

The Lower Christina-Brandywine River Remediation, Restoration, Resilience (CBR4) Plan



Restoring Wilmington's Rivers

The CBR4 Team



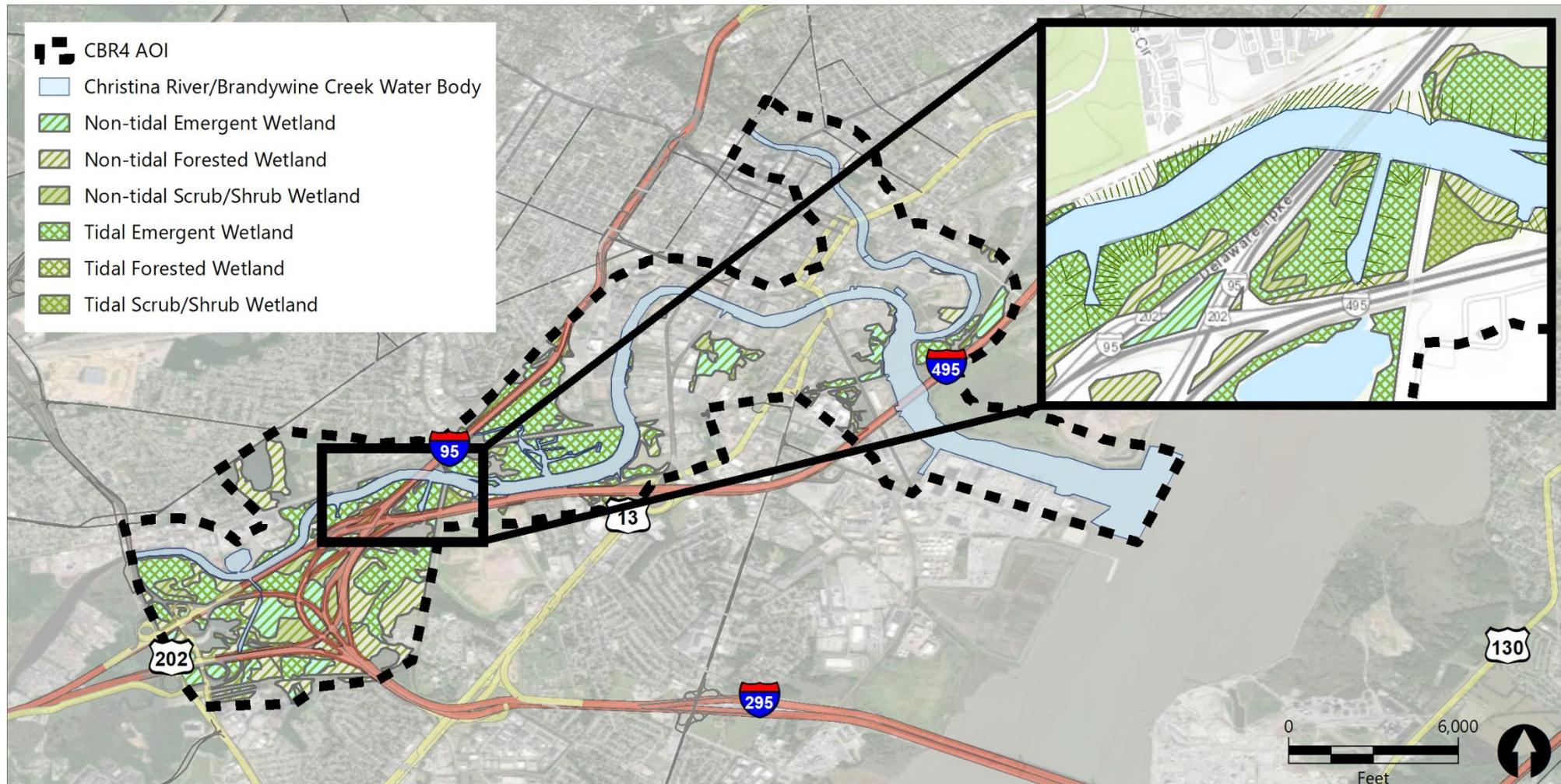
(And More!!!)

CBR4 Planning Timeline



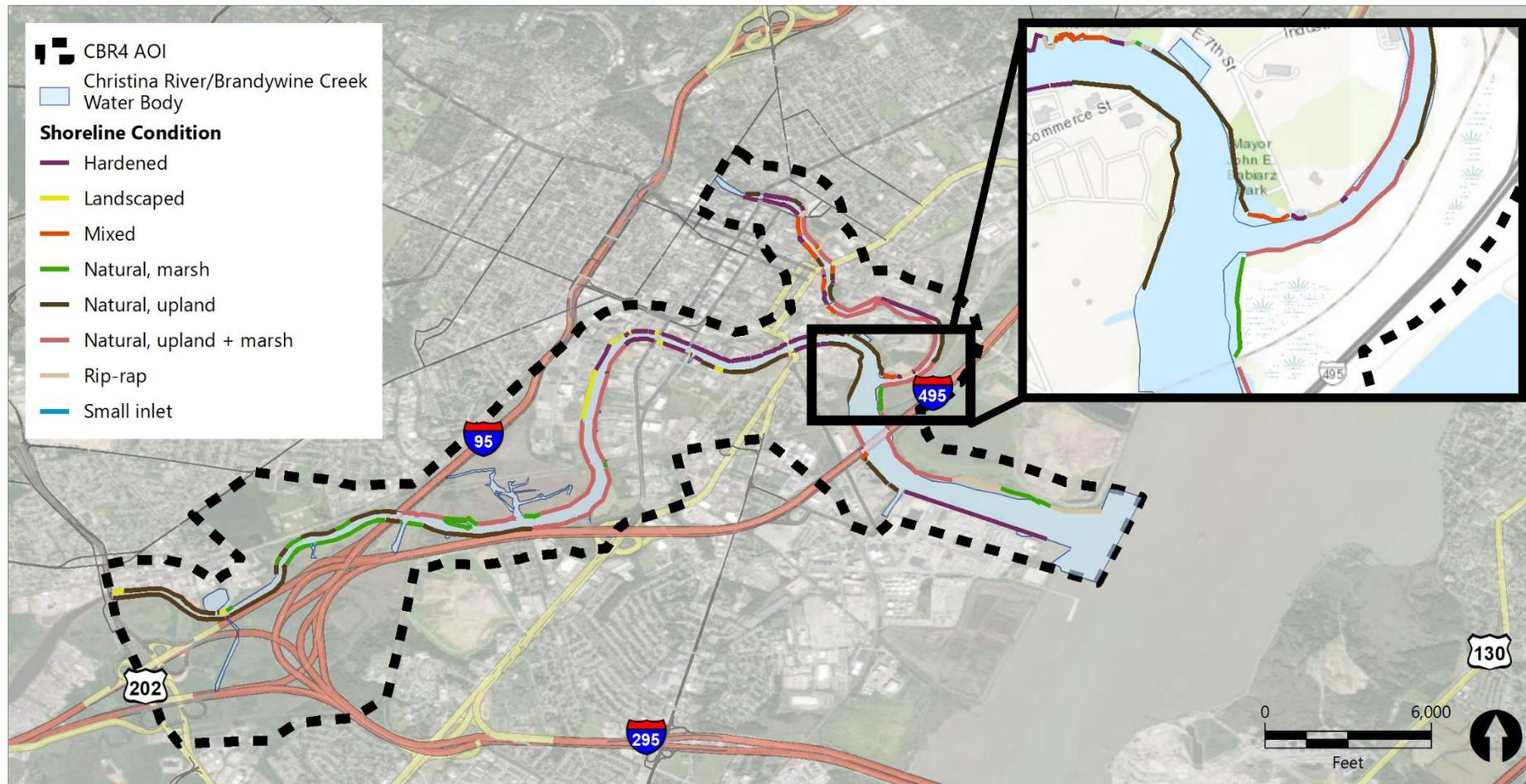
Goal: Restoration & Protection of Wetlands

