of its richest history. However, the planning team came to know this as the Elizabeth's "invisible" or lost branch.

Although the Eastern Branch is home to more than 160,000 residents across three cities – Norfolk, Chesapeake and Virginia Beach – and once welcomed sailing ships at the long-vanished port of Kemps Landing, this branch now flows mostly unseen by Hampton Roads. You might glance it briefly from bridges or aboard the Tide, Norfolk's new light rail system, which follows the Eastern Branch's for much of its path; or you may be lucky enough to live alongside these tidal waters. Otherwise, to find the Eastern Branch today, you would need purposely to seek it out by finding little-known parks – notable is the 91-acre Indian River Park in Chesapeake - or by following back roads to dead-end overlooks.

Our team considered this lack of awareness to be the top contributing factor to neglect of the Eastern Branch – thus a priority focus on public outreach. Other actions seek to restore the once abundant Eastern Branch oysters, wetlands and forests; reduce polluted runoff, especially from some of the vast parking lots found here at sites such as Military Circle; address a large number of septic systems, and address contaminated river bottom at one known industrial site, while seeking to identify any others.

CALLING THREE CITIES; HOMES, BUSINESSES, SCHOOLS

The Elizabeth River Project will take the lead to coordinate implementation of the plan, but our small non-profit will not succeed without the full buy-in of the larger community. This plan is intended to support the work of the Cities of Chesapeake, Norfolk and Virginia Beach as they strive to meet new environmental requirements, and as they update their comprehensive plans. The plan also depends on partnerships with state and federal governments and fellow non-profits. But most especially, its success depends on the voluntary efforts of homeowners, businesses, and schools.

Find your starring role. Join the Elizabeth River Project's River Star Homes, Businesses and Schools. These free programs offer easy entry and great resources, from grant funds to help you add native plants or rain barrels to free technical advice and great public recognition for businesses. *Find out if star status is right for you at www.elizabethriver.org or call 757-399-7487.* The advance guard of River Star Homes already participating on the Eastern Branch are too numerous to list, but we offer kudos to the following schools and businesses already participating on the Eastern Branch:

JOIN THESE EASTERN BRANCH STARS

Arrowhead Elementary School **
Booker T Washington High School **
Bowling Park Elementary School **
Campostella Elementary School **
Chesterfield Academy**
Christian Broadcasting Network*
College Park Elementary School **
Colonna's Shipyard*
Fairfield Elementary School **
Fairlawn Elementary School **
Founders Inn & Spa*
General Dynamics NASSCO-Norfolk*
Georgetown Primary School **
Hampton Roads Transit*
HRSD*
Ingleside Elementary School **
Indian River High School **
Indian River Middle School **
Kempsville Elementary School **
Kempsville Middle School **
Kempsville High School **
Lake Taylor Middle School **
Luck Stone Berkley Yard*
Lyon Shipyard*
Marine Hydraulics International*
Norfolk Highlands Primary School**
Norfolk Technical Center**
Norfolk Tug*
NRHA's Grandy Village and Learning Center*
Point O'View Elementary School **
Poplar Halls Elementary School **
Providence Elementary School **
Sparrow Road Elementary School **
St. Helena Elementary School **
Thurgood Marshall Elementary School **
Tidewater Park Elementary School **
Vulcan Norfolk Sales Yard*
Vulcan Westminster Stone & Recycling Yard*
William H. Ruffner Academy **
Woodstock Elementary School **

*** River Star business and government facilities documenting environmental results with Elizabeth River Project**

**** River Star schools documenting environmental stewardship projects with Elizabeth River Project in 2013/14**

THANKS TO A DEDICATED PLANNING COMMITTEE

A diverse team of almost 90 people representing science, government, business and citizen interests met from February 6, 2014 to August 6, 2014 to identify and prioritize the goals and strategies prescribed. Six months is a short time for planning an initiative of this size. Elizabeth River Project expresses deepest thanks to the team for tireless research and fruitful debate to achieve consensus on the plan presented. The team's work was ably facilitated by Dr. Frank Dukes, University of Virginia Institute for Environmental Negotiation, with thanks to a capacity-building grant of the Chesapeake Bay Funders Network.

A POTENTIAL CATALYST PROJECT

The City of Norfolk and Elizabeth River Project are exploring the potential for restoring almost a mile of under-used, degraded, but highly visible waterfront just east of downtown at the mouth of the Eastern Branch, in the vicinity of Harbor Park stadium. This site has the potential to jump-start interest in the larger restoration of the Eastern Branch and demonstrate many aspects of this plan, from public outreach to habitat restoration and water quality improvements.



Alongside Harbor Park stadium, a long stretch of neglected downtown shoreline presents large opportunities to demonstrate all the principles of this plan, from wetland and oyster restoration to redevelopment that anticipates sea-level rise.

EASTERN BRANCH – FAST FACTS

Population: 166,265 (2010 census); 56,000 households.

Cities: Chesapeake, Norfolk, Virginia Beach, VA

Size: About 40 square miles of “watershed” or land draining into the Eastern Branch

Historic Significance: The headwaters of the Eastern Branch once formed a colonial port for sailing ships known as Kemp’s Landing (now Kempsville). In November 1775, John Ackiss was killed there by Royal Governor Lord Dunmore’s militia in the “Skirmish of Kempsville.” Ackiss became the first Virginian casualty of the Revolution.



The Colonna’s houseboat, permanently marooned by a hurricane, is just one of the fascinating features that make the Eastern Branch fascinating.

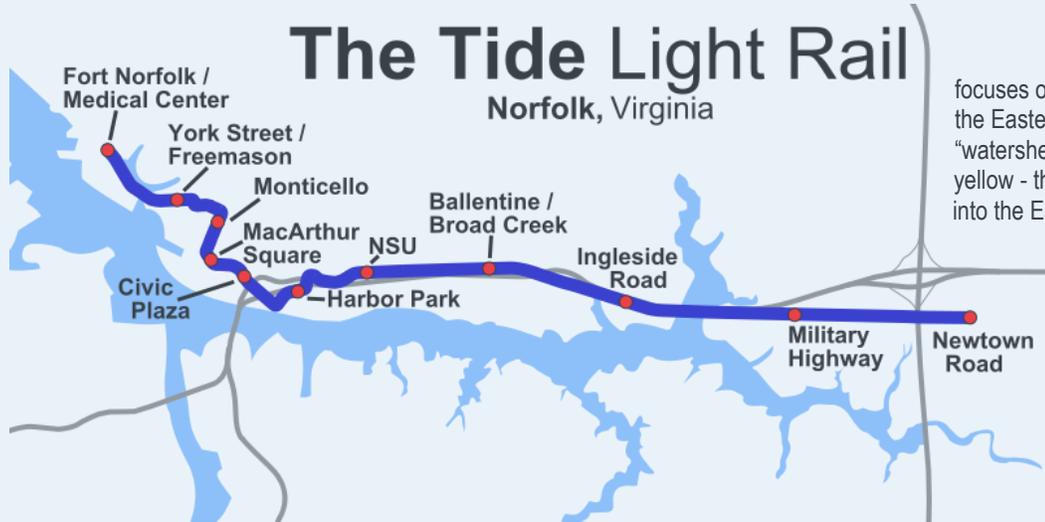
Former Oyster Mecca: Such abundant oyster houses once lined the Eastern Branch that “great quantities of oyster shell” (Al Philips memoirs) were used to form the foundation of “Shell Road,” now Indian River Road in Chesapeake and Virginia Beach. Oyster harvest has been banned on the Eastern Branch, as in the rest of the Elizabeth, since 1925.

