MORRO BAY
NATIONAL ESTUARY PROGRAM

Program Evaluation Narrative

July 1, 2019 to September 30, 2024

Morro Bay National Estuary Program
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Contents

Introduction

Since its designation under the Clean Water Act (CWA), the Morro Bay National Estuary Program (MBNEP) has been a leader in restoration, monitoring, and education efforts in the Morro Bay estuary and its watershed. The Comprehensive Conservation and Management Plan (CCMP), first approved in 2001 and regularly updated, provides direction not only for the MBNEP itself but for its many partners working in the Morro Bay area. Through the efforts of the MBNEP and our partners, thousands of acres of land have been preserved through public acquisition and conservation easements; a robust monitoring program has compiled water quality, habitat, and project performance data used by federal, state, local, and private partners for over 20 years; best management practices have been introduced throughout the open space in the watershed, including on public lands, farms, and ranches; altered floodplains have been acquired and restored; sensitive habitats have been protected and restored; commercial oyster farming has expanded; terrestrial and aquatic invasive species have been reduced; and public awareness of and participation in the protection of the bay has increased. The MBNEP leverages the funding provided through Clean Water Action (CWA) Section 320 and the Infrastructure Investment and Jobs Act (IIJA) to protect, restore, and enhance the Morro Bay.

This Program Evaluation (PE) Narrative summarizes the accomplishments, program implementation, and ecosystem & community status for the MBNEP for the period from July 1, 2019 (Fiscal Year (FY) 2019) through September 30, 2024 (FY 2024).

Some preliminary notes on programmatic accomplishments and challenges. During the PE period, the The MBNEP achieved significant program accomplishments. The CCMP was updated and revised to reflect the latest science, partnerships, and priorities. An extensive Conservation Planning Initiative, developed with the expertise of a technical advisory committee, resulted in better indicators for the health of habitats and special species and the eventual creation of a Habitat Protection & Restoration Strategy (HPRS). The MBNEP presented its triennial “State of the Bay” report cards in 2020 and 2023 and sponsored numerous related public events. And, perhaps most importantly, progress on the implementation of most of the CCMP action plans occurred.

At the same time, there were significant challenges that arose during this PE period. First was the COVID pandemic that required the development of a wide range of responses related to staffing, management, and workplace logistics. Especially impactful was the necessary suspension of the longstanding Volunteer Monitoring Program (VMP) that had relied on a large cadre of highly trained community volunteers. To preserve the extensive datasets and long-term trends developed through the VMP, staff took on much of the field work themselves.

Prior to the PE period, the bay’s eelgrass beds suffered a dramatic and unprecedented die off. By the end of 2019, the beds had made a modest recovery but the cause of the loss and the best approaches to restoration were not fully understood. During the PE period, extensive restoration work continued: methodologies for successful transplants were greatly refined; studies of the potential causes and remedies were undertaken with scientists from public agencies and universities; and ongoing and improved monitoring better tracked and assessed changes in the habitat. By the end of the PE period, eelgrass beds were measured at acreages well above historic averages, the recovery likely due at least in part to the MBNEP’s restoration work.

Also, during the PE period, the area experienced two extraordinarily rainy winters on the heels of an extended drought. While there are benefits from the wet weather, intense rainfall resulted in widespread flooding in the watershed that altered streams, created new erosion issues, and damaged restoration work that had to be subsequently evaluated and repaired.

During this time, a new Executive Director was hired. Additional staff were brought on board with the addition of the IIJA funding mid-way through the PE period.

Overcoming these challenges while still generating a long list of noteworthy accomplishments speaks to the stability and robustness of the program.

The many roles of the MBNEP. As noted above, the MBNEP and our CCMP provide a shared vision and focus for much of the water quality and habitat work in the estuary and watershed. The program provides a recognizable platform for coordination among government agencies, nonprofits, businesses, and the community regarding estuarine and watershed issues. The MBNEP staff regularly helps partners develop project priorities and funding sources; provides a wide range of technical assistance on projects; assists with grant applications and grants management; and conducts pre- and post-project monitoring. The MBNEP sponsors, contributes, and supports scientific research, educational and training programs, and a wide range of community outreach activities. The MBNEP also conducts important and long-running water quality and habitat monitoring under an EPA-approved Quality Assurance Project Plan (QAPP), including a volunteer program that trains community members in appropriate protocols to conduct water quality monitoring and other field work. The monitoring data is used by various nonprofits, landowners, and federal, state, and local agencies.