- No net loss, improved ecological function
- Baseline: 1,000 - 1,800 acres of wetlands in project area



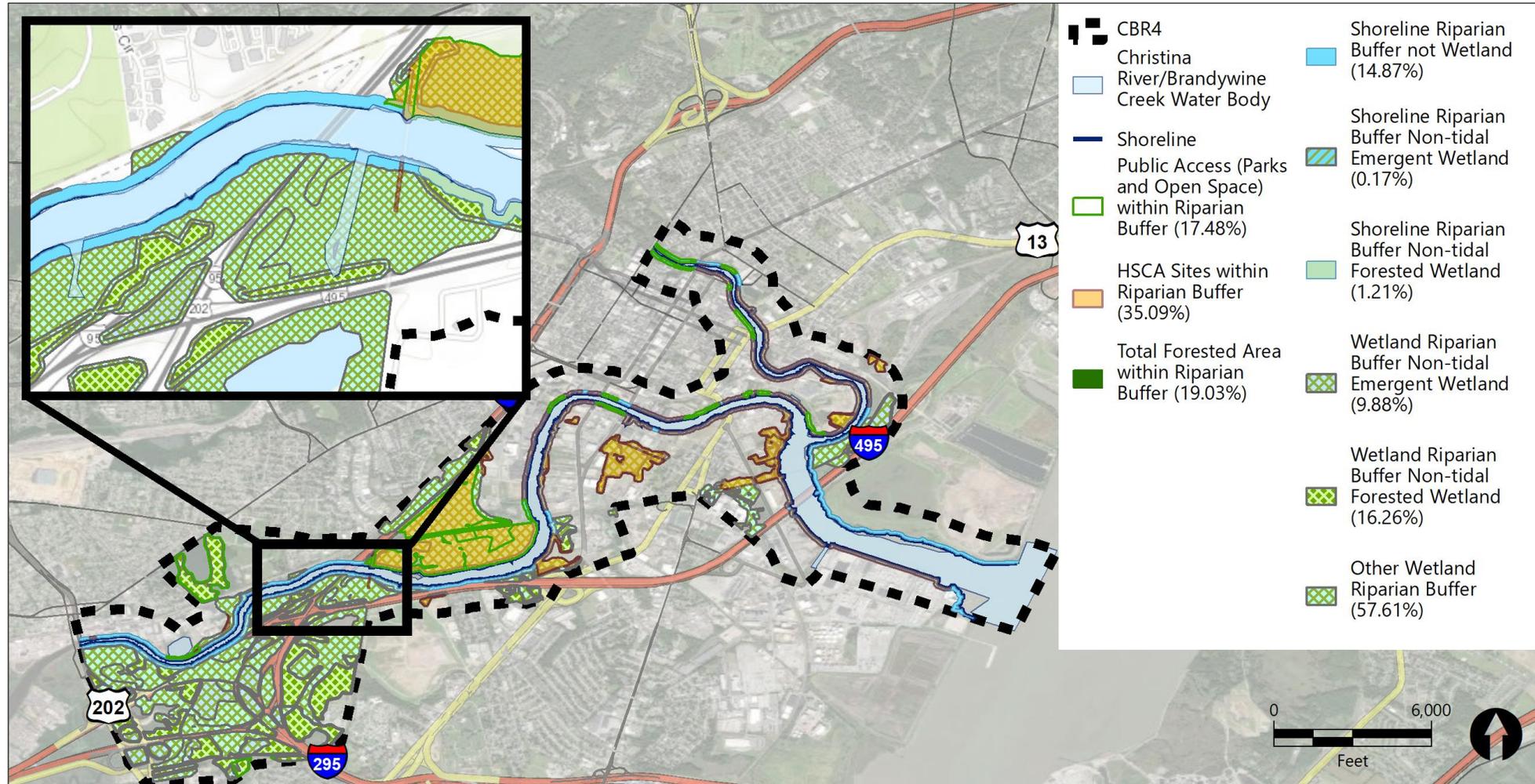
Goal: Restoration & Protection of Shorelines

- Limit loss and improve function
- Baseline: 111,800 linear feet of shoreline, 60% natural, 40% fully or partially hardened