A Unique Vessel: On Seneca Avenue in Chesapeake rests a multi-story wooden houseboat, marooned in the 1930s by a hurricane. The houseboat is maintained by the Colonna family of the Eastern Branch’s Colonna’s Shipyard.

Oldest Family-Owned Shipyard: Founded in 1875, Colonna’s is the oldest family-owned private shipyard in the United States. Keeping abreast of modern times, the yard recently acquired the world’s largest marine travel lift.

Residents Can Ride the Tide: The Tide, Norfolk’s new light rail system, follows the Eastern Branch from its mouth at Harbor Park to the Virginia Beach line, making alternate transportation a ready environmental choice for Eastern Branch residents – especially when combined with a new Amtrak station at Harbor Park.

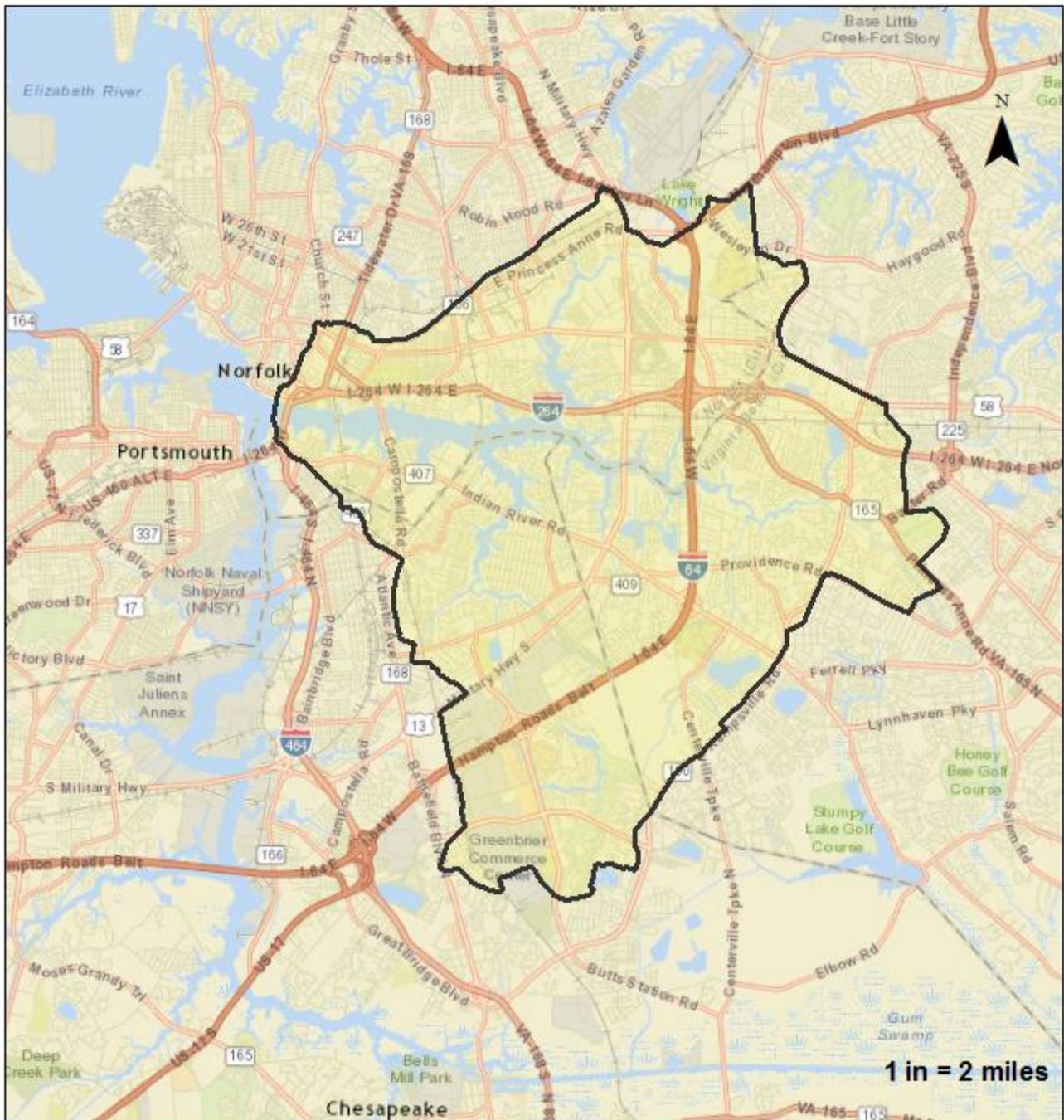
This plan restoring Branch indicated in area draining Branch.



focuses on the Eastern “watershed,” yellow - the into the Eastern

Norfolk’s light rail system follows the Eastern Branch to the Virginia Beach border.

EASTERN BRANCH WATERSHED



A watershed is the area that drains into a waterway when it rains, conveying polluted “runoff” from streets, parking lots, lawns and other surfaces. If you live or work in the area outlined in black, you can have a direct impact on improving the Eastern Branch of the Elizabeth River. Learn more: ElizabethRiver.org.

ACTION 1 – TELL THE STORY, ENLIST THE PUBLIC.

CHALLENGE:

The Eastern Branch is the “invisible” or lost branch of the Elizabeth River. Generally you don’t see it except in glimpses, passing over bridges. But this branch is bursting with history waiting to be told – including the newest chapter, its restoration.

The planning committee identified the No. 1 challenge for restoring the Eastern Branch: Lack of information – including a lack of understanding of the current and historic health of the river. As a result, many residents believe this branch is dead and always will be. They don’t know how to help. They aren’t aware of even the limited public access opportunities. And communication is hampered by the fact that this branch flows through three municipalities – Norfolk, Chesapeake and Virginia Beach; each with its own interests and communities.



The Steering Committee visits Carolanne Farm Park on a tour of the Eastern Branch. Rogard Ross, chair of the Public Involvement Work Group, gestures to underscore the importance of more public access along the branch.

GOAL 1: SHARE THE STORY OF THE EASTERN BRANCH WITH ITS RESIDENTS.