In some cases, the MBNEP works directly with partners on projects that support CCMP implementation. The program obtains grants and works with partners to leverage its funding to support major projects. The program has always achieved its federal match requirements and has been successful in garnering federal, state, and local grants, as well as support from community nonprofits and foundations. Reliable funding from CWA 320 and more recently from IIJA provide much of the operational costs such as staff, office space, equipment, and training essential to the MBNEP's success.

Topic 1: NEP Environmental/Programmatic Workplan Accomplishments including IIJA work

Morro Bay and its surrounding watershed provide habitat for diverse plant and animal species, support commercial and recreational activities, and serve as a vital resource for the local community. However, this ecosystem faces ongoing challenges, including habitat degradation, declining water quality, and the impacts of extreme weather events. The MBNEP works to protect and restore the estuary and watershed by implementing science-based conservation strategies, engaging local stakeholders, and fostering long-term stewardship.

Since its inception, the MBNEP has taken a collaborative approach to conservation, working alongside federal, state, and local agencies, academic institutions, nonprofit organizations, landowners, and community members. Through these partnerships, the MBNEP has been able to implement meaningful restoration projects, conduct long-term environmental monitoring, and provide education and outreach opportunities that inspire stewardship and advocacy for the estuary.

Guided by the CCMP, the MBNEP focuses its efforts on addressing the most pressing environmental issues facing the Morro Bay watershed. The CCMP provides a strategic framework for the MBNEP's initiatives, ensuring that projects are aligned with long-term goals for healthy ecosystems, good water quality, and an engaged community. Over the past five years, the MBNEP has continued to make progress in implementing priority action items from the CCMP, adapting to new challenges and opportunities to maximize its impact.

The MBNEP's work falls into three key focus areas:

- **Healthy ecosystems** efforts restore and enhance vital habitats, including eelgrass beds, wetlands, riparian corridors, and uplands. The MBNEP also works to manage invasive species, improve fish passage, and advance scientific research to support adaptive management. By improving habitat conditions and addressing threats to biodiversity, the MBNEP helps ensure the long-term resilience of the estuary and watershed.
- **Clean water** initiatives protect and improve water quality in the bay, creeks, and groundwater. The MBNEP works with landowners and partners to implement watershed-based best management practices, reduce sediment and bacteria inputs, and improve stormwater management. Long-term monitoring programs track key environmental indicators, providing the data needed to guide decision-making and evaluate the success of conservation efforts.
- **Strong communities** programs foster public engagement, environmental education, and stewardship. Through volunteer programs, community cleanups, educational outreach, and public space improvements, the MBNEP strengthens local connections to the estuary and watershed. These efforts ensure that residents, students, and visitors have opportunities to learn about and participate in conservation, inspiring a shared commitment to protecting Morro Bay's natural resources.

Each of the following sections—Healthy Ecosystems, Clean Water, and Strong Communities—begins with an overview of key initiatives, followed by selected project highlights that showcase the MBNEP's impact, and concludes with a comprehensive table summarizing project activities, outcomes, accomplishments, and lessons learned.

Healthy Ecosystems:

Healthy Ecosystems: Introduction

The MBNEP works to protect and restore critical habitats, biodiversity, and ecological resilience across the Morro Bay watershed. Through habitat restoration, invasive species management, scientific research, and conservation easements, the MBNEP ensures that wetlands, riparian corridors, eelgrass beds, and uplands continue to support wildlife, water quality, and long-term sustainability.

Key initiatives include:

- Eelgrass Restoration & Research – Transplanting eelgrass, tracking habitat health, and researching factors influencing decline and recovery.

- Riparian and Floodplain Enhancement – Restoring fish passage, improving riparian habitat, and improving floodplain function to enhance steelhead habitat, increase groundwater recharge, and reduce flooding
- Invasive Species Management – Removing Arundo, tamarisk, iceplant, and other priority invasive species to improve ecosystem function and native biodiversity
- Conservation Easements & Land Protection – Partnering with landowners to protect over 900 acres of priority habitat and agricultural lands
- Best Management Practices (BMPs) – Implementing erosion control, rangeland improvements, and sustainable land management
- Fish & Wildlife Monitoring – Tracking fish populations, wildlife movement, and shellfish aquaculture to inform habitat restoration and adaptive management
- Research & Planning – Conducting historical ecology studies, saltmarsh monitoring, and coastal dune assessments to guide long-term conservation strategies

Healthy Ecosystems: Project Highlights

Healthy Ecosystems: Eelgrass Restoration and Research in Morro Bay (FY19-24)
Eelgrass beds are among the most critical habitats in the Morro Bay estuary, providing biodiversity support, erosion control, water quality improvements, and carbon sequestration. However, by the 2010s, eelgrass suffered a severe decline, shrinking from historic levels to just 13 acres in 2017—less than 4% of past coverage. Recognizing the urgent need for action, the MBNEP took the lead in developing a comprehensive restoration strategy to address this loss.