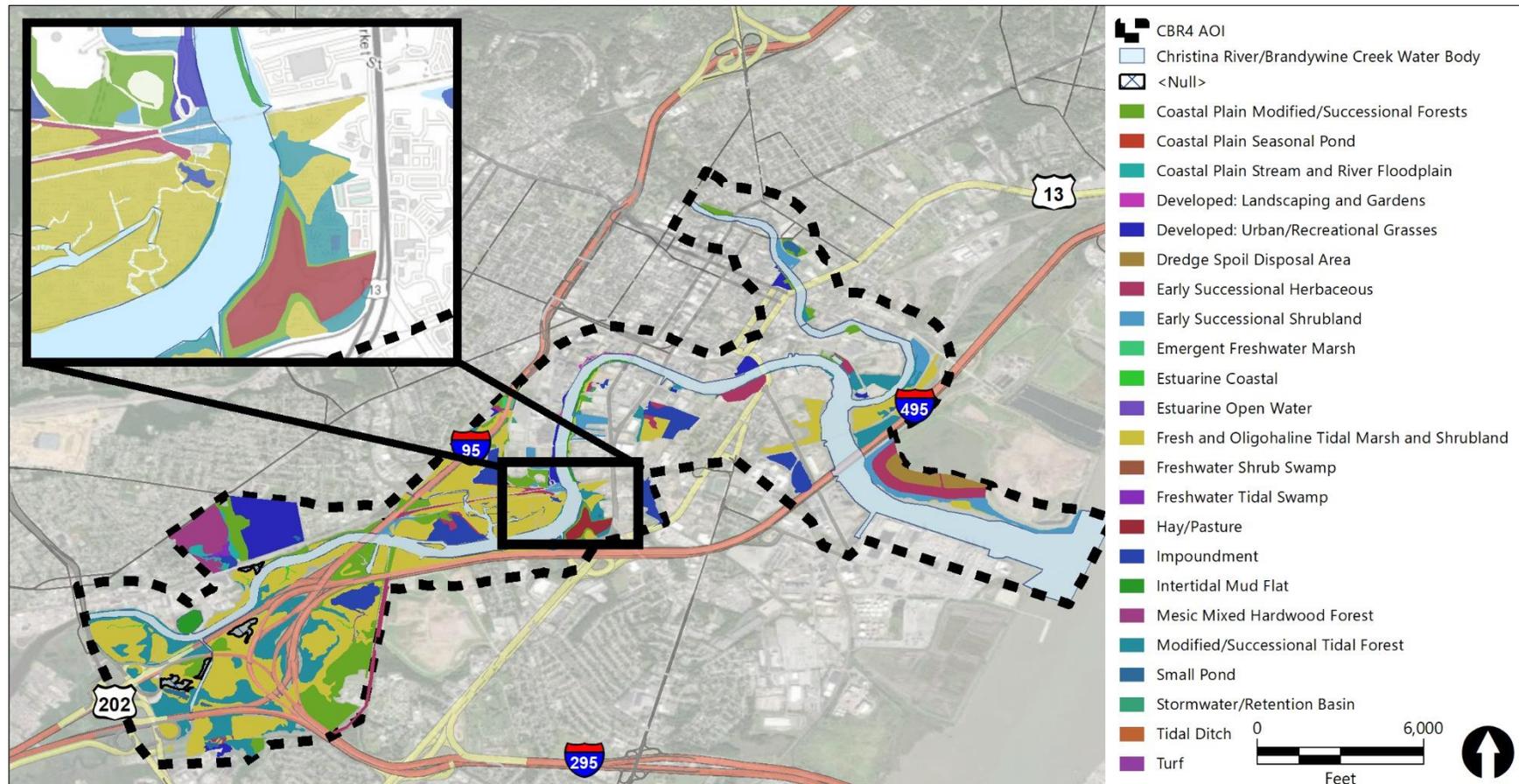
Goal: Restoration & Protection of Riparian Areas

- No net loss of vegetated buffers, improved function
- Baseline: over 1,500 acres within 100-foot buffer, 70% undeveloped



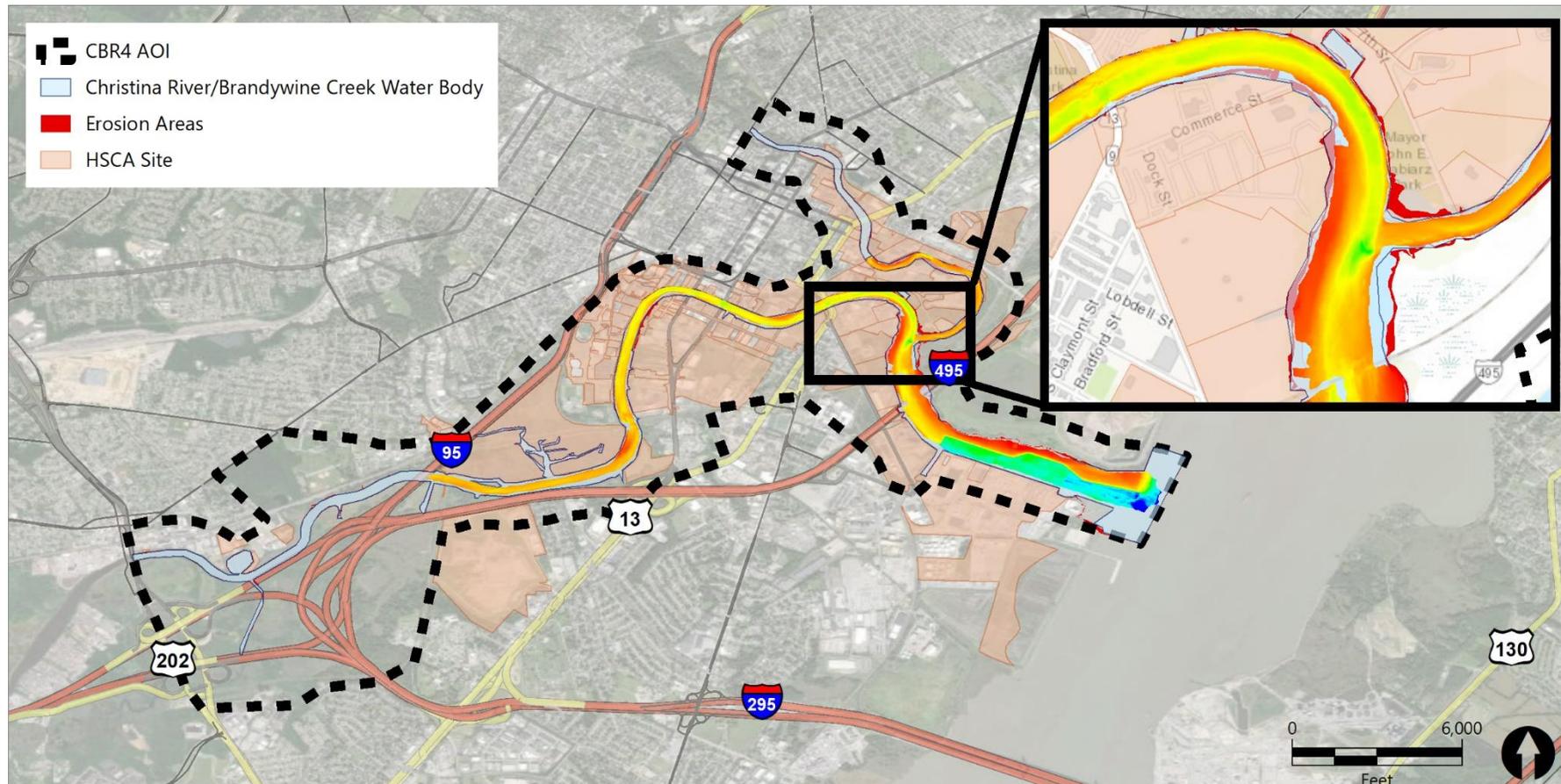
Goal: Restoration & Protection Adjacent Habitats

