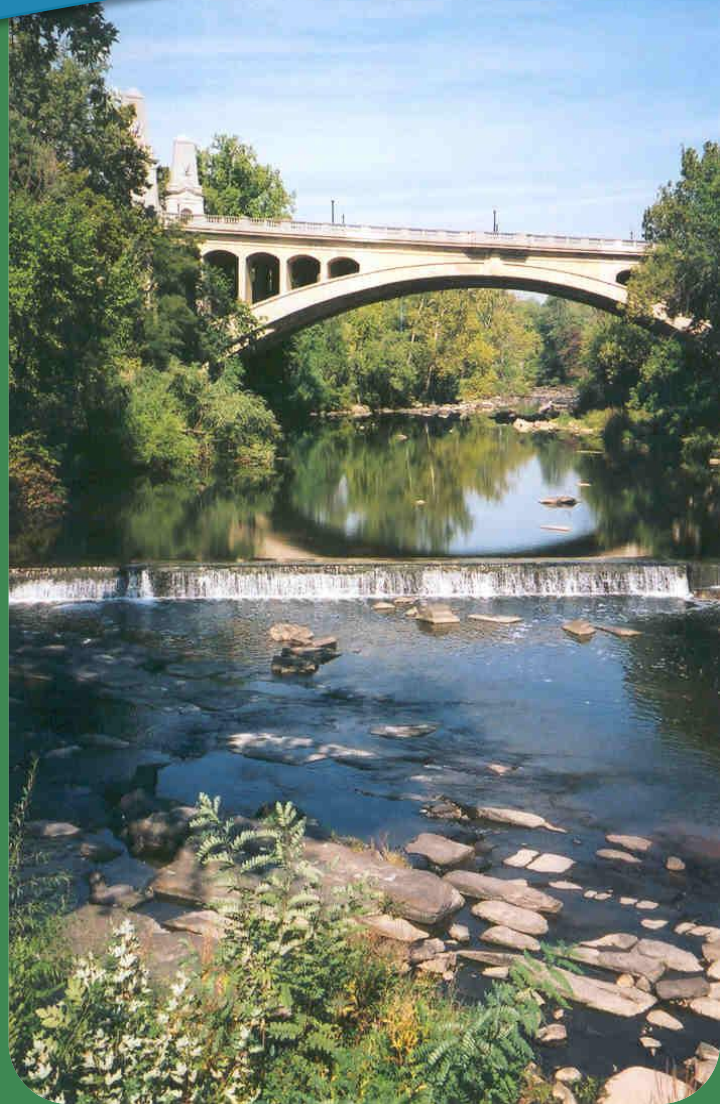


# Strategic Plan

2022 – 2026



Partnership for the  
**DELAWARE  
ESTUARY**



Five Year Strategic Plan  
Approved on Feb. 24<sup>th</sup>, 2022  
[www.delawareestuary.org](http://www.delawareestuary.org)

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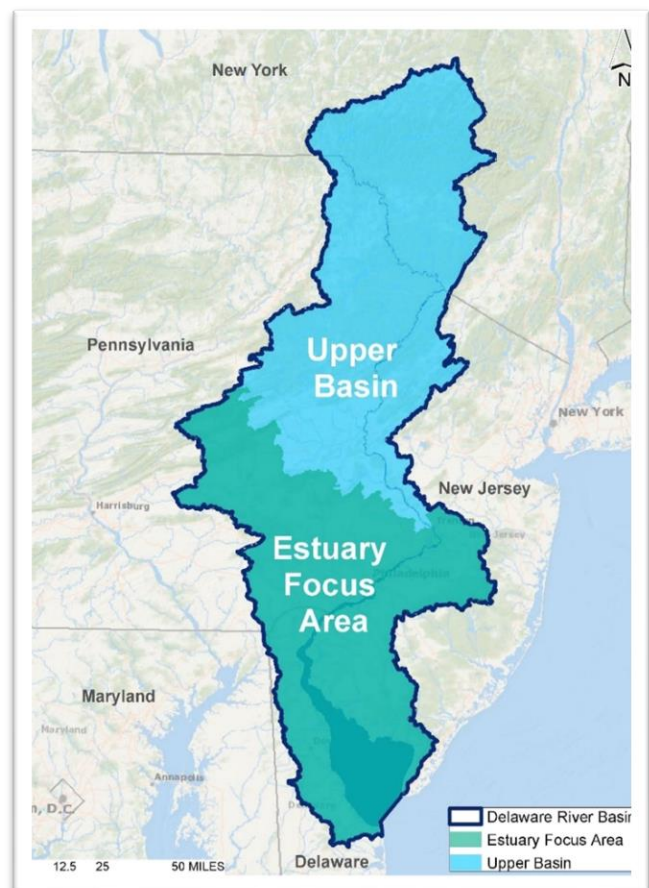
# Introduction