During the FY19 to FY24 period, the MBNEP implemented a multifaceted approach to eelgrass restoration, focusing on:

- Transplanting healthy eelgrass specimens across multiple locations in the bay (FY19-22)
- Monitoring hydrologic and water quality conditions to assess factors influencing eelgrass growth (FY19-ongoing)
- Conducting research into the causes of decline and the conditions supporting natural recovery (FY19-ongoing)
- Establishing long-term monitoring sites to track eelgrass health, flowering, and seed production (FY19-ongoing)

Through these efforts, the MBNEP has contributed valuable insights and restoration techniques to support eelgrass recovery in Morro Bay. By 2023, eelgrass extent had expanded to over 750 acres, a dramatic increase from 42 acres in 2019. While this rebound suggests favorable environmental conditions that include bay elevation, water quality, and short- and long-term weather patterns, the research, restoration, and monitoring efforts of the MBNEP and its partners have played an important role in supporting the remnant eelgrass beds and tracking their recovery. With 83% of restoration sites showing growth, the MBNEP's work has helped inform adaptive management strategies to support eelgrass resilience.

Beyond restoration, the MBNEP played a pivotal role in advancing eelgrass research, contributing to a greater understanding of transplant success factors, sedimentation dynamics, and species interactions. Key studies have examined eelgrass prokaryote communities, slime mold and wasting disease, the effects of crab populations, and the role of Black Brant grazing in eelgrass health. Lidar surveys in 2019 and 2022 supported analysis of bay elevation changes with eelgrass decline and recovery. These research efforts provide valuable, transferable insights for seagrass conservation at regional and national levels.

The MBNEP's success in eelgrass research and restoration demonstrates the importance of science-based adaptive management, long-term monitoring, and strong partnerships. By leveraging Environmental Protection Agency (EPA) 320 Base and IIJA funding, the MBNEP has ensured the sustainability of these efforts, aligning with the CCMP and reinforcing the long-term ecological health of the Morro Bay estuary.

Healthy Ecosystems: Chorro Creek Ecological Reserve Restoration (FY19-24)

In 2004, the MBNEP facilitated the acquisition of a 580-acre site along Chorro Creek to support floodplain and riparian habitat restoration. Transferred to the California Department of Fish and Wildlife (CDFW) for long-term management as an ecological reserve, this site has since become a critical demonstration area for large-scale floodplain restoration. The project aimed to reestablish natural hydrological processes, enhance critical habitats, and improve overall watershed function.

During the FY19 to FY24 period, the MBNEP played a key role in the design, permitting, and implementation of restoration efforts. The project focused on restoring 4.8 acres of floodplain and 4,280 linear feet of creek channel by:

- Breaching levees to reconnect the floodplain
- Creating side channels to improve floodplain connection and habitat complexity
- Lowering floodplain elevations to support native riparian vegetation and sediment capture
- Installing large wood structures and willow baffles to slow creek flows and enhance in-stream habitat
- Planting native riparian vegetation to support wildlife and improve ecosystem resilience
- Stabilizing a creek road crossing to prevent erosion and sediment input

Following implementation, the MBNEP led post-construction monitoring to evaluate project success, assess how the restored floodplain functioned during significant storm events in 2023 and 2024, and identify areas for repair and replanting. These extreme weather events tested the resilience of the restoration, reinforcing the importance of ongoing monitoring and adaptive management to sustain long-term ecological benefits.

This project serves as a model for floodplain restoration, demonstrating how restored ecosystems can capture sediment, improve hydrology, and support habitat recovery in the face of environmental fluctuations. The MBNEP's leadership in funding acquisition, planning, implementation, and long-term monitoring provides valuable, transferable knowledge for other Central California restoration efforts, reinforcing the importance of science-based, collaborative conservation strategies.

Healthy Ecosystems: Steelhead Habitat Restoration Through Invasive Species Reduction and Monitoring (FY19-24)

Steelhead trout, an ecologically and culturally significant species in Central California streams, face numerous challenges due to invasive species, habitat degradation, and migration barriers. Recognizing the need for targeted conservation efforts, the MBNEP launched a multi-year project to reduce invasive species, enhance habitat conditions, and monitor fish movement within the Morro Bay watershed. This project, in collaboration with the CDFW, integrates species management and long-term data collection to inform adaptive conservation strategies.