- No net loss of open space (forested especially) with increased habitat, connectivity, and access
- Baseline: Over 1500 acres in the project area, 20% forested, 35% protected and 17.5% open to the public



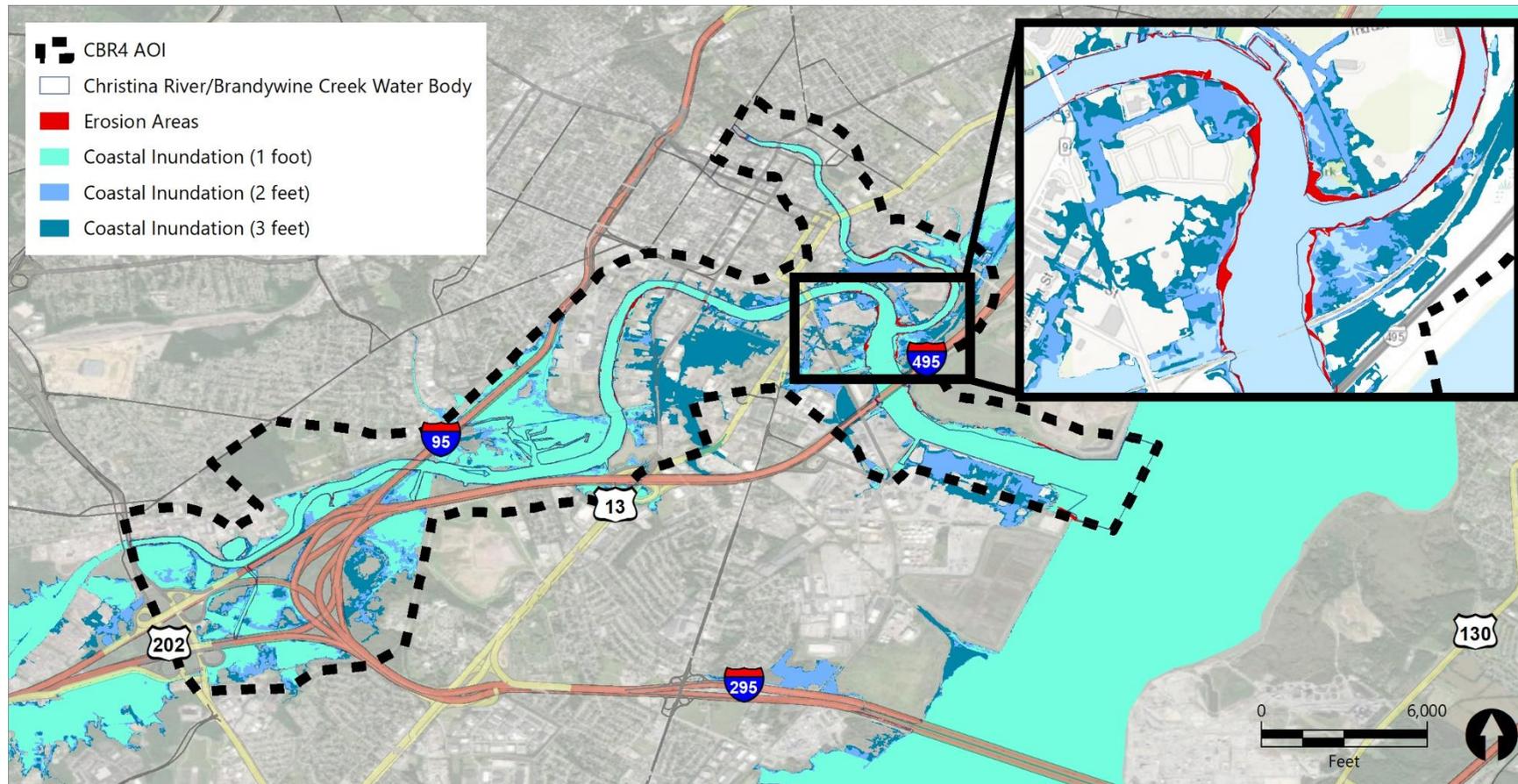
Goal: Remediation of Contaminants

- Complete feasibility study and continue remediating priority sites to reduce loading and contamination of fish over time
- Baseline: Over 530 acres of land and 630 under the water impacted by contamination