## The Delaware River Watershed and the Delaware Estuary Region

The Delaware River Watershed begins with a tiny spring in rural upstate New York and ends at the mouth of the mighty Delaware Bay. In between, it spans four states and drains 13,500 square miles of land. From its freshwater streams in the heavily forested upper portion of the watershed near Matamoras, PA to the head of tide in Trenton, NJ through the highly urbanized stretch around Philadelphia, Camden, Chester, and Wilmington, to the mouth of the Delaware Bay between Cape Henlopen and Cape May, the watershed covers a wide range of geographies and ecological conditions.

The Lenape people are the original inhabitants of this region. Their homelands span parts of Delaware, New Jersey, Eastern Pennsylvania, and Southern New York. For over 10,000 years, they have been the caretakers of the lands and the waterways that make up the Delaware River Watershed. Today, this watershed includes the National Wild and Scenic designated portions of the Delaware River above Trenton that provides the main stem flows necessary to sustain life in the Delaware Estuary; the mighty Schuylkill, Cooper, and Christina Rivers that have fueled the growth of cities and industry in the region for centuries; and the coastal plain rivers including the Broadkill and Maurice that support farms and fisheries. The rivers, creeks and streams that drain into this watershed sustain vibrant communities of fish and wildlife, and provides drinking water to millions of people that live, work, and play in this region.

The Delaware Estuary is the unique ecological area of the watershed where fresh and saltwater mix. It encompasses all of the lands and waterways that flow into the Delaware River and Bay below the head of tide at the Falls in Trenton, NJ and Morrisville, PA. The estuary supports a booming industrial region; one that contributes \$12 billion every year to the local economy and supports a designation as one of the nation's Urban Waters Federal Partnership locations. These waterways and open spaces also provide incredible recreational opportunities for hiking, fishing, boating, wildlife watching, and more. At approximately 6,800 square miles, the Delaware Estuary is one of the largest estuaries in the country and has been recognized as an estuary of ecological significance through its designation as a National Estuary Program by the U.S. Environmental Protection Agency (US EPA).



*The Delaware River Watershed and Estuary Focus Area*



## The Partnership for the Delaware Estuary

The Partnership for the Delaware Estuary (PDE) is a 501(c)(3) nonprofit organization dedicated to protecting the Delaware River and Bay by connecting people, science, and nature. PDE was founded in 1996, and in the years since then, has grown tremendously in both programming and staffing to fill vital needs related to partner coordination, scientific research, education, and restoration across the region.

Over the past 25 years, PDE has earned a strong reputation in the science and environmental fields and has a proven track record of leading multidisciplinary scientific and community engagement programs. PDE routinely brings together representatives from all levels of government, business and industry, academia, other nonprofits, and citizens to tackle the most pressing issues and needs facing the Delaware Estuary and the broader Delaware River Watershed.

At the core of PDE's work is its role as the host of, and partner in the Delaware Estuary Program (DELEP).

## The Delaware Estuary Program

DELEP is one of 28 [National Estuary Programs](#) (NEPs). The NEP is a non-regulatory program established by Congress and was authorized by section 320 of the Clean Water Act in 1987. NEPs provide a vehicle and resources for stakeholders to work together, using the best science available, to protect and enhance the nation's most important estuaries. NEPs focus on using collaboration, science, research, outreach, and education as tools to complement regulatory efforts to keep estuarine waterways clean and healthy.

In 1988, the governors of the states of Delaware, New Jersey, and Pennsylvania nominated the Delaware Estuary for inclusion in the NEP. In 1989, the Delaware Estuary Program (DELEP) Management Conference, which is the network of partners who manage and implement the program, was convened.

Since the creation of DELEP, the roles and responsibilities of the partners involved in the program have evolved considerably. At the heart of the Management Conference's joint efforts is a commitment to the implementation of the Comprehensive Conservation and Management Plan (CCMP) for the Delaware Estuary. This plan, which is updated every ten years, is intended to guide the collective efforts of environmental agencies and organizations in the region to protect and enhance the tidal Delaware River and Bay. In its most recent iteration, approved in 2019, it also considered needs and impacts in the Upper Basin of the Delaware River Watershed.

Since 2004, PDE has served as the host of DELEP and is responsible for working with partners to increase awareness, understanding, and scientific knowledge about the Delaware Estuary. PDE coordinates implementation of the CCMP, is responsible for the NEP deliverables required by the US EPA, and works to secure funding to support CCMP strategies.