A key component of this effort is the reduction of Sacramento pikeminnow, an invasive predatory fish that preys on young steelhead and competes for habitat resources. Using targeted electrofishing techniques, the project team has worked to reduce pikeminnow populations and improve conditions for steelhead survival and reproduction. Additionally, monitoring efforts include:

- PIT (Passive Integrated Transponder) tagging to track steelhead growth, movement, and migration corridors (FY23-24)
- Spawner surveys to assess population trends and habitat usage
- Environmental DNA (eDNA) sampling to detect steelhead presence upstream and downstream of migration barriers (FY24-ongoing)

While steelhead recovery is influenced by a range of environmental factors including streamflow, water quality, and habitat availability, this project has contributed critical data and management techniques that support long-term steelhead conservation efforts. By integrating cutting-edge monitoring tools and adaptive species management, the MBNEP has helped establish a more comprehensive understanding of steelhead behavior within the watershed and provided valuable data for regional and statewide restoration initiatives.

Beyond the immediate benefits of invasive species reduction, this work is helping to refine steelhead conservation strategies across Central Coast streams. By leveraging EPA 320 base and IIJA funding, and working in partnership with state agencies, researchers, and local conservationists, the MBNEP continues to support resilient aquatic ecosystems and long-term steelhead recovery in the Morro Bay watershed.

Healthy Ecosystems: Enhancing Resilience through Salt Marsh Habitat Monitoring (FY23-24)

Tidal marsh habitats in Morro Bay play a critical role in supporting biodiversity, improving water quality, and serving as natural buffers against storm surges and extreme weather events. However, these habitats face growing environmental pressures that could alter their long-term stability.

To better understand how these marshes are responding to changing environmental conditions, the MBNEP has partnered with the U.S. Geological Survey (USGS) and other researchers to monitor saltmarsh elevations and sediment deposition for nearly two decades. This long-term effort provides valuable insights into habitat resilience and future shifts in marsh structure.

By integrating decades of data, the MBNEP and its partners aim to track habitat changes over time, identify key resilience thresholds, and explore adaptive management approaches that will help maintain the ecosystem services provided by Morro Bay's tidal marshes, including flood protection.

Healthy Ecosystems: Restoring Habitat and Hydrology in Los Osos Wetlands (FY23-24)

In 2023, the MBNEP collaborated with the Coastal San Luis Resource Conservation District (CSLRCD) to support the acquisition and restoration of a 65-acre site along Warden Creek. Historical land use practices caused significant habitat degradation, reducing the natural freshwater wetlands and coastal scrub habitat.

The restoration plan focused on reestablishing natural hydrological processes and improving habitat conditions, with a goal of restoring 50 acres of freshwater wetland and 15 acres of coastal scrub habitat. The MBNEP staff played a key stakeholder role, providing technical assistance throughout the planning, permitting, and implementation phases. The wetland restoration improves water quality, enhances biodiversity, and strengthens the landscape's ability to absorb and mitigate the effects of extreme weather events, such as flooding and drought conditions.

This project serves as a successful example of collaboration driving ecological recovery. The restored wetlands now support a diverse array of native plants and wildlife, reinforcing the health and long-term resilience of the Morro Bay estuary and watershed.

Healthy Ecosystems: Comprehensive Project Table

Project	Key Activities	Short-Term Outcomes	Long-Term Outcomes	Accomplishments & Deliverables	Lessons Learned	Funding and Partnerships	Alignment with CCMP Action Plans
Eelgrass Restoration & Research	Transplanted healthy eelgrass specimens at various bay locations (FY20-22) Monitored water quality, hydrology, and eelgrass health (FY20-24) Researched drivers of eelgrass decline and recovery (FY20-24)	Preservation of remnant eelgrass beds 83% of restoration sites showed increased growth Development of optimal transplant methods Established long-term monitoring sites to track critical metrics Expanded technical knowledge of eelgrass restoration and species interactions Improved understanding of biotic and abiotic factors influencing eelgrass health	Eelgrass recovery to over 700 acres in 2023, surpassing historic levels Improved habitat resilience and water quality for wildlife and people Enhanced biodiversity in the estuary Strengthened long-term eelgrass monitoring and adaptive management Enhanced understanding of eelgrass ecosystem dynamics Contributed to regional and national seagrass research	Increased eelgrass extent from 13 acres (2017) to 700 acres (2023) Developed transferable restoration techniques for timing, site selection, and anchoring methods Advanced understanding of eelgrass variability Furthered understanding of prokaryote communities, slime mold and wasting disease, crab interactions, and Black Brant grazing impacts	Timing, depth, and site conditions are critical for transplant success Sedimentation and erosion significantly impact eelgrass Disease and environmental stressors must be considered in long-term eelgrass management Partnerships with academic institutions enhance research capacity and data collection Pilot scale restoration techniques identified to scale up to larger restoration efforts	Partners: Cal Poly, USFWS, CDFW, Restore America's Estuaries, NOAA, Cuesta College, ACOE, City of Morro Bay Funding Sources: 320, IIJA, USFWS, CDFW, private donations	LP-1 Special Habitats ECR-5 Sediment Traps ECR-6 Eelgrass Restoration ECR-6 Hydrology and Bathymetry ECR-7 Eelgrass Data and Research ECR-8 Eelgrass Research ECR-9 Regional and National Collaboration ECR-11 Conserve Ecosystem Function
Riparian and Floodplain Enhancement	Chorro Creek Ecological Reserve Restoration: Restoration of 4.8 acres of floodplain and 4,280 linear feet of creek by expanding a levee breach, grading secondary channels,	Increased floodplain connectivity, sediment retention, and hydrological function	Enhanced watershed resilience to extreme weather events	Restored riparian, wetland, and floodplain functions across multiple sites (645 acres)	Adaptive management is critical for resilience in changing environmental conditions	Partners: CDFW, CSLRCD, NRCS, NOAA Fisheries, local landowners, USFWS, SCC, WCB, CCC,	LP-1 Protect Special Habitats/Species BMP-1 Agricultural and Grazing BMPs BMP-2 Rural Roads Erosion