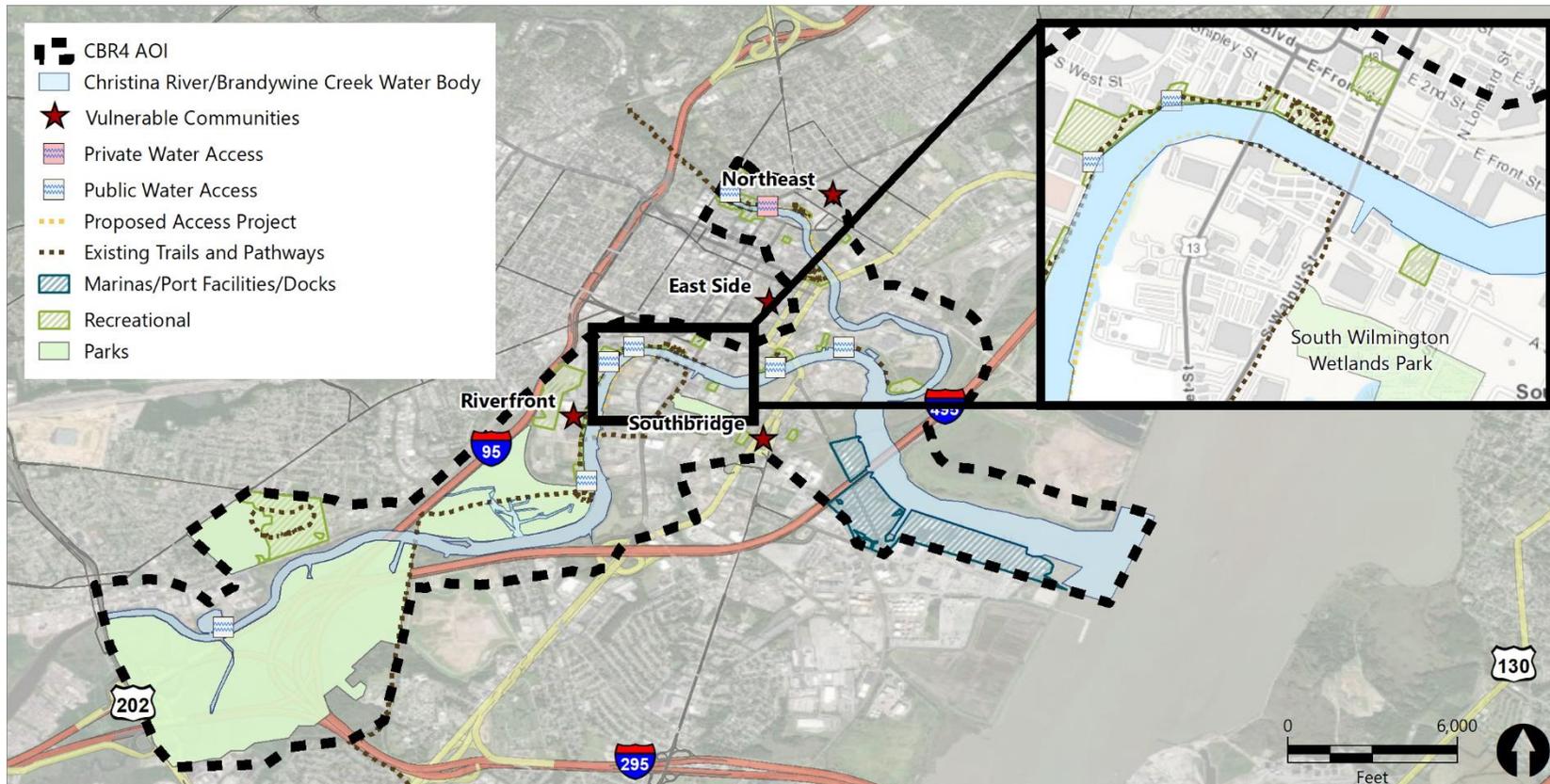
Goal: Increase Community Resilience

- No net loss of low-lying natural areas, increased tree cover, increase and balance green infrastructure with grey
- Baseline: 700 acres of low-lying area nearshore areas that are undeveloped, 7 acres existing tree cover



Goal: Improve Community Access to Rivers

- Maintain and promote the safe use of access areas, add access in key locations to diversify and connect
- Baseline: 1400 linear feet of buffer area publicly accessible; 16 miles of trails, 7 public river access points





Protect and Restore

- Identify and implement projects to **protect and restore wetlands and shorelines.**
- Identify opportunities for restoring key **subaqueous habitats** for fish and shellfish.
- Identify and implement projects to **connect** uplands and riparian areas.
- Identify, **protect and connect small** wetland, natural, greenspace, and undeveloped areas for ecological benefits.