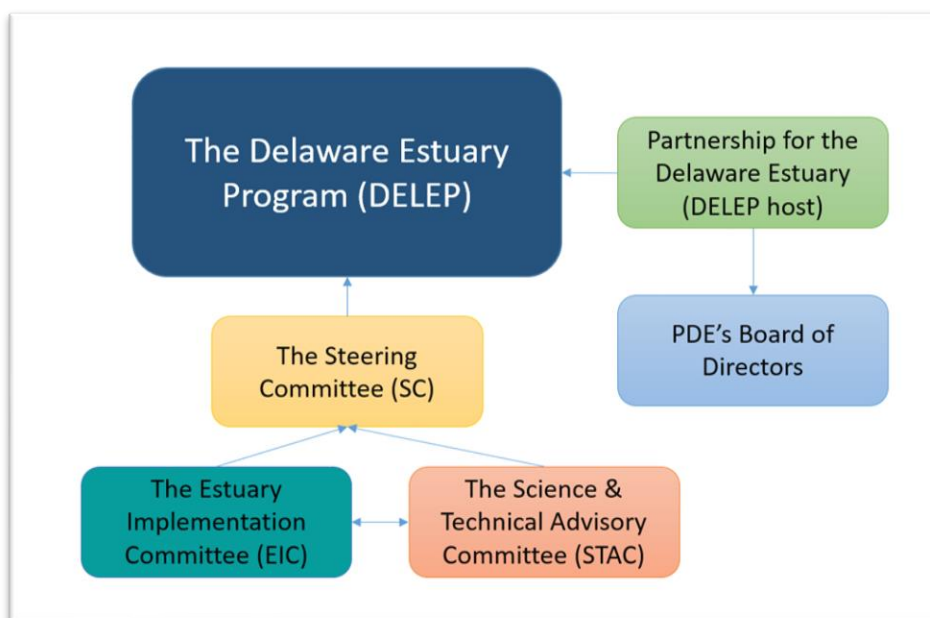
## The DELEP Management Conference

DELEP incorporates a diversity of stakeholders in its Management Conference through various elements of its structure. Broadly speaking, the Management Conference is made up of five groups, each charged



with collaborating and sharing resources and information in support of implementing the CCMP for the Delaware Estuary. Those groups are:

- **The Steering Committee (SC)** is comprised of appointed officials from the signatory partners identified as the “core NEP partners,” which includes the Delaware Department of Natural Resources and Environmental Control (DNREC), the New Jersey Department of Environmental Protection (NJDEP), the Pennsylvania Department of Environmental Protection (PADEP), Region 2 of the U.S. Environmental Protection Agency (EPA R2), Region 3 of the U.S. Environmental Protection Agency (EPA R3), the Delaware River Basin Commission (DRBC), the Philadelphia Water Department (PWD), and PDE’s Chair of the Board of Directors. The SC helps to set the overall policy and program direction for the NEP.
- **The Estuary Implementation Committee (EIC)** is made up of environmental managers from federal, state, regional, and local agencies, including but not limited to representatives of the core NEP partners. The EIC serves the role of the management committee, approving and reporting on projects and activities that help with the implementation of the CCMP.
- **The Science and Technical Advisory Committee (STAC)** is made up of members of the scientific and academic communities, including the public, private, and non-profit sectors. It operates in accordance with its own specific charter. The STAC provides technical advice and guidance to the DELEP partners.
- **The Partnership for the Delaware Estuary (PDE)** is an independent 501(c)(3) nonprofit which seeks to connect people, science, and nature in ways that help to promote, protect, and restore the invaluable natural resources of the Delaware River and Bay. PDE is a member of the management conference and serves as the organizational host of DELEP.
- **The PDE Board of Directors (Board)** is made up of private citizens and representatives from public and user interest groups, including business, industry, community, and environmental sectors. The Board is responsible for overseeing and supporting the operations of PDE as an independent nonprofit organization.



*An Overview of the Management Committee Structure*



## About this Strategic Plan

This plan is meant to serve as a visionary document and roadmap for PDE over the five-year period from 2022 through 2026. It outlines the high-level goals, objectives, structures, and needs of the organization to achieve the critical vision that PDE has created.

As with all plans, it is understood that the elements of this strategic plan are meant to serve as a guide. This is a living document, subject to change as best meets the needs of PDE, its partners, and its constituents. The structure and work laid out in this plan will be adaptively managed based on organizational capacity and the availability of sufficient resources to carry them out. PDE leadership will coordinate with staff and partners to periodically review progress, and make adjustments as needed to achieve PDE's mission and goals in an ever-changing world.