Project	Key Activities	Short-Term Outcomes	Long-Term Outcomes	Accomplishments & Deliverables	Lessons Learned	Funding and Partnerships	Alignment with CCMP Action Plans
	installing large wood structures, planting riparian vegetation, and stabilizing a creek road crossing within a 580-acre reserve (FY19-20) Los Osos Creek Wetlands Restoration: Acquisition and restoration of 65 acres, including 50 acres of freshwater wetlands and 15 acres of coastal scrub habitat with hydrological improvements and community engagement (FY23) Pennington Creek Fish Passage Restoration: Removal of a fish passage barrier, restoring 78 feet of stream to improve steelhead migration (FY19-24) San Luisito Creek Fish Passage Planning: Feasibility studies and planning for barrier removal and stream habitat restoration (FY23-24) Walter's Creek Riparian Restoration Planning: Planning for low-tech, process based riparian restoration techniques (FY24) Los Osos Creek Ranch Restoration: Streambank	Improved wetland and riparian habitat for native species Restored steelhead migration pathways (Pennington Creek) Advanced planning and feasibility for San Luisito Creek and Walter's Creek restoration	Strengthened habitat connectivity and biodiversity Developed regional restoration models for similar ecosystems Implementation of future restoration projects based on planning efforts	Improved fish passage (Pennington Creek) and hydrological connectivity Conducted planning and feasibility studies for future restoration projects	Collaborative approaches improve restoration success and ensure long-term sustainability Planning and feasibility studies are essential for securing future implementation funding	MCAS, SLO County Funding: CDFW, CA Coastal Conservancy, NOAA, USFWS, SCC, WCB, private conservation grants	ECR-1 In-Stream Habitat ECR-3 Wetlands Protection and Enhancement ECR-4 Wetlands Habitat Assessment ECR-5 Sediment Traps ECR-11 Conserve Ecosystem Functions ECR-15 Steelhead Barriers and Habitat