BY 2018:

1. Publish a brief, clear summary of the Eastern Branch story and what people can do to help, targeted to a general audience (Elizabeth River Project take the lead, with partners including city parks and recreation departments). Include a map of public access points and participating River Star schools and businesses. Distribute at least to all 34,000

homeowner-occupied households (40,000 copies recommended), through mailings and placement in libraries and other public buildings (also post electronically). A self-mailer is envisioned. Use expert marketing guidance from groups such as Water Words That Work and pilot the publication on a small scale first. Include give-away items to spark interest. Potential funding: Request Eastern Branch businesses to sponsor this project. Promote on HR Green's blog.

2. If funding is available, consider a larger marketing campaign to tell the Eastern Branch story, through video, social media, billboards, radio, smartphone apps.
3. Nurture grassroots leadership. Consider a leadership workshop to train citizens to take leadership roles in telling the story and implementing restoration projects on a neighborhood scale. Potential partners: Chesapeake Bay Foundation's VOICES program; Master Gardeners, Master Naturalists.
4. Hold a "Watershed Forum" every 2-3 years to bring together stakeholders in the restoration of the Eastern Branch.
5. Ask the Virginia General Assembly to rename a portion of I-264, "the Eastern Branch Expressway," following the example of the Western Branch Freeway.
6. Add signs at bridges and streams, identifying the Eastern Branch of the Elizabeth River.
7. As noted in Action 2: Implement public art as part of multi-pronged, high profile restorations at one or more bridge approaches, and restore demonstration sites as a way to educate and engage the public.
8. Consider an Elizabeth River song, celebrating its branches including the Eastern Branch, to unveil at RIVERFest annual event of Elizabeth River Project.

GOAL 2: IMPROVE PUBLIC ACCESS ALONG THE EASTERN BRANCH.

Public access is a priority for creating an environmentally engaged community. While the Eastern Branch offers pockets of access through scattered parks and canoe launches, these are mostly off-the-beaten-path and are insufficient for the size and diversity of this branch's population. Southern portions of the Eastern Branch in particular lack boating access.

BY 2018:

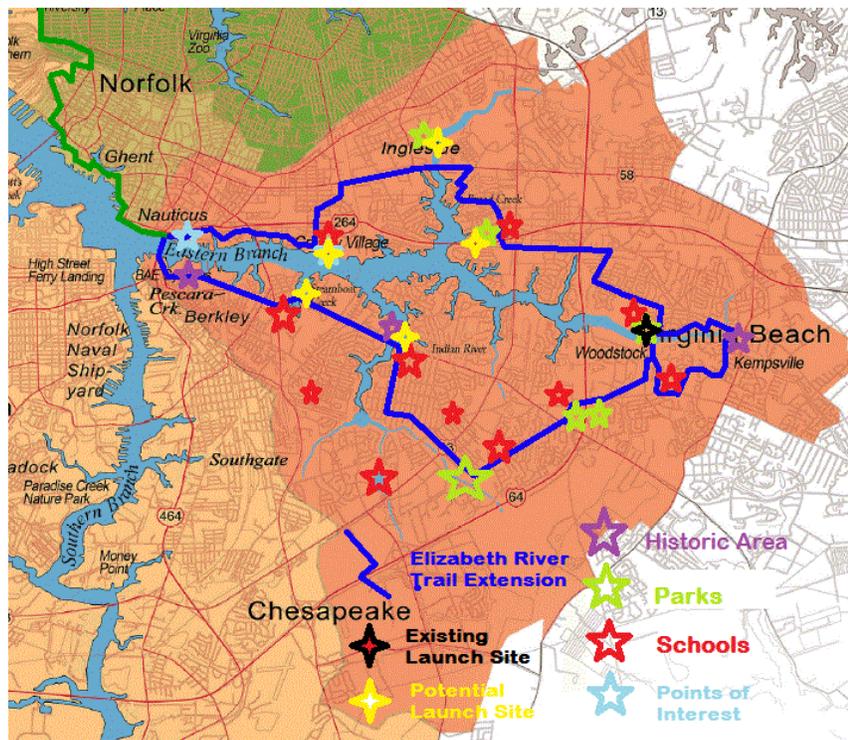
1. **Include existing public access points on the map to be distributed to all homeowners as part of Goal 1.** Include parks and boat launches. Existing access points include Harbor Park stadium and Poplar Hall Park in Norfolk; Carolanne Farm Park and Arrowhead Elementary School grounds in Virginia Beach and Indian River Park (the largest public park in the watershed, at 91 acres, in Chesapeake), and a little-known canoe launch adjacent to Harbor Park.
2. **Evaluate boating access.** Enlist partners such as Chesapeake Parks and Recreation Dept. and volunteers to conduct a site evaluation to find deficiencies such as broken piers, and opportunities such as existing parks that could easily be retrofitted with kayak launches. Consider Steamboat Creek, Indian River, Broad Creek. Potential partners: City parks and recreation departments, Elizabeth River Project, Friends of Indian River, kayak groups.

Potential funding: VA Dept. of Game and Inland Fisheries; NOAA Coastal Zone Management, Cities.

3. **Extend the Elizabeth River Trail to the Eastern Branch.** Finalize an optimum route and identify funding (consider federal ISTEPA funding, which Chesapeake has secured successfully for other extensive trails) to extend the Elizabeth River Trail, a multi-use trail now located in Norfolk, to the Eastern Branch, linking together river access points, urban parks, and other points of interest. Partners: Friends of Indian River, parks and recreation departments of cities.
 - Possible route could cross the river from Harbor Park to Berkley on the pedestrian crossing next to I-264 and then continue along Indian River Road through historic Berkley, past Steamboat Creek, past historic Oaklette in Chesapeake, crossing the Indian River, cutting through Norfolk Highlands to connect with the existing trail system in Indian River Park and Conservation Area. From Indian River Park, the trail could follow along the power line corridor to Level Green Park, Providence Park, and Woodstock Park in Virginia Beach before continuing along neighborhood streets to historic Kempsville. The trail on the north side of the river would negotiate its way back from Kempsville, perhaps follow along the Light Rail route to Poplar Park and then go around Broad Creek to make its way back to Grandy Village, Chesterfield Heights and back to Harbor Park.

BY 2024:

1. Complete extended Elizabeth River Trail
2. Establish at least 1 new canoe/kayak public access site on the Eastern Branch, particularly along the south shore of the river.



Green indicates the existing Elizabeth River Trail. Blue proposes a possible expansion through historic sites and potential new access points around the Eastern Branch (courtesy, Rogard Ross, Public Involvement Work Group).