## Plans for Assessing Progress

PDE will use this strategic plan to develop annual work plans for each of the next five years. These work plans will include the development of measurable outcomes tied to annual activities in order to help PDE and its partners track progress against the goals of this plan and the CCMP. PDE will evaluate progress towards those annual work plans at the end of each year in order to inform the development of the next year's work plan.

By using this approach, the organization will be able to capture the metrics that apply directly to the work as it happens and will be better poised to adapt its activities and expectations in an ever-changing world.

At the end of the five-year lifespan of this strategic plan, PDE staff will collect and roll up the metrics developed and measured through each annual work plan review. Those metrics will be used to assess progress toward the goals outlined here and will also inform the development of future organizational strategic plans.



# PDE Today and Tomorrow

## PDE's Mission, Vision, Guiding Principles, and Core Values



### Our Mission

The Partnership for the Delaware Estuary, host of the Delaware Estuary Program, leads collaborative, science-based efforts to improve the Delaware River and Bay, which covers portions of Delaware, New Jersey, and Pennsylvania.



### Our Vision

We envision everyone working together for clean water, thriving fish and wildlife, and accessible recreational activities in and around the Delaware River and Bay to support people, communities, and a robust economy.



### Our Guiding Principles

- Treating all staff and partners with respect and integrity and encouraging listening, support, and collaboration as we engage in meaningful work.
- Serving as a platform to promote and celebrate positive environmental work done by stakeholders across the Delaware River Watershed.



### Our Core Values

- **Collaboration** – working together across many different sectors and jurisdictions to set common goals, share responsibility for actions, and achieve powerful results.
- **Science** – using science as an objective basis for decision-making and holistic action.
- **Innovation** – combining science and forward-looking creativity to develop and implement new and better tools, projects, and programs.
- **Engagement** – promoting knowledge and stewardship of stakeholders with integrity, respect, and objectivity.

## PDE's Overarching Themes

The future of our organization is focused on four critical themes. Three programmatic themes: **Clean Waters**, **Healthy Habitats**, and **Strong Communities** are aligned with the CCMP for the Delaware Estuary and made possible by a fourth support theme to continue to build and maintain an **Effective Organization**. These goals set direction for continuous improvement of the health of the Delaware River and Bay through sustained momentum of current successful science-based activities and new high-priority activities.





*PDE's Primary Organizational Goals*

The three programmatic themes are interwoven both intrinsically by their nature and by how PDE approaches its work in these areas. PDE emphasizes interdisciplinary efforts and holistic solutions to environmental problems, as well as identifying and filling gaps in the region in order to avoid redundancy and maximize the impact of limited resources. The support theme makes PDE's work towards the programmatic themes possible by sustaining the underlying organizational structures that enables the critical work to be accomplished.

## Priority Goals

Under the umbrellas of the four themes identified above, PDE has established five priority goal areas where efforts will be concentrated over the next five years. They are:

- **Capacity Building Goals** – enable PDE to develop organizational infrastructure and resources commensurate with current needs and planned growth, and ensure interdepartmental integration
- **Science-Based Goals** – build on the strong credibility that PDE has earned in the environmental field by zeroing in on the emerging and priority issues that PDE can affect through hands-on research and applied science
- **Public and Partner Engagement Goals** – utilize PDE's skills at bringing together stakeholders from many different sectors and empowering them, through education and facilitation, to take action to improve the health of the Delaware River and Bay



- **Resource Development and Advancement Goals** – position PDE to attract greater financial resources on behalf of the organization and the watershed as a whole, increasing the number of projects and programs dedicated to improving water quality across the region
- **Business Administration and Management Goals** – provide the underlying supports and structures that enable PDE to carry out high-quality research, partnership building, and effective project implementation

Each of these goals are discussed in more depth in the following sections. Each section will also include key objectives related to the goals, along with implementable actions PDE will undertake over the next five years. Those actions are broken out into areas of continuity (i.e., programs and efforts that are already part of PDE’s portfolio and have been identified as being critical to continue) and areas of growth (i.e., new program areas and initiatives for PDE to explore, build, and/or integrate into the organization’s work portfolio over the next five years).

### Signature Initiatives

Beyond the priority goals, this plan includes a section dedicated to **Signature Initiatives**. While not fitting neatly into any single goal, the items detailed in this section represent major areas of growth for PDE over the lifetime of this plan. Specifically, this section includes plans for the Mussels for Clean Water Initiative (MuCWI) and Freshwater Mussel Hatchery being built in Philadelphia.