Project	Key Activities	Short-Term Outcomes	Long-Term Outcomes	Accomplishments & Deliverables	Lessons Learned	Funding and Partnerships	Alignment with CCMP Action Plans
	enhancement project on 367 feet of creek within a 540-acre ranch to reduce erosion and improve riparian habitat (FY19)						
Steelhead Habitat Restoration	Reduction of invasive Sacramento pikeminnow population through targeted electrofishing (FY19-24) PIT tagging and spawner surveys to monitor steelhead movement (FY23-24) eDNA sampling to assess steelhead presence above and below migration barriers (FY24)	Reduced population of invasive Sacramento pikeminnow Improved conditions for steelhead Increased understanding of steelhead migration patterns within the watershed	Sustained recovery of steelhead populations in the Morro Bay watershed Greater ecosystem resilience and restored aquatic habitat Developed transferable techniques for invasive species management in Central Coast streams	Reduction of invasive species and improved habitat quality for native steelhead Implementation of steelhead restoration plan Data collection on PIT tagging, spawner surveys, and eDNA for integration into CDFW Passage Assessment Database	Effectiveness of electrofishing techniques in managing invasive species Importance of integrating advanced monitoring tools like eDNA to track species presence and movement	Partners: CDFW, CCC Funding Sources: CDFW, IIJA, 320	LP-1 Protect Special Habitats/Species ECR-1 In-stream Habitat ECR-13 Population Dynamics ECR-14 Support Recovery Plans ECR-15 Steelhead Barriers and Habitat ECR-16 Invasive Species Action Plan
Invasive Species Management	Drone surveys and field mapping of invasive species in Chorro Creek, prioritizing identification of Giant Reed (Arundo) to implement management (FY24) Management of iceplant on the sand spit dune habitat (FY23-24) Management of non-native California sea lavender in the estuary (FY22-24) Implementation of invasive species management at Camp SLO (FY23-24)	Invasive species mapping data to inform management Treated and restored140 acres of dunes on the sand spit Improved native vegetation recovery Developed and implemented mapping and monitoring protocols	Reduced invasive species spread Reduced long-term habitat degradation Strengthened dune, riparian, and upland ecosystem resilience	Treated 33 acres of invasive iceplant dominated habitat on sand spit Restored 140 acres of coastal dune habitat on the sand spit Removed 40 acres of invasive species at Camp SLO Compiled mapping data and results for invasive species in Chorro Creek	Invasive species require long-term monitoring and retreatment Partnerships are essential for large-scale removal efforts Effective removal enhances native plant restoration Permitting requirements and multiple overlapping jurisdictions or private landowner	Partners: SLO County, California State Parks, Camp SLO, CSLRCD, city of Morro Bay, USFWS, SCC, UCSB, CDFW, private landowners Funders: IIJA, USFWS	ECR-1 In-stream Habitat ECR-3 Wetlands Protection and Enhancement ECR-4 Wetlands Habitat Assessment ECR-9 Regional and National Collaboration ECR-16 Invasive Species Action Plan

Project	Key Activities	Short-Term Outcomes	Long-Term Outcomes	Accomplishments & Deliverables	Lessons Learned	Funding and Partnerships	Alignment with CCMP Action Plans
	Morro Dunes Restoration Project - iceplant removal and coastal dune restoration led by State Parks (FY19-FY24)				access may be challenging		
Conservation Easements & Land Protection	Ranch Conservation Easement in Los Osos Valley (FY19) Chorro Watershed Conservation Easement (FY22) Maino Conservation Easement Monitoring (FY19-24) Sweet Springs Land Acquisition (FY23)	Protected 929 acres of agricultural, riparian, upland, and coastal habitat Improved habitat connectivity and watershed resilience Strengthened landowner engagement and stewardship	Ensured permanent conservation of priority lands for habitats, water quality, and resilience Increased ecological connectivity and species protection	Ranch Conservation Easement: 540-acres of grasslands, riparian corridors, and habitat for species such as the bald eagle and California red-legged frog Chorro Watershed Easement: 389 acres of working lands, oak woodlands, coastal sage scrub, and riparian corridors Maino Conservation Easement: Ongoing monitoring ensures compliance with conservation protections Sweet Springs Land Acquisition: Expanded protected wetland and upland habitat by adding 0.72 acres of willow thicket and coast live oak woodland	Strategic land conservation prevents irreversible habitat loss Long-term monitoring and landowner engagement ensure compliance and adaptive management Partnerships and diverse funding sources are key to expanding conservation efforts	Partners: LCSLO,MCAS, private landowners, local conservation groups, SCC Funders: State and private conservation grants, Army Compatible Use Buffer Program, Consent Decree	LP-1 Protect Special Habitats/Species LP-3 Direct Urban Development MON-3 Monitor Project Effectiveness MON-5 Support Partners BMP-1 Agricultural and Grazing BMPs BMP-5 BMPs by Private Landowners and Municipalities ECR-3 Wetlands Protection and Enhancement ECR-4 Wetlands Habitat Assessment ECR-11 Conserve Ecosystem Functions ECR-12 Upland Habitats
Best Management Practices	Cuesta College Sustainable Agriculture (FY24) Erosion Control on Rural Road (FY19, 23)	Installed and improved BMPs to protect soil, water quality, and habitat Repaired rural roads and stream banks to	Increased watershed resilience by reducing erosion and improving rangeland management	Supported the Cuesta College Sustainable Agriculture Program by installing 5,400 linear feet of fencing on 35 acres for improved	Infrastructure BMPs require ongoing maintenance to ensure long-term effectiveness	Partners: Cuesta College, CSLRCD, private landowners, Cal Poly, PGE, Camp SLO, NRCS,	LP-1 Protect Special Habitats/Species BMP-1 Agricultural and Grazing BMPs BMP-2 Rural Roads Erosion