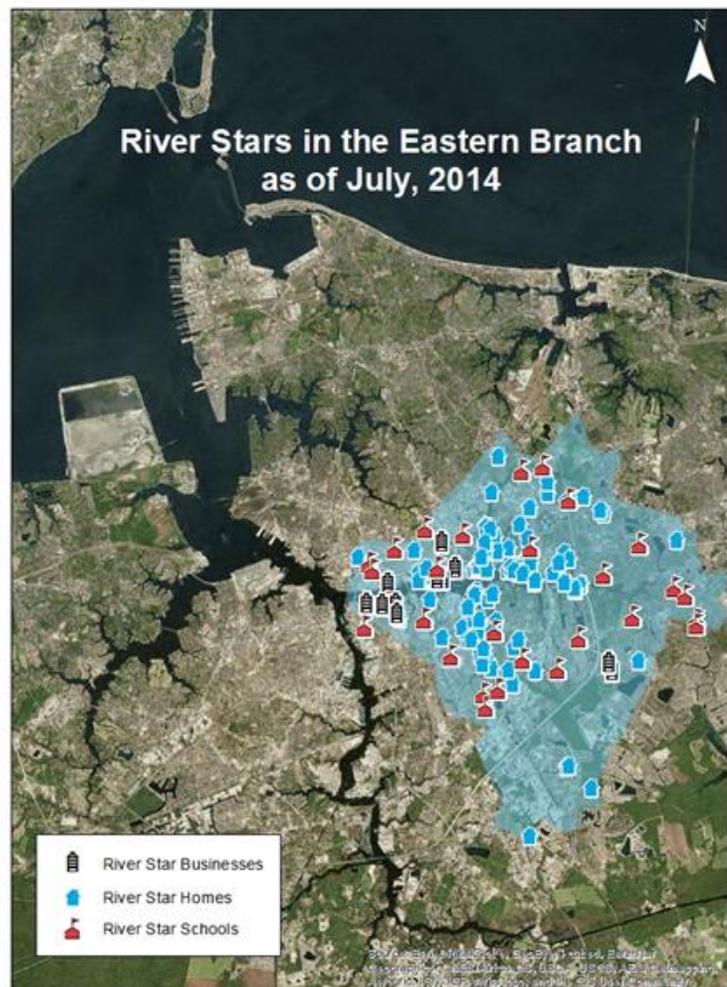
GOAL 3: ENGAGE THE EASTERN BRANCH COMMUNITY IN ENVIRONMENTAL STEWARDSHIP THROUGH THE RIVER STAR PROGRAMS.

The Elizabeth River Project's free River Stars programs - for homes, schools, and businesses - have been successful at promoting environmental stewardship in other focus areas on the Elizabeth River. Elizabeth River Project now has grant and City of Norfolk funding to help River Star Homes in the Eastern Branch area pay for environmental improvements to their yards, while the non-profit continues to offer free assistance and public recognition as well to businesses and schools, with a new focus on the Eastern Branch for these audiences also.

When homeowners on the Eastern Branch agree to 7 simple steps, from picking up after their dogs to keeping grease out of the sink (www.riverstarhomes.org), they receive a beautiful free yard flag and qualify for funding assistance for on-the-ground efforts ranging from super-sized, 132-gallon rain barrels hugely discounted to \$75 including installation, to lawn makeovers to reduce dependence on chemicals (Chesterfield Heights residents pay only \$10 per lawn), to shoreline plantings and "rain gardens" (typically Elizabeth River Project pays as much as half the cost). Find out more at riverstarhomes.org or call Sara Felker, 757-399-7135, sfelker@elizabethriver.org.

River Star Businesses receive free technical assistance to plan and carry out voluntary efforts in pollution prevention and wildlife habitat. Results must be significant relative to the size and nature of operations and must pass peer review for recognition at an annual luncheon of business leaders each January. Find out more from Pam Boatwright, Pam Boatwright, pboatwright@elizabethriver.org, 399-7487; www.riverstarbusinesses.org.

River Star Schools, meanwhile, carry out hands-on environmental projects throughout the school year, as selected by each teacher. Schools report results each Earth Day. Find out more at elizabethriver.org, or contact Robin Dunbar, 399-7132, rdunbar@elizabethriver.org.



BY 2018:

1. **Recruit at least 1,000 River Star Homes in the Eastern Branch** (currently 177 of Elizabeth River Project's 2,200 River Star Homes live in the Eastern Branch sub-watershed). Consider targeted communications for different communities within the sub-watershed.
2. **Recruit at least 5 additional River Star Businesses in the Eastern Branch** (11 of the current 109 River Star Businesses are on the Eastern Branch).
3. **Recruit at least half of the schools** in the Eastern Branch to be River Star Schools (27 of 67 schools in the Eastern Branch area currently participate).
4. **Invite representatives of faith groups** to meet with the steering committee for River Star Businesses to consider whether creation of a River Star Faith program would be effective and whether resources would be available to address any ways that faith groups may differ from businesses, homes, and schools.



Cathy Roberts is a River Star Home on the Eastern Branch. Join at RiverStarHomes.org.

BY 2024:

1. **Recruit at least 2,000 River Star Homes in the Eastern Branch**
2. Recruit all of the schools in the Eastern Branch to be River Star Schools
3. Recruit a total of 20 businesses in the Eastern Branch to be River Star Businesses

GOAL 4: ESTABLISH A FREE FESTIVAL CELEBRATING THE EASTERN BRANCH OF THE ELIZABETH RIVER

An annual free festival, Lafayette RIVERFest, was successful from 2011-2014 to create momentum when the Elizabeth River Project introduced its plan for the Lafayette branch of the Elizabeth River, with audiences swelling from 1,500 the first year to 4,000 by 2014. The Elizabeth River Project board has decided to reconstitute RIVERFest to celebrate the entire Elizabeth River (Elizabeth RIVERFest) and move it to celebrate the Eastern Branch in 2015. At least in the first year(s) as this plan is introduced, a special focus will be on celebrating the rich history and unique importance of the Eastern Branch, while promoting this plan.

BY 2018:

1. Elizabeth River Project to reconstitute a steering committee to plan the festival with participation from all three municipalities. Finalize a location on the Eastern Branch for the first year. Possibilities include Chesterfield Heights/Grandy Village, Carolanne Farm Park, Indian River High School, Harbor Park in Norfolk.

BY 2024:

1. Consider if there are resources and partners to continue a free festival focusing on the Eastern Branch, if the need is no longer met by the larger RIVERFest.