### Connections to the Delaware Estuary CCMP

As mentioned previously, PDE works to help implement the CCMP for the Delaware Estuary. Over the next five years, PDE will focus on implementation of 30 out of the 39 CCMP strategies that are directly related to PDE’s areas of expertise and organizational strengths. They are listed in the chart below, and also noted in the plan’s sections on strategy areas and special projects.

Delaware Estuary CCMP Strategies Connected to PDE’s 5 Year Strategic Plan		
CCMP Theme	#	Strategy Language
Clean Waters	W1.1	Promote infrastructure-related improvements to reduce pollutants from point sources
Clean Waters	W1.2	Support innovative planning and design practices to reduce nutrients from stormwater and agricultural runoff through promotion, education, and implementation
Clean Waters	W1.3	Promote land use planning by local municipalities that prevents, reduces, and/or more efficiently manages stormwater runoff to prevent pollution
Clean Waters	W1.4	Provide outreach and information to property owners to assist in reducing non-point sources of nutrients



Clean Waters	W2.1	Conduct outreach and technical assistance programs to reduce non-point sources of contaminants
Clean Waters	W2.2	Promote the identification, cleanup, and revitalization of contaminated sites
Clean Waters	W2.3	Support adaptive management and reporting of pollution reduction
Clean Waters	W2.5	Conduct and coordinate (where appropriate) education, research, monitoring, and communication about fish and shellfish consumption to protect human health
Clean Waters	W3.1	Inform and collaborate with decision-makers and water resource managers to ensure that main-stem Delaware River flow meets the needs of the Delaware Estuary
Clean Waters	W3.2	Conduct research and monitoring on water quality and habitat requirements of estuary dependent species
Strong Communities	C1.2	Provide tools and technical assistance to waterfront communities and partners to improve economic and environmental resilience
Strong Communities	C1.3	Protect and enhance natural areas and public access
Strong Communities	C1.4	Connect people to natural areas and waterfronts in the Delaware Estuary
Strong Communities	C2.1	Through marketing and communications, build awareness and brand for the Delaware River and Bay
Strong Communities	C2.2	Utilize events to increase stewardship and engage new people
Strong Communities	C2.3	Develop and promote programs that engage teachers and schools in stewardship of the Delaware Estuary
Strong Communities	C2.4	Develop and promote programs with local communities and partners that foster volunteer stewardship and experiential learning
Strong Communities	C2.5	Publish and share outreach materials and scientific results
Strong Communities	C2.6	Engage key stakeholders to coordinate science and management of the Delaware Estuary
Strong Communities	C2.7	Monitor, develop, and promote opportunities to assess impacts of outreach
Healthy Habitats	H1.1	Establish clear baselines for tidal wetland conditions and track changes over time
Healthy Habitats	H1.2	Restore, enhance, and manage tidal wetlands for maximum health and resilience
Healthy Habitats	H1.3	Develop and implement natural and nature-based techniques to stabilize and restore eroding shorelines, and build and protect wetlands, infrastructure, and other key resources
Healthy Habitats	H1.4	Protect, enhance, and improve non-tidal wetlands
Healthy Habitats	H2.2	Promote stewardship practices by local partners for the health and sustainability of forests for water quality
Healthy Habitats	H2.3	Protect and manage high-value and threatened forests for water quality
Healthy Habitats	H3.1	Inventory, map, protect, and enhance habitat critical for fish and crabs



Healthy Habitats	H3.2	Restore oyster beds and productivity in and around Delaware Bay
Healthy Habitats	H3.3	Inventory, restore, and manage mussel populations
Healthy Habitats	H3.5	Manage and improve populations of rare, endangered, or otherwise important native species in the Delaware Estuary

It should be noted that the chart above does not touch upon every strategy listed in the 2019 revised Delaware Estuary CCMP. The CCMP is a plan for all of the partners in the Delaware Estuary region, not just PDE. Strategies not included in this plan are actively being championed by other organizations and entities, which is critical for the overall implementation of the plan. PDE recognizes the importance of the work done by others in support of clean water, healthy habitats, and strong communities.

The [entire text of the CCMP](#) can be accessed online via PDE's website.



## Capacity Building Goals

Objectives and actions under the Capacity Building Goals seek to enable PDE to develop organizational infrastructure and resources commensurate with current needs and planned growth. These strategies also seek to ensure interdisciplinary and interdepartmental integration at both the programmatic and organizational scale.