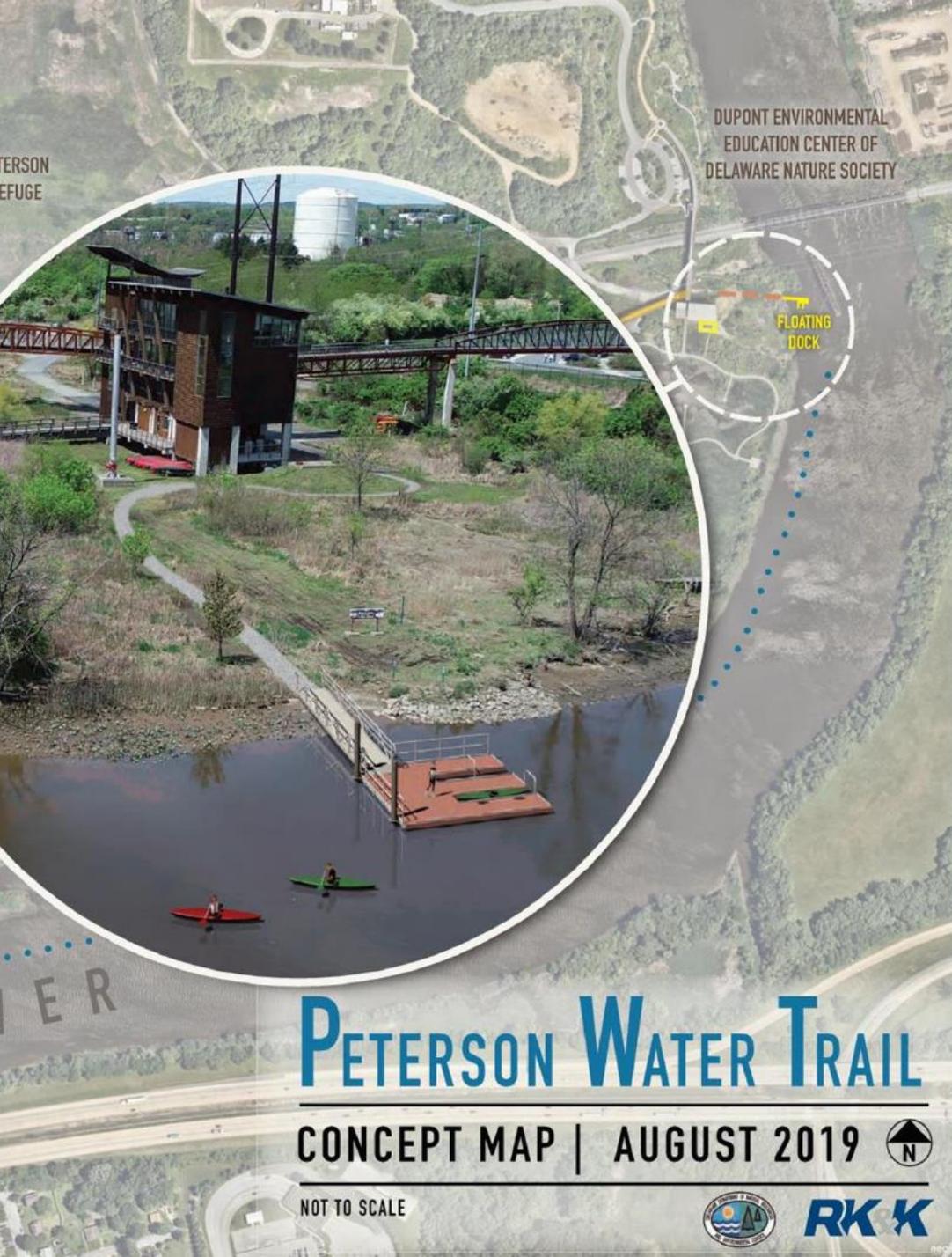
Remediation & Resilience

- Continue the DNREC **fish tissue monitoring** program.
- Complete the sediment remediation feasibility study
- Continue the investigation and **cleanup** of contaminated land as it is redeveloped
- Identify areas where **flood control** can be installed, impervious reduced.
- Develop a tree planting campaign

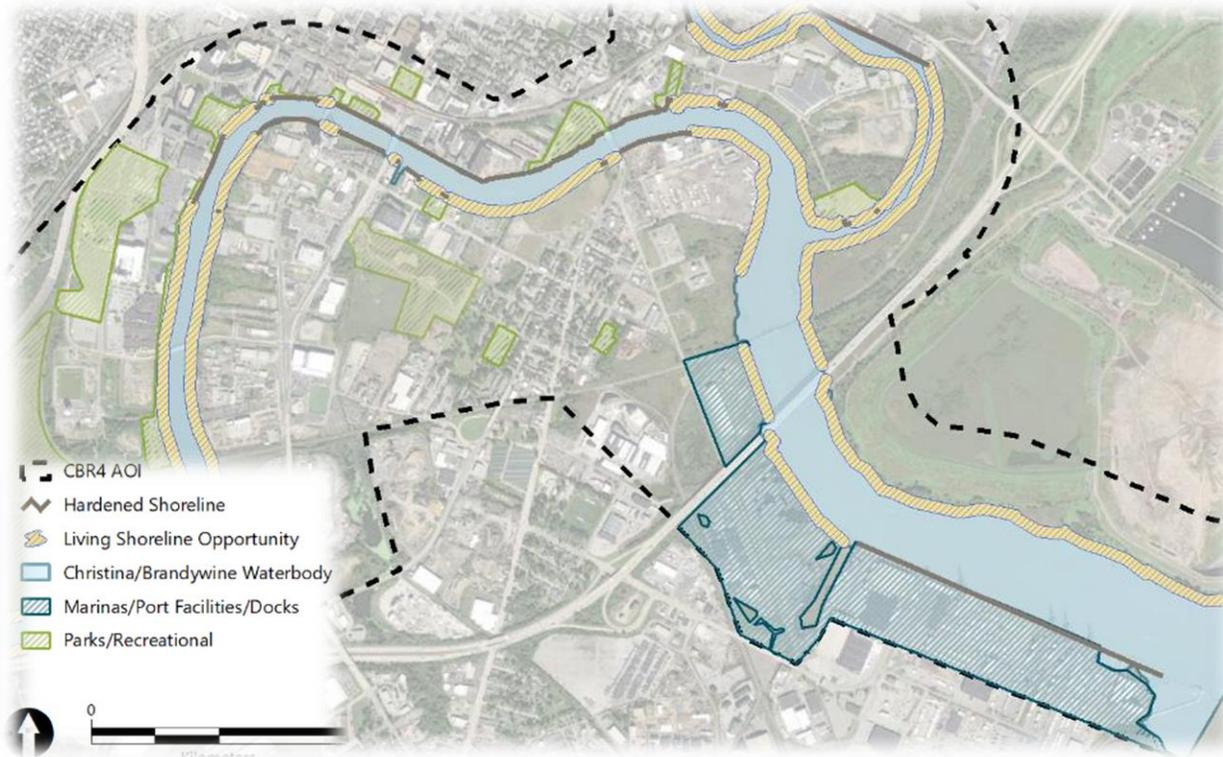


Connect & Engage

- Improve access including **safety** of parks and other public access areas.
- Identify and create **new access**
- Work with local community to implement **projects and policies from local plans.**
- Develop **educational programs and a Community Advisory Council** that engage community members, and groups with experts.
- **Policies** that incentivize green space, update structural requirements for and improve protection from flooding



Opportunity: Living Shorelines



Shorelines where the river meets the land can support a wide array of plants, animals, and fish and act as natural water filters if kept and managed in a natural way.

There are over 20 miles of shoreline along the Christina and Brandywine Rivers in the project area. Where these shorelines have not been hardened with bulkheads or other structures, restoring living shorelines can provide natural habitat and help prevent erosion and flooding. A gradually sloping natural shoreline can also offer opportunities for people to view and interact with these natural areas and the water's edge.

Which CBR4 goals does this opportunity meet?

- | | | |
|--|---|--|
| <input checked="" type="checkbox"/> Restoration and Protection of Wetlands | <input checked="" type="checkbox"/> Restoration and Protection of Shorelines | <input checked="" type="checkbox"/> Increase Community Resilience |
| <input checked="" type="checkbox"/> Restoration and Protection of Riparian Areas | <input checked="" type="checkbox"/> Remediation of Contaminants | <input checked="" type="checkbox"/> Improve Community Access to Rivers |
| | <input checked="" type="checkbox"/> Restoration and Protection of Adjacent Habitats | |

Project Examples: Living Shorelines

Along the Christina



Concepts for Riverfront East development on the Christina River include natural shorelines with public access, but these have yet to be designed. CBR4 scientists are working with the Riverfront Development Corporation's contractors to identify the best possible living shoreline projects for these areas.

Signature Species



Spatterdock is a member of the water lily family. Submerged portions provide habitat for many invertebrates, which are used as food by many other fish and wildlife species.