Project	Key Activities	Short-Term Outcomes	Long-Term Outcomes	Accomplishments & Deliverables	Lessons Learned	Funding and Partnerships	Alignment with CCMP Action Plans
	Rangeland Improvement (FY23) Implement BMPs to reduce nutrient pollution (FY19) Creek bank stabilization (FY19) Riparian fencing installation (FY23-24)	reduce erosion to the creeks and bay Reduced sedimentation and unmanaged runoff into tributaries Fencing to better manage cattle and protect sensitive riparian habitat Reduced loading of nutrients, sediment, and bacteria to creeks and the bay	Strengthened landowner engagement in sustainable practices Improved habitat in the creeks for sensitive species such as steelhead Reduced sediment transport to the bay, protecting sensitive habitats like eelgrass	grazing management and wildfire resilience Implemented emergency erosion control after large winter storms in early 2023 to stabilize a road (550 linear feet) washout near a tributary to San Luisito Creek, preventing a major source of sediment Installed fencing to allow for managed grazing across 495 acres of rangeland, improving soil health and reducing erosion 21,000 linear feet of riparian fencing installed on private property	Early intervention in erosion-prone areas prevents costly long-term damage Collaboration with landowners, local stakeholders, and educational institutions expands BMP opportunities Diverse partnerships, including educational ones, can have big impacts to this issue	CCRWQCB, SLO County Funding: SWRCB 319(h), NRCS, 320, IIJA	BMP-5 BMPs by Private Landowners and Municipalities ECR-2 Hydrology and Sediment Transport ECR-9 Regional and National Collaboration
Fish & Wildlife Monitoring for Adaptive Management	Updated Fish Species Baseline (FY23-24): Conducted fish surveys to assess species trends following eelgrass habitat changes Support Oyster Aquaculture in Morro Bay (FY22): Monitored native Olympia oysters to assess survival, growth, and habitat conditions	Established baseline datasets for fish populations, shellfish aquaculture, and wildlife movement Identified priority conservation areas for future habitat restoration and species management Provided data to guide adaptive management strategies.	Strengthened long-term monitoring programs to track species trends and habitat shifts. Informed habitat restoration, species conservation, and sustainable aquaculture management.	Completed fish population surveys, documenting species distribution and abundance following eelgrass habitat shifts Conducted three Olympia oyster surveys, confirming the species' presence and identifying suitable habitat conditions	Long-term monitoring is essential for tracking species recovery and habitat shifts Partnerships with researchers and landowners expand data collection and conservation impact Adaptive management requires consistent, high-quality monitoring data to	Partners: Cal Poly, TNC, CDPH, oyster farms Funding: USFWS, IIJA, 320, research grants	LP-1 Protect Special Habitats/Species ECR-1 In-stream Habitat ECR-12 Upland Habitats ECR-13 Population Dynamics ECR-14 Support Recovery Plans MON-5 Support Partners MON-6 Support Research Activities USE-2 Shellfish Farming

Project	Key Activities	Short-Term Outcomes	Long-Term Outcomes	Accomplishments & Deliverables	Lessons Learned	Funding and Partnerships	Alignment with CCMP Action Plans
					inform decision-making		
Open Space and Community Habitat Enhancement	Established and restored pollinator habitat on public and private lands to support monarch butterfly recover and other pollinators (FY22)	Increased pollinator habitat through strategic planting efforts Engaged community volunteers in habitat restoration Improved monarch butterfly habitat in priority areas	Strengthened long-term pollinator habitat resilience Increased native plant cover in restoration areas Enhanced awareness of pollinator conservation	Partnered with an organic farmer to develop habitat enhancement plans, secure funding, install irrigation, and coordinate a volunteer planting day Restored 0.25 acres of monarch and pollinator habitat at Sweet Springs, installed educational signage, and engaged volunteers in restoration efforts	Community engagement is key to the success of pollinator habitat projects Native plant selection and irrigation planning are critical for long-term restoration success Collaboration between conservation groups and landowners enhances restoration impact	Partners: CSLRCD, MCAS, private landowners Funding: IIJA, 320, Consent Decree, grants	LP-1 Protect Special Habitats/Species) ECR-3 Wetlands Protection and Enhancement ECR-12 Upland Habitats EO-1 Public Education and Outreach
Research & Planning	Historical Ecology Study: Documented pre-development landscape conditions to inform restoration planning (FY23-24) Habitat Restoration and Protection Strategy: Developed a watershed-wide approach to habitat restoration and resilience and tracking (FY20-24) California Coastal Dune Study: Assessed the role of dunes in habitat stability and restoration planning (FY23-24)	Provided baseline data to guide management and restoration planning Identified key resilience thresholds for marsh, dune, and estuarine habitats Created a foundation for informed conservation actions and adaptive management	Strengthened long-term monitoring and research programs Ensured that science-based strategies inform regional planning efforts Improved understanding of habitat changes and environmental drivers	Compiled historical maps, records, and photos to establish a baseline of Morro Bay's ecological conditions Developed a comprehensive habitat strategy to prioritize restoration and protection Produced a coastal dune synthesis report to support statewide dune restoration planning Conducted long-term saltmarsh monitoring,	Long-term data collection is critical for understanding habitat trends and informing restoration Historical ecology provides valuable context for conservation planning Collaborative research strengthens regional conservation strategies	Partners: SFEI, UCSB, USGS, CSLRCD, conservation scientists Funding: IIJA, 320, research grants	LP-1 Protect Special Habitats/Species ECR-3 Wetlands Protection and Enhancement ECR-4 Wetlands Habitat Assessment ECR-9 Regional and National Collaboration ECR-11 Conserve Ecosystem Functions ECR-12 Upland Habitats MON-2 Monitor Environmental Indicators MON-6 Support Research Activities