ACTION 2 – RESTORE WILDLIFE HABITAT

CHALLENGES:

Travel the length of the Eastern Branch by small boat – which is the only way to navigate the upper reaches - and you will discover its dichotomy. Passing beneath the busy Berkley Bridge on Interstate 264, you enter the mouth of this branch from downtown Norfolk, passing by the popular Harbor Park ball stadium, towering shipyards and industrial tank farms. The further east you paddle, though, you will find this branch narrowing into some of the Elizabeth’s most pristine wetlands, lined with many



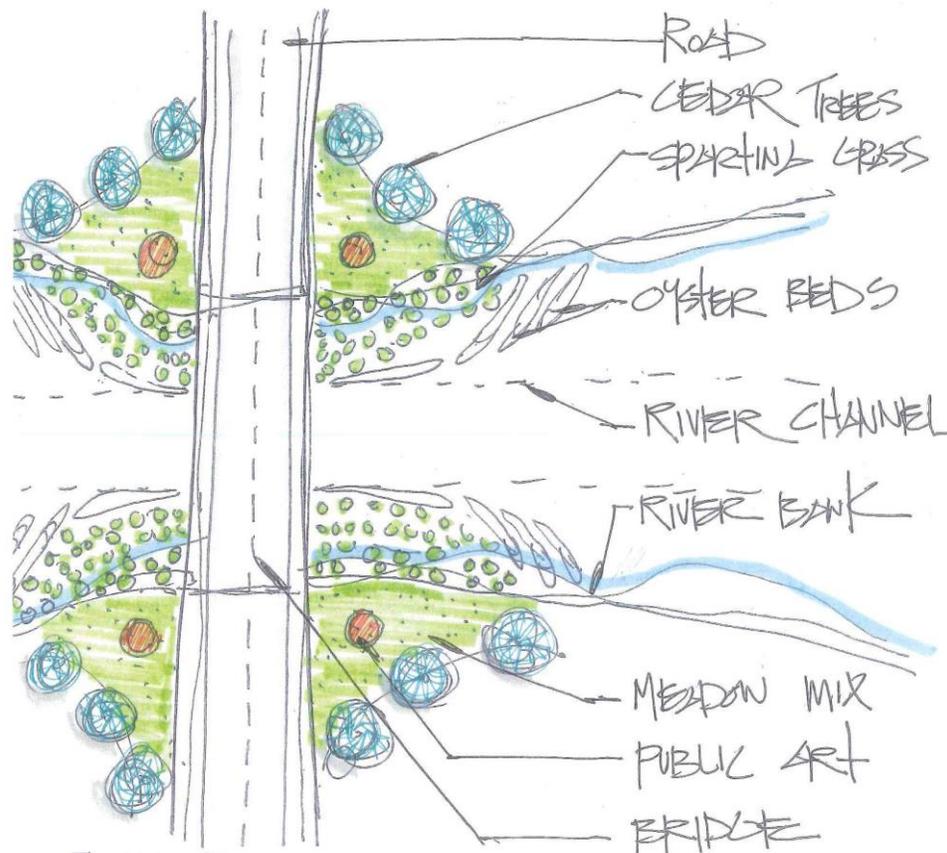
The Eastern Branch presents a dichotomy. Top, Carolanne Farm Park in Virginia Beach exhibits the pastoral wetlands of the upper reaches. Above, Colonna's Shipyard typifies the mouth.

diverse neighborhoods. Meanwhile, the inland landscape that drains to this branch when it rains (“watershed”) includes the sprawling pavements of Military Circle and Janaf. In Norfolk, in fact, more than 50 % of the city’s 17 miles of Eastern Branch shoreline is “hardened” versus natural, while Virginia Beach’s 23 miles of shore on this branch is only 23% hardened.

Trees are super-heroes in absorbing runoff pollution, but a map of tree cover or “canopy” in the Eastern Branch watershed shows large areas with little or no tree canopy, especially in Norfolk near the mouth and downtown. All area Cities have goals to increase tree canopy in the Eastern Branch.

NOAA, meanwhile, as part of this planning effort in 2014 completed a sonar study to identify best places for oyster restoration, while Chesapeake Bay Foundation and Elizabeth River Project conducted a visual survey of likely locations and extent of oysters already in evidence (limited).

GOAL 1: RESTORE TIDAL WETLANDS, WITH PREFERENCE FOR SITES WITH MULTIPLE RESTORATION AND OUTREACH OPPORTUNITIES, INCLUDING BRIDGE APPROACHES.



Multi-media restoration at a bridge approach; artist's rendering by Russell Carlock, NRHA, for Wildlife Habitat Work Group.

BY 2018:

1. **Restore three acres of wetlands (tidal and non-tidal)**, with preference for sites offering multiple restoration and outreach opportunities. Initial sites should be in each of the three cities. Tentative recommendations: Virginia Beach is planning .5 acres of wetlands in Kempsville; Norfolk – consider the Harbor Park shore for a living shoreline as part of revitalizing this waterfront; Chesapeake – Indian River Bridge and include kayak/canoe ramp. Include an approach to remove the invasive reed, *phragmites*.
2. **Implement multi-pronged, high profile restorations at one or more bridge approaches.** See concept drawing developed by Rusty Carlock, an architect with NRHA, incorporating wetlands, cedar trees, oyster beds, meadows and public art. These projects would help combat the invisibility of the Eastern Branch. An initial site to consider: Virginia Beach Boulevard bridge alongside the office of the VA National Guard. Evaluate sites to ensure that sea level rise is taken into account. Identify groups such as master gardeners who will commit to maintain habitats before planting.
3. **Explore these potential funding sources:** Norfolk and Virginia Beach wetlands board penalty fines; Nature Conservancy’s mitigation fund; Coastal Zone grant funds from VA Department of Environmental Quality; corporate sponsors; sea level rise funding; mitigation for road projects. For public art at bridge approaches – 1 % of all capital projects in Norfolk goes into a public art fund.

Potential partners: There may be a need to form a new group to take the lead following the example of Lafayette Wetlands Partnership in Norfolk. Friends of Indian River stands ready to help Elizabeth River Project and municipalities

BY 2024:

1. Restore a total of 10 acres of wetlands (including *phragmites* removal).
2. Consider expanding the Virginia Beach water trail to throughout Eastern Branch (potential National Park Service funding)

GOAL 2: RESTORE 3 MILES OF VEGETATED SHORELINE BY 2024.

1. **Consider a special program, “shore savers,”** to encourage River Star Homes, River Star Schools and River Star Businesses to help meet this goal by planting or conserving their shorelines, taking advantage of funding and assistance available through Elizabeth River Project for these programs. (ERP Executive Director’s note – this was not included in the original ranking).
2. **Market conservation easements** as a way to protect natural shorelines in perpetuity (Living River Restoration Trust, sister organization to Elizabeth River Project, can hold them). Note, NRHA is about to finalize a conservation easement at Grandy Village which could serve as a model.
3. **Map the progress and report it each year.**



Oysters were once so plentiful in the Eastern Branch that they were used to make Shell Road, now Indian River Road.

GOAL 3: RESTORE 10 ACRES OF NATIVE OYSTERS BY 2024. GROW 10 MILLION OYSTERS TO PLACE ON THE REEF (1 MILLION A YEAR FOR 10 YEARS).

BY 2014/15:

1. **Complete 1-acre oyster reef the first year** – Elizabeth River Project using in-hand grant funding from National Fish & Wildlife Foundation, location near Grandy Village.

BY 2016-2024:

1. **Finalize a technical plan** identifying where the best locations are for restoration work, using Chesapeake Bay Foundation and NOAA's new data/studies on Eastern Branch oyster habitat.
2. **Consider under-wharf oyster reef** at Harbor Park as was done on Haven Creek
3. **Look for sites with multiple restoration opportunities.**
4. Enlist oyster gardeners through Chesapeake Bay Foundation and River Star programs.
5. Potential funding: Virginia Beach Oyster Fund (mostly now spent on Lynnhaven), coastline resilience funding, National Fish & Wildlife Foundation (NFWF).