7th Street Peninsula



Scientists have assessed the areas around Babiarz Park and found two areas for potential living shorelines to bolster protection and increase natural habitat and species – including mussels that help restore water quality.

Signature Species



Eastern Elliptio is a freshwater mussel. It filters and improves water quality and serves as food for other species like fish, raccoons, otters, and birds.

Along the Brandywine



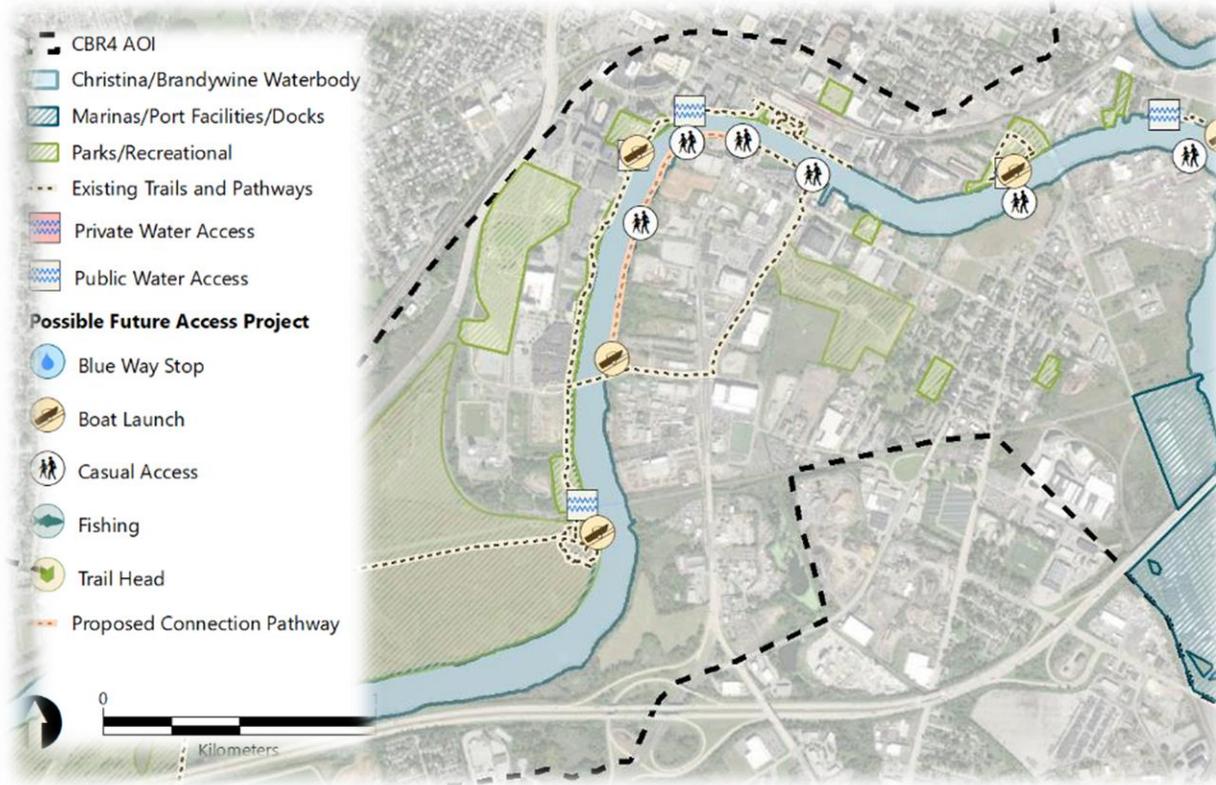
An ambitious living shoreline concept plan with public access was proposed for the Brandywine River between Market Street and Northeast Boulevard. Assessment and cleanup of brownfields is currently underway at the location and must be completed before this can proceed. In the meantime, ways to improve shoreline habitat, resilience, and public access (connecting to Brandywine Park) are being explored.

Signature Species



The **Pickerel Frog** has been found along the Brandywine and may be a good indicator of water quality. It requires vegetated shorelines for summer habitat.

Opportunity: Community Access



Rivers and public recreational spaces are shared resources. Everyone should have access to them. In the CBR4 study area, there are about 3.5 miles of publicly accessible areas along the rivers, 16 miles of trails, and at least seven places for people to get to the water. It's a good start, but with so much shoreline (20 miles) we could do even better.

This map shows existing access points and places for new ones in the future.

Which CBR4 goals does this opportunity meet?

- | | | |
|--|---|--|
| <input checked="" type="checkbox"/> Restoration and Protection of Wetlands | <input checked="" type="checkbox"/> Restoration and Protection of Shorelines | <input checked="" type="checkbox"/> Increase Community Resilience |
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Project Examples: Community Access

Peterson Marsh Water Trail



The Russell W. Peterson Urban Wildlife Refuge is home to over 200 acres of freshwater tidal marsh. There are existing opportunities for paddling but this project aims to create a permanent navigable water trail.

Signature Species



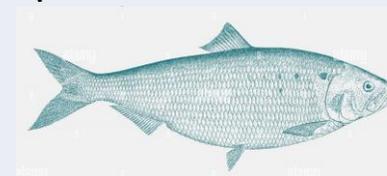
River Bulrush can be found in freshwater marshes and forms part of a globally rare and unique plant community. It provides food, cover, and nesting sites for waterfowl and other birds.