### Objectives

- Continue to position PDE as a thought leader in the region on issues related to clean water, healthy habitats, and strong communities
- Invest in and facilitate employee growth opportunities and retention initiatives
- Expand board and committee capacity and engagement in order to best support the organization through projected periods of growth
- Ensure physical infrastructure, resources, systems, and staffing are sufficient to support programmatic and organizational goals
- Support cross-programmatic and interdepartmental connections to build more holistic projects and programs
- Strengthen PDE's impact on public policy through collaboration, the formation of strategic alliances, and relationship building with government agency leaders and elected officials at the local, state, and federal levels

### Actions

- **Areas of Continuity:**
  - Recruit board and committee members with specific skill sets to help advance our capacity in critical areas (e.g., fundraising, communications, systems optimization, legal assistance, contracting, human resources, etc.)
  - Expand staff capacity through strategic departmental growth in personnel, and through increased access to the resources necessary to carry out programmatic and administrative work
  - Cultivate and expand partnerships with local, regional, and national organizations to support programming in ways that are consistent with the CCMP
  - Build alliances and partnerships with new sectors that have not traditionally been viewed as having shared goals.
  - Support the creation and utilization of inter-departmental teams to carry out projects and address organizational needs.
  - Evaluate market trends and data regularly in order to remain competitive in the market and recruit and retain the most talented individuals into the organization



- **Areas of Growth:**

- Provide professional development opportunities for staff on topics such as management and supervision, systems optimization, and others as identified by staff and leadership
- Identify and maximize the skills, talents and resources of our board members to maximize engagement and support
- Identify opportunities to provide board training in the areas of fundraising, board recruitment and cultivation, and other skills as identified by board members and leadership
- Assess, identify, and acquire the necessary physical infrastructure to support the organization, including future office space, storage space, and major equipment needs
- Explore opportunities to expand PDE programming across the region and into the upper reaches of the Delaware River Watershed as opportunities to advance CCMP and PDE goals arise
- Prioritize the intentional cultivation of staff and board of directors that is reflective of the populations PDE serves
- Expand membership of the Estuary Program's Management Conference to include additional partners that can help advance CCMP implementation
- Develop and assign staff and resources to implement a new government relations program for PDE
- Identify key existing and potential legislative champions and begin outreach to them and their staff to build and solidify relationships

## Science-Based Goals

Objectives and actions under the Science-Based Goals seek to build upon the strong credibility that PDE has earned by zeroing in on the emerging and priority issues that PDE can affect through hands-on research and applied science.

### Objectives

- Restore mussel beds and oyster reefs for clean water and other benefits (*W3.2, H3.1, H3.2, H3.3, H3.5*)
- Develop nature-based restoration and resilience approaches (*H1.2, H1.3, H1.4, H2.2, H2.3*)
- Track and understand coastal wetland status, trends, and benefits (*W2.5, H1.1, H1.2, H1.4, H3.3*)
- Implement strategic prioritization approaches using principles of ecological economics (*H1.3, H2.2, H3.3*)
- Guide management and policy using watershed science and ecosystem-based knowledge (*W3.1, C2.6*)

### Actions

- **Areas of Continuity:**



- Convene and coordinate with regional scientific partners to share findings and address emerging needs
  - Track environmental conditions and trends in the watershed to better prioritize monitoring, scientific, and management actions
  - Lead innovative research programs to develop a better understanding of the value of natural resources and nature-based infrastructure
  - Sustain spatial and temporal monitoring of key habitats that supply vital benefits for clean water, coastal resilience, and other needs
  - Develop and promote science-based tools to facilitate strategic decision making by environmental managers and policy makers
- **Areas of Growth:**
    - Expand toolkits available for strategic decision makers with enhanced return on investment datasets to guide future investments
    - Scale up the [Mussels for Clean Water Initiative](#) with an emphasis on the PDE-led, Philadelphia- based mussel hatchery
    - Research the actual net ecological benefits of shellfish investments such as the Mussels for Clean Water Initiative and living shoreline projects
    - Expand ecosystem service research, monitoring and evaluation for key metrics (e.g., carbon capture, nutrient processing, coastal resilience, fish and wildlife) and habitats (e.g., coastal marshes, forests, benthic such as shellfish beds, SAV, etc.)
    - Develop innovative restoration and enhancement tactics utilizing nature-based approaches, and perform research to quantify the net ecological outcomes of such projects (e.g., Mussels for Clean Water Initiative, living shorelines, rain gardens, etc.)
    - Explore the development of new partnerships and projects to address gaps that inhibit CCMP monitoring and implementation
    - Identify opportunities to expand the public accessibility of science/scientific information related to PDE or DELEP science initiatives

## Public and Partner Engagement Goals

Objectives and actions under the Public and Partner Engagement Goals seek to utilize PDE's skills at convening stakeholders and empowering them to take action to improve the Delaware River and Bay.