GOAL 4: PLANT NATIVE TREES!

BY 2015/16:

1. **Plant 1,000 trees in Year One at three high visibility sites**, one in each of the three Eastern Branch cities. Potential sites could include: Chesterfield Heights waterfront between Majestic and Westminster (Norfolk); Indian River High and Middle Schools (Chesapeake); Intersection of Witchduck and Newtown roads (Virginia Beach). Plant a Paul Boatwright Memorial Grove. Species – Focus on a featured species for each city;

tentatively Eastern Red Cedar, Live Oak, Bald Cypress. Ensure the trees will be maintained, ideally by a citizen group, before planting.

2016 - 2024:

2. **Plant 500 trees per year** from 2016 to 2024, with a preference for sites where water quality and education also can be achieved.
3. **Promote trees in parking lots**, using a study showing shopping centers with trees make more money. The Target store at Hilltop is a great case study - show pictures.
4. **Pursue these potential funders and partners:** VA urban forestry grant, legacy groves program of Norfolk, tree mitigation bank of City of Norfolk, garden clubs, VA Native Plant Society, Stihl in VB, EVMS/Healthy Norfolk, Hampton Roads Urban Forest Council.

GOAL 5: TRACK PROGRESS WITH MAPS AND FISH SURVEYS TO KEEP THE PUBLIC INSPIRED.

1. Complete and publicize annual **fish surveys**, as well as **maps of shoreline restoration/conservation** achieved, as a great way to keep the public interested in the returning wildlife. Fish surveys have been used this way successfully by area scientists at other Elizabeth River focus areas (Lafayette, Money Point). Partners: NOAA, Elizabeth River Project, CBF, VIMS.



Tommy Leggett and Jackie Shannon of Chesapeake Bay Foundation survey the branch for this plan to identify restoration sites. NOAA also completed a sonar survey of oyster restoration opportunities.

ACTION 3 – RESTORE CLEAN WATER

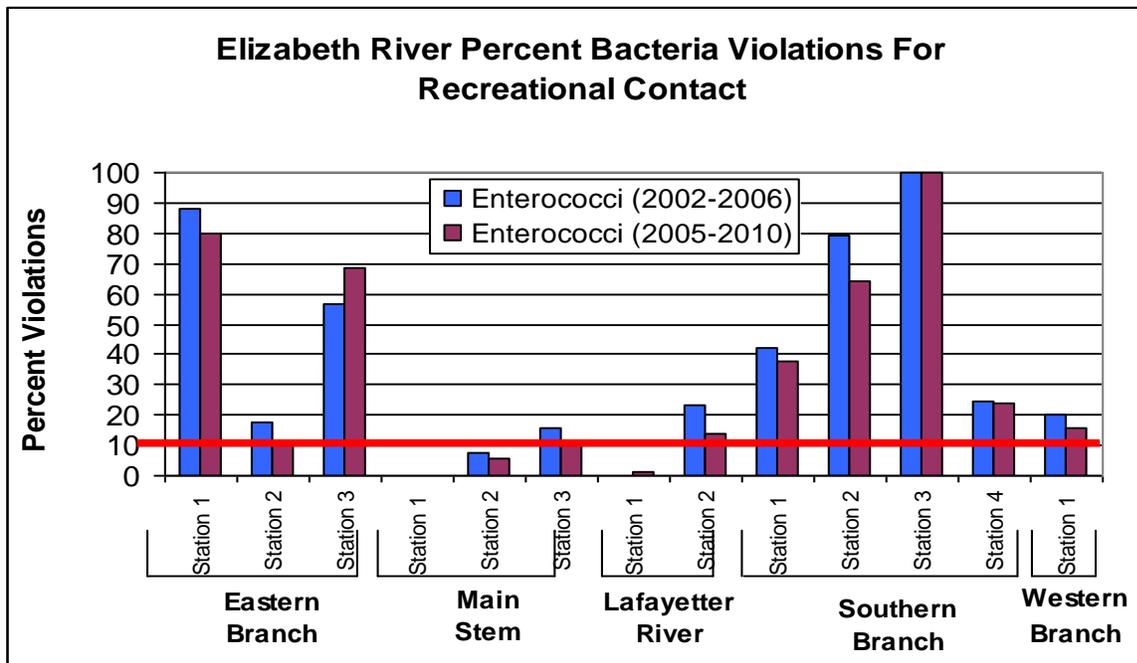
CHALLENGES:

Broad Creek exhibits some of the poorest water quality in the Elizabeth River and leads water quality problems on the Eastern Branch. Broad Creek, in fact, had 66% violations of state standards for dissolved oxygen last year and exceeded state standards for bacteria 65% of the time. Indian River, another large tributary to the Eastern Branch, also exhibits high rates of excess bacteria, according to monitoring by the VA Department of Environmental Quality.

The river becomes cleaner toward the mouth of the Eastern Branch, where flushing is greater, with two monitoring stations near the mouth meeting state bacteria standards for recreational contact in 2011 and 2012 (no stations in the Eastern Branch met state standards in 2013, a year of heavy rainfall and related runoff pollution). Most of the Eastern Branch except Broad Creek meets state standards for Dissolved Oxygen most of the time, with the exception of late August when an algal bloom typically grows in the Elizabeth River.

During wet weather, PCBs in the Eastern Branch exceeded state standards throughout 2009/2010 sampling and were especially high at monitoring stations along Berkley and Military Highway. According to separate monitoring, dissolved metals, meanwhile, appear to meet state criteria.

Probable causes of the polluted water include poor flushing as the Eastern Branch narrows into smaller tributaries (typical throughout the Chesapeake Bay); stormwater runoff, especially from fertilized lawns and paved areas; a large number of septic systems along the Eastern Branch; aging sewer pipes; and an assembly of 20 to 30 derelict vessels that may be leaking pollutants in a cove near the Campostella Bridge. Other potential causes with contributions unclear include old landfills, vessel discharges and litter.



GOAL 1: REDUCE HARMFUL BACTERIA AND EXCESS NUTRIENTS IN BROAD CREEK, INDIAN RIVER AND THE EASTERN BRANCH HEADWATERS BY REDUCING POLLUTED RUNOFF.