Project	Key Activities	Short-Term Outcomes	Long-Term Outcomes	Accomplishments & Deliverables	Lessons Learned	Funding and Partnerships	Alignment with CCMP Action Plans
	Saltmarsh Habitat Monitoring: Tracked marsh elevation changes and sediment deposition to assess habitat sustainability (FY23-24)			tracking habitat shifts and sedimentation trend			

Clean Water:

Clean Water: Introduction

Protecting and improving water quality in Morro Bay and its watershed is critical to maintaining habitat health, recreational opportunities, and local economies. The MBNEP works to reduce pollutants, track environmental trends, and implement BMPs that safeguard clean water for the community and wildlife. Through scientific monitoring, pollution reduction strategies, and collaborative partnerships, the MBNEP addresses key water quality challenges and strengthens long-term watershed resilience.

Water quality concerns in the watershed stem from stormwater runoff, agricultural activities, bacteria contamination, sedimentation, and changing hydrological conditions. To address these challenges, the MBNEP focuses on long-term monitoring, pollution reduction, and targeted management actions. The VMP has been a cornerstone of these efforts, with community members assisting in data collection to inform restoration and regulatory decisions.

The MBNEP's Clean Water initiatives include:

- **Bacteria and TMDL Implementation** – Monitoring bacteria levels in local creeks and the bay to inform public health, shellfish farming, and regulatory decisions, while initiatives like Mutts for the Bay help prevent bacteria pollution
- **Freshwater Flows and Surface Water Protection** – Tracking streamflow conditions to ensure adequate water availability for steelhead trout and other aquatic species while balancing human water needs
- **Stormwater Management and Pollution Reduction** – Partnering with State Parks, the Ocean Protection Council (OPC), and local stakeholders to install bioswales and sediment basins that filter pollutants before they reach the bay
- **Nutrient and Harmful Algal Bloom (HAB) Research** – Monitoring nutrient pollution and phytoplankton dynamics to prevent water quality degradation and improve shellfish farm management
- **Sediment Total Maximum Daily Load (TMDL) and Erosion Control** – Implementing rural road repairs, streambank stabilization, and riparian fencing to reduce sedimentation and protect aquatic habitats
- **Plastic and Litter Reduction** – Conducting microplastic research and beach cleanups to reduce marine debris and raise public awareness
- **Groundwater Protection and Drinking Water Security** – Installing monitoring wells in Los Osos to track saltwater intrusion and safeguard long-term drinking water supplies

Clean Water: Project Highlights

Collecting High Quality Data to Support Management (FY 19-24)
A primary goal of the National Estuary Programs (NEP) is to assess the trends in water quality, natural resources, and uses of the estuary through monitoring. The MBNEP maintains a robust monitoring

program that tracks water quality, water quantity, habitat quality, and other areas to assess long-term ambient trends throughout the estuary and watershed.

A core part of the monitoring efforts are supported by the program's VMP, where community volunteers are trained to collect high quality data per the program's EPA-approved QAPP.

The data collected by staff and volunteers undergoes quality assurance procedures to ensure accuracy, replicability, and other data quality objectives. Staff submit the data to the California Environmental Data Exchange Network (CEDEN), a State Water Resources Control Board (SWRCB)-managed data portal which makes data widely accessible. This data is utilized by SWRCB staff and others to support monitoring, assessment, and research. The Central Coast Regional Water Quality Control Board (CCRWQCB) uses the data for their Integrated Report process and assessment of TMDL implementation, 303(d) status of local waterbodies, and other assessments.

The data also supports restoration and management efforts by identifying problems areas or high quality habitat