### Objectives

- Elevate source water protection in planning and restoration (*W1.1, W1.2, W1.3, W2.2, H2.2*)
- Support community-level climate resiliency (*C1.2, C2.5*)
- Promote equitable access to green space and waterways (*C1.2, C1.3, C1.4*)
- Engage communities around pollution prevention and reduction (*W1.2, W1.3, W1.4, W2.1, W2.3, C2.2, C2.3, C2.4, C2.5, C2.7*)



## Actions

- **Areas of Continuity:**
  - Provide facilitation and administrative support for regional collaborative initiatives, including the [Schuylkill Action Network \(SAN\)](#), the [Delaware Resilient and Sustainable Communities League \(RASCL\)](#), and the [Delaware River Watershed Initiative \(DRWI\)](#)
  - Provide high quality, engaging public events including the annual Delaware River Festival and Wilmington Earth and Arbor Day
  - Create and implement educational, community-based programming to raise public awareness about water resources and pollution prevention (i.e., green stormwater management, litter prevention, etc.)
  - Support the transfer of resources and information between different regional groups, as well as between state and federal agencies and local community organizations
- **Areas of Growth:**
  - Develop and strengthen partnerships with community-based organizations and individuals in priority community hubs in Wilmington, Philadelphia, the New Jersey Bayshore, and other areas as opportunities arise in order to create meaningful local environmental projects and programming
  - Facilitate and grow the [Delaware River Location of the Urban Waters Federal Partnership Program](#) in Philadelphia, Wilmington, Chester, and Camden to maximize the collective impact of partners and support urban communities in addressing environmental challenges
  - Explore and cultivate opportunities for new source water protection collaboration in geographies, including in the greater Philadelphia area beyond the Schuylkill Watershed
  - Expand resources for both coastal and upland communities to better understand and mitigate the impacts of recurring extreme weather events
  - Encourage the incorporation of public access to nature, environmental health, and climate adaptation into planning and project implementation efforts by partners, communities, and initiatives with which PDE is involved



## Resource Development and Advancement Goals

Objectives and actions under the Resource Development and Advancement Goals seek to position PDE to attract greater awareness of, interest in, and financial resources for the organization and the Delaware River and Bay as a whole, leading to increasing the number of projects and programs dedicated to improving water quality across the region.

### Objectives

- Increase and diversify funding to support PDE and CCMP implementation through the expansion of individual giving, grant writing, corporate support, fundraising events, and fee for service programs (*Finance Strategy*)
- Raise PDE's profile and promote the organization's work by building public affinity for PDE through strategic and innovative communications programming (*C2.1, C2.2, C2.4, C2.5*)

### Actions

- **Areas of Continuity:**
  - Maintain a robust grant writing program to support PDE projects and programs, with a strategic focus on larger-scale, multi-year funding opportunities
  - Leverage funding from the Infrastructure and Investment Jobs Act (IIJA) to implement CCMP priorities and organizational goals
  - Work with regional partners to establish a dedicated pot of funding for CCMP implementation through the passage of a Federal Geographic Program Act for the Delaware River and Bay
  - Host PDE's annual gala celebration and other fundraising and donor stewardship events
  - Maintain existing donor base and continue to cultivate new corporate and individual donors
  - Elevate PDE's public presence through PDE's website, social media, and email/print communications
- **Areas of Growth:**
  - Build a major donor program to grow PDE's unrestricted funding
  - Prioritize relationship building with funders to expand private foundation grants and corporate donations to diversify PDE's funding portfolio
  - Implement a major capital campaign to support the Mussels for Clean Water Initiative and mussel hatchery construction efforts
  - Attract more media attention for PDE's efforts through robust marketing efforts
  - Update PDE's strategic communications plan, brand guidelines, and related standard operating procedures



## Business Administration and Management Goals

Objectives and actions under the Business Administration and Management Goals seek to provide the underlying structure and business support systems that enable PDE to serve as the host of DELEP and implement CCMP strategies in the areas of restoration and research, partnership building, and effective project implementation.

### Objectives

- Support and maintain PDE's financial systems
- Manage business relationships with vendors and contract managers
- Provide strong administrative and financial backbone for programmatic work
- Sustain a workplace environment that is positive and supportive

### Actions

- **Areas of Continuity:**
  - Review and streamline internal administrative processes and procedures
  - Review and administer staff compensation and benefit packages
  - Support day-to-day business operations, including payroll, invoicing, accounting support, contract review, and office management
  - Oversee hiring, employee onboarding & exiting, and information and technology needs
  - Connect staff with human resources support through external PDE human resources consultants as needed
  - Develop, maintain, and update organizational standard operating procedures
- **Areas of Growth:**
  - Expand administrative capacity through additional staffing and resource dedication to meet organizational growth needs
  - Review industry-wide operational best practices and strategies for advancing PDE's organizational sustainability and achieving programmatic and administrative goals
  - Connect, integrate, and upgrade internal and external tools and systems to streamline and increase efficiency
  - Assess PDE's future human resource needs to determine strategies for internal expansion or continued outsourcing



## Signature Initiatives

### Mussels for Clean Water Initiative and the Freshwater Mussel Hatchery

#### Background

The Mussels for Clean Water Initiative (MuCWI) is part of the multifaceted Freshwater Mussel Recovery Program (FMRP), which aims to restore native species of freshwater mussels to streams, rivers and lakes in the upper mid-Atlantic region, particularly the Delaware and Susquehanna River Basins.