BY 2018:

1. **Identify three of the largest untreated paved areas contributing runoff pollution to Broad Creek, Indian River and the headwaters.** Begin implementing intensive stormwater controls for these paved areas, enlisting sites as River Star Businesses. Among sites to consider: Military Circle with 20+ acres of paving near Broad Creek, built before stormwater controls were required.
 - Use “Total Maximum Daily Load” (TMDL, or a prescribed pollution diet for governments) Action Plan guidance tables and Global Information Systems (GIS) land cover data to establish current loading and overall nutrient reductions required in the watershed.
 - Delineate focus area subwatersheds and identify the largest stormwater outfalls in each (ex: Lake Taylor and Indian River Park outfalls).
 - Pursue potential funding including grant funds such as through the National Fish and Wildlife Foundation, municipality stormwater fees, business cost-sharing. Potential partners: Elizabeth River Project, River Star Businesses, Cities of Chesapeake, Norfolk, Virginia Beach.
2. **Promote ordinance changes** to reduce parking lot and other paving requirements.
3. **Promote existing or planned incentive programs** for voluntary commercial and residential stormwater Best Management Practices (BMPs), including pet waste management (“scooping the poop”) and active discouragement of resident geese populations (urban feeding of geese has resulted in over-populations. Canada geese should migrate but turn into residential populations).
 - Focus River Star Homes, Businesses and Schools recruiting and incentives on reducing polluted stormwater runoff in the targeted areas, with Broad Creek, Indian River and Kempsville neighborhoods to receive priority attention.
 - Consider campaigns to discourage resident geese on commercial sites.
4. **Establish target goals**, by focus watersheds and overall, for acres of “impervious” (paved, rooftops, other hard surfaces that do not let rain soak in) and “pervious” (unpaved or paved with pervious material) areas reduced or treated (ie: street sweeping, nutrient management).

BY 2024:

1. Complete stormwater improvements of large paved areas.

2. Meet target goals for reducing or treating paved areas and increasing other stormwater treatment areas.



The water quality in the Eastern Branch improves toward its mouth, with greater flushing. The plan focuses on achieving cleaner water in the narrow reaches, especially in Broad Creek and Indian River.

GOAL 2: REDUCE BACTERIA AND NUTRIENTS IN DRY WEATHER BY ADDRESSING SEPTIC SYSTEMS AND OTHER SEWAGE CONCERNS.

BY 2018:

1. **Establish a regional task force on septic tanks, with the Eastern Branch as the pilot focus area**, for the purposes of increasing tracking of existing septic tanks, enforcing pump out of the tanks, providing education and considering incentives and possible grant programs for replacing septic tanks with wastewater hookups. In Norfolk alone, 37 septic tanks are identified along the Eastern Branch, with still larger numbers estimated for the other two cities. Partners: VA Department of Health, HRSD, municipalities, Elizabeth River Project, Friends of Indian River.

2. HRSD in conjunction with municipalities: Continue to implement **large-scale wastewater treatment improvements** to addressing aging pipes, in keeping with federal requirements.
3. HRSD and municipalities: Implement programs to more effectively identify and address **illicit discharges**.
 - Review Elizabeth River Project’s 2014 sampling of bacteria in the Eastern Branch to identify potential hotspots that may involve illicit discharges.
 - Consider citizen monitoring in dry weather.
4. **Conduct a survey to determine the number of pleasure boats** on the Eastern Branch that are large enough to have holding tanks for sewage (Elizabeth River Project during bacteria sampling). If warranted by significant numbers of these boats, follow up with education and outreach. HRSD could target relevant neighborhoods with flyers.
5. **Promote HRGreen’s FOG (“Fats, Oils and Grease”) education program** to encourage residents not to dump these materials down the drain, where they cause more than half of all sewage blockages in Hampton Roads (also one of the River Star Homes 7 steps).
 - Consider if there is a way to promote re-use of cooking oil in vehicles.

By 2024:

1. Meet state standards for bacteria and Dissolved Oxygen in dry weather throughout the Eastern Branch to the maximum extent practical.

HRGreen: How to keep cooking fats, oils and grease at bay

FOG. You probably think of this as a weather term, but FOG (fats, oils and grease) takes on a whole new meaning when it comes to what lies beneath our streets, lurks under manholes and clings to the insides of pipes that connect right to your very own kitchen sink. Sound like a horror film? It is scary when you consider that FOG contributes to more than half of all sanitary sewer blockages in Hampton Roads.

Poured or washed down the drain into the sanitary sewer system, FOG clings to pipe walls and builds up over time, blocking the flow of wastewater exiting a home’s plumbing. This can lead to an overflow or backup of wastewater into our homes or onto our streets and down storm drains which lead straight to local waterways.

You might be surprised that the source of all this greasy buildup in our pipes is not just cooking oils or grease. You’ll find it daily in your kitchen in the form of meats, butter, food scraps, dairy products, batters, dressings, sauces, and more. So, how do we fight the fat to protect pipes and prevent costly blockages and backups?

- 1) Skip the garbage disposal and always be mindful of what you wash down the drain.
- 2) Use a basket strainer to catch food particles and toss them in the trash or compost bin.
- 3) Scrape plates and wipe cookware with a paper towel prior to washing.
- 4) Never pour used cooking grease down the drain. Instead, pour it into an empty, heat-safe container, like a soup can, let it cool and harden, then toss it out with the garbage.



GOAL 3: IDENTIFY AND ADDRESS ANY LEGACY SOURCES OF PCB CONTAMINATION

BY 2018:

1. **Identify potential legacy sources of PCB contamination** in the Eastern Branch.
 - Review 1988 EPA report of dump sites. Review any state or federal spill records. Research other records which may provide information. (Work group convened by Elizabeth River Project)

BY 2024:

1. If legacy PCB sources are identified, work with all relevant partners to develop an appropriate plan identifying who and how the sources might be addressed, if feasible – recognizing that addressing legacy PCBs is challenging and not always feasible.

ACTION 4 – CLEAN THE RIVER BOTTOM

CHALLENGE:

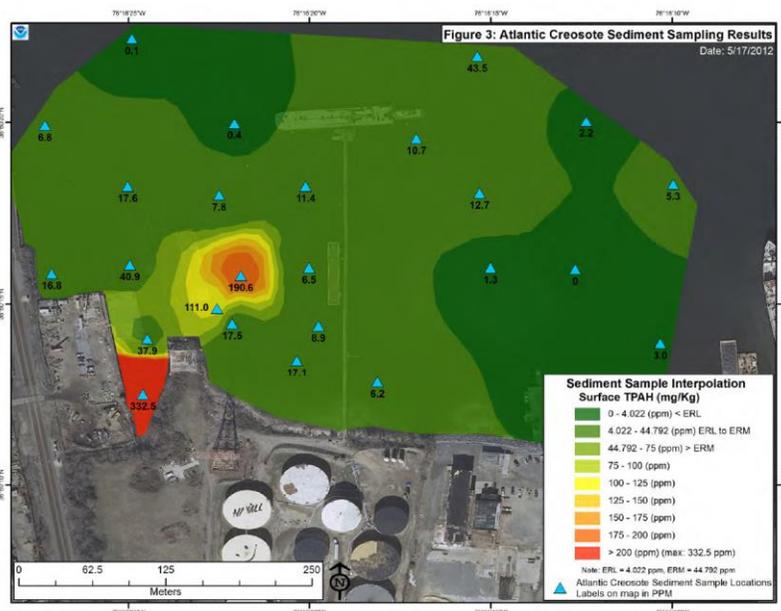
The bottom of the river serves as the foundation of the food chain. Without a healthy river bottom, or “benthos,” teeming with shellfish, worms, bottom-dwelling fish and microscopic life, the rest of the river cannot recover.