Brandywine Dam One



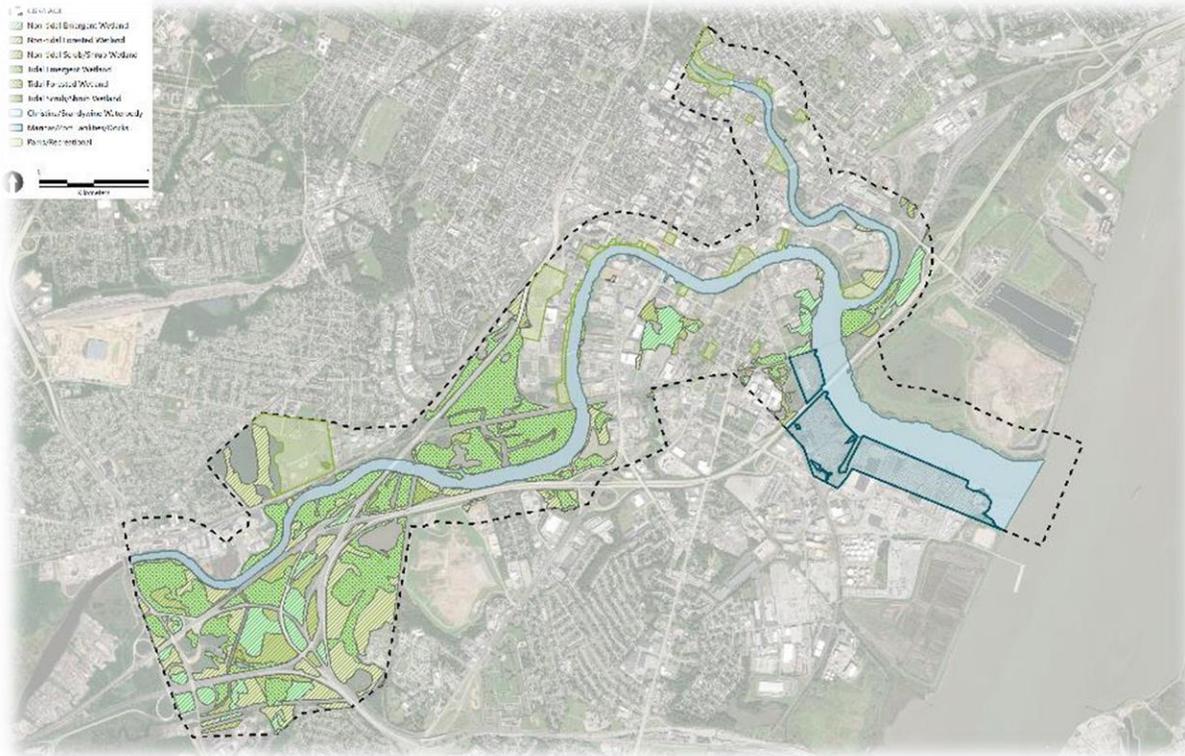
This area along the Brandywine is already on locals' radars as place to picnic but what if it could be even more accessible and have higher quality habitat? There are preliminary plans to add an ADA accessible ramp at the site and there are opportunities to plant trees, add a viewing platform, and establish regular maintenance.

Signature Species



American Shad is a type of fish that lives in the ocean but travels upriver to spawn. Shad is an important part of the food web and feed on insects and zooplankton when young and provides food for larger fish, birds, and mammals as adults.

Opportunity: Wetland Creation and Uplift



Wetlands are important for many reasons—they provide habitat and food sources for fish and wildlife; act as incubators for baby fish; filter and clean water; and act like a sponge to absorb heavy rainfall and help prevent flooding.

There are over 1,000 acres of wetlands in the project area. It's important to protect the wetlands we have, make them healthier, and where possible, create more. The project area has some unique opportunities for creating wetlands.

Which CBR4 goals does this opportunity meet?



Restoration and Protection of Wetlands



Restoration and Protection of Shorelines



Increase Community Resilience



Restoration and Protection of Riparian Areas



Remediation of Contaminants



Improve Community Access to Rivers



Restoration and Protection of Adjacent Habitats

Project Examples: Wetland Creation and Uplift

Former Marina



An old marina along the Christina might be the perfect spot to restore and create new wetland habitat. The current subtidal habitat is soupy and degraded, but the addition of new sediment would increase stability and provide the proper elevations for wetland plants to grow. If this project were pursued, wetland creation could be paired with recreational and education opportunities for visitors.

Signature Species
Northern Red-Bellied
Co



The **Northern Red-Bellied Cooter** is a large turtle with a bright red belly found in freshwater coastal habitats of the Mid-Atlantic.

Unused Recreational Site



Another site once meant for recreation could be a great opportunity for restoring and creating new freshwater tidal marsh. Although there are existing pockets of plant life here, sediment could be used to create more complex habitat that would support greater plant and animal diversity. This work could be paired with creating new access for the public and new educational opportunities.

Signature Species
Wild rice



Wild rice a plant that provides food and shelter for birds and mammals and habitat for invertebrates. Wild rice also improves water quality.

Opportunity: Green Infrastructure Network



In addition to parks around the City, like Banning Park, there are a variety of other green spaces. These spaces are as large as a few acres or as small as a parking space. Any green, unpaved space can help prevent stormwater runoff by letting water slowly seep into the ground. Additionally, even small green spaces that are close together can be important habitat for birds and insects.

Which CBR4 goals does this opportunity meet?



Restoration and Protection of Wetlands



Restoration and Protection of Shorelines



Increase Community Resilience



Restoration and Protection of Riparian Areas



Remediation of Contaminants



Improve Community Access to Rivers



Restoration and Protection of Adjacent Habitats

Opportunity: Green Infrastructure Network

Banning Park



A project in this underutilized area of the park offers an opportunity to improve the function and water filtering capacity of the existing drainage basin, while also increasing the habitat value of the pond by maximizing the buffer, removing invasives, improving water quality conditions, and creating an educational meadow.

Signature Species



The **Rusty blackbird** lives in wooded swamps and feeds on insects and plant matter. It is one of North America's most rapidly declining species.

Constitution Yards



This project will demonstrate strategies for protecting and connecting small wetland, natural, greenspace, and undeveloped areas with common management plans for ecological benefits. As a pilot, it will not only restore habitat and better manage stormwater in this highly visible public access area, but also provide guidance, training, expert and community input to the Riverfront Development Corporation for similar projects in other areas of the riverfront.

Signature Species



The **American Bumblebee** is an important pollinator that has declined dramatically and now needs diverse, pesticide-free wildflower habitats to recover.

Southbridge Wilmington Wetlands Park



Officially opened in 2022, the Southbridge Wetlands Park provides 17 acres of restored freshwater tidal wetland with public access connecting Southbridge, the Riverfront and downtown. The next phase of work includes restoration of an adjoining parcel recently purchased by the City of Wilmington, separation of the combine storm sewer system, improved access to the Wetlands Park from Southbridge, and exploration of potential sites/designs for an eventual second wetland park to the east.

Signature Species



The **American Kestrel** is a declining grassland falcon that is listed as Endangered in Delaware.

CBR4 Planning Timeline



Seeking Stakeholder Input on Projects



- Nov 29th and 30th Community Open Houses
- January 26, 2023 Key Stakeholder Workshop
- Early 2023:
 - Final Products to NFWF
 - Pilot Project with RDC Begins!