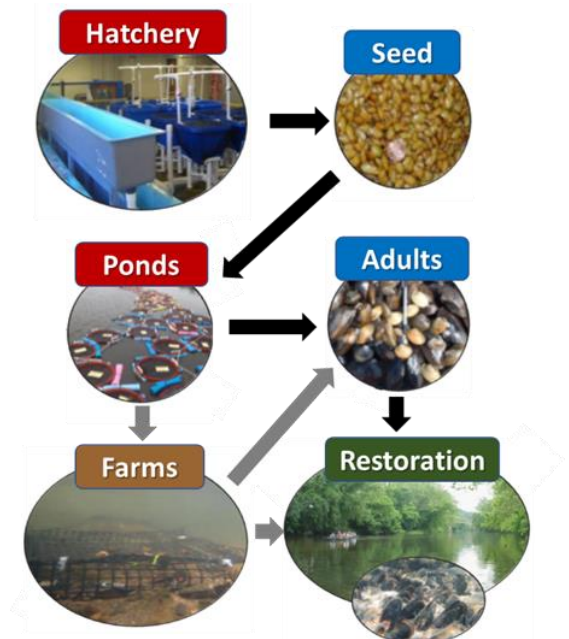
Freshwater mussels are bivalve mollusks just like oysters, clams, and saltwater mussels. They provide valuable “ecosystem services,” or natural benefits, such as strengthening stream beds by keeping soils in place and providing food and habitat needed by other animals and plants. As filter-feeders, mussels supply another important service by cleaning the water in which they live. They suck water in and trap solids such as dirt, algae, and other pollutants. Then they release the clean filtered water back into the environment. One mussel bed studied in Southeast Pennsylvania was found to remove 26 metric tons of solids from the water in a single summer season—as much as five grown elephants!

Freshwater mussels are one of the most imperiled groups of animals in North America, and existing conservation and restoration efforts have mainly focused on saving the rarest mussel species from extinction. MuCWI is different because it aims to directly restore natural mussel assemblages of both rare and common species with the main goal of enhancing ecosystem services like clean water.

Since wild mussel populations are so depleted, a major constraint on restoration, research and education programs for the FMRP is mussel supply. MuCWI will alleviate this bottleneck via the propagation, rearing and installation of mussels created from a central hatchery.

#### Objectives

- Understand where freshwater mussels currently are and are not within the Delaware River Basin and broader region (H3.3)
- Conserve and protect native species of freshwater mussels where they still exist (H3.3, H3.5)
- Restore native species of freshwater mussels to waterbodies where they have been lost (H3.3, H3.5)
- Include freshwater mussel beds as a component of nature-based habitat enhancement projects to improve water quality and ecological conditions (H3.3)
- Raise awareness for the value and effectiveness of freshwater mussel-based environmental investments and restoration potential (H3.3, C2.1, C2.3, C2.5)



Anticipated Implementation Phases for MuCWI Work



## Actions

- Develop a geospatial dataset documenting where freshwater mussels currently live and where they have historically been located within the Delaware River Basin and broader region
- Build a hatchery and rearing network, and key partnerships for large-scale mussel propagation to supply animals for restoration, research and education programs throughout the region
- Complete a successful capital campaign to build and launch the freshwater mussel hatchery at Bartram’s Garden in Philadelphia
- Design and construct the hatchery to be operational by 2024
- Develop a regional mussel restoration plan and network of rearing facilities and partnerships
- Refine mussel propagation and rearing practices to enhance success, including genetics and disease management
- Propagate and rear up to half a million baby mussels per year
- Innovate new restoration and water quality enhancement practices using produced freshwater mussels at regional project sites
- Continue public outreach and propagation research at the Fairmount Water Works Mussel Hatchery exhibit and other partner facilities
- Expand PDE’s engagement programming around freshwater mussels to build public awareness of and affinity for mussel restoration and clean water
- Determine whether freshwater mussel conservation and restoration can be used for regulatory purposes for water quality improvements



## Acknowledgements

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