Contamination can hamper life on the river bottom. A spectacular 1907 fire and other practices have created a significant area of contamination in the Eastern Branch, off-shore of a former creosote plant. Encouragingly, this site, former Atlantic Creosoting and Wood Preserving, is being addressed by a new purchaser, Kinder Morgan, which has entered the site in Virginia’s Voluntary Remediation Program. Elsewhere on the Eastern Branch, old creosote pilings in the vicinity of Harbor Park may need removal for a healthier river bottom life. Other areas need further investigation due to Old Dominion University studies showing low levels of bottom-dwelling marine life.

GOAL 1: ADDRESS CONTAMINATED SEDIMENTS FROM THE MOUTH AT THE BERKLEY BRIDGE TO BROAD CREEK.

In the early 20th century, Atlantic Creosoting and Wood Preserving company operated just east of the Norfolk Southern railroad tracks. The company treated wood with creosote, which contains polycyclic aromatic hydrocarbons (PAH), now associated with elevated cancer in the indicator fish, the mummichog, in hotspots of the Elizabeth River.

The Washington Post reported, Jan. 20, 1907: *“The most spectacular fire in the history of the city occurred today, when a spark from a locomotive of the Norfolk and Western Railway set fire to grass near the plant of the Atlantic Creosoting Company, and fanned by a forty-mile wind, the flames extended to the great lumber piles and oil tanks of the company...”* About 75,000 gallons of creosote exploded in tanks, while 2,500 barrels



burned along with several hundred thousand creosoted piles. A 600-ft pier with hundreds of barrels of oil was destroyed. A second fire in 1917 almost destroyed the plant and released more creosote.

The Virginia Department of Environmental Quality for a number of years contracted with the Virginia Institute of Marine Science to investigate mummichog liver cancer throughout the river. Sediments near this site consistently showed high rates of cancer. The Elizabeth River Project followed up with surface sediment sampling here in 2012 and found two hotspots ranging from 119 parts per million to 335 parts per million of total PAH.

In 2013, Kinder Morgan bought the site and entered it into the state's Voluntary Remediation Program. Kinder Morgan has indicated its intent to address the creosote related impacts both in the upland portion of the property and in the river, as well as impacts in an adjacent inlet. VA Department of Environmental Quality will oversee remediation efforts. Kinder Morgan has hired a consultant to investigate impacts and develop an appropriate remediation strategy and plans to begin further sampling in 2015.

Meanwhile, hundreds of old pilings are falling into the river in the vicinity of Harbor Park at the mouth of the Eastern Branch, potentially leaching creosote into the river also. And it's not known if additional contaminated sites may exist.

BY 2018:

1. Kinder Morgan, recent purchaser of the site of the former Atlantic Creosoting and Wood Preserving Company, complete a site investigation, feasibility study and design plan for addressing off-shore contamination at this location.
 - Partners also will need to determine if there are any ongoing upland sources of PAH contamination making their way into the river. If upland contaminant sources are identified, they will need to be corrected prior to sediment remediation.
2. Determine the impacts of any leaching which may be occurring from creosote pilings at Harbor Park, also considering their potential habitat value for fish such as striped bass. If appropriate, consider removal of creosote piles from along Harbor Park waterfront.



Kinder Morgan recently purchased this former creosoting site and intends to address contamination issues.

3. Conduct additional sediment sampling and data review to determine if there are other sediment hotspots that need to be addressed in the Eastern Branch, focusing on the area between the mouth and Broad Creek. Elizabeth River Project will review past dredging permits to determine if there are additional sediment sites which need to be investigated. Elizabeth River Project will partner with VA Department of Environmental Quality and/or VA Institute of Marine Science to collect additional sediment data. The sample locations should be based off of existing data which has been collected.

BY 2024:

1. Partners should work with Kinder Morgan to complete the remediation determined to be appropriate for offshore sediments.
2. Reduce total PAH levels in Eastern Branch sediments to levels that are not cancerous to mummichogs.
3. Consider a living shoreline along Harbor Park waterfront.
4. *Explore funding sources:* EPA Brownfields grants, VA Department of Environmental Quality revolving loans. *Partners:* City of Norfolk, VA Department of Environmental Quality, EPA, industrial partners, Elizabeth River Project.
5. If additional contaminated sites are located, ensure they are under active remediation.

GOAL 2: CONDUCT BOTTOM SAMPLING IN UPPER REACHES OF THE EASTERN BRANCH, INCLUDING BROAD CREEK AND INDIAN RIVER.

Studies by Old Dominion University have found an over abundance of pollutant tolerant species and a low number of pollutant sensitive species in bottom-welling marine life in the upper reaches of the Eastern Branch (ODU Biotic Index of Benthic Integrity, Dr. Daniel Dauer). Additional research is needed.

BY 2018:

1. Review data and collect additional data. Determine if contaminants exist at levels detrimental to “benthic” (bottom of the river) health. Partners: VA Department of Environmental Quality, Old Dominion University, and Norfolk State University. The BIBI data should be re-evaluated. A study needs to determine if the BIBI impacts are due to sediment contamination or other factors. This will require collecting additional benthic (BIBI) data along with sediment contamination data.

BY 2024:

1. Develop and implement remediation plans for any contaminated areas identified.



SPECIAL THANKS!

EASTERN BRANCH STEERING COMMITTEE

Convened by Elizabeth River Project

Kim Ambrose, Richard Bowling Elementary

Bill Ballinger, Norfolk State University

Michael Barbachem, Whitman, Requardt &
Associates

Danny Barker, HRSD

Jason Barney, Barney Environmental

Lisa Bass, Resident of Kempsville

Dee Bell, Kinder Morgan/South Hill /
Norfolk Terminals

Clay Bernick, City of Virginia Beach

Robert Berz, Lindenwood/Cottage

Heights/Barraud Park Civic League

Pam Boatwright, Elizabeth River Project

Dennis Borgerding, Kempsville Magnet
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Carolyn Brehon, Vice President Chesterfield
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Carolyn Brown, Chesterfield Heights Civic
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Chesterfield Revitalization Committee

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Lewis White, Parson Brinckerhoff
Jayne Whitney, Friends of Indian River
Elizabeth Williams, Resident of the
Woodvine

JOIN THE COMMUNITY-WIDE EFFORT TO IMPLEMENT THIS PLAN! YOU CAN MAKE THE DIFFERENCE.

People from all walks of life prepared this plan because they care about the least known branch of the Elizabeth River. Join the most exciting phase of the plan: implementation, by citizens, government, schools and businesses.



The Eastern Branch Steering Committee visits Indian River Park, the largest public park on this branch of the Elizabeth River. The committee invites you to be a part of implementing this ambitious plan.

CONTACT US FOR HOW TO HELP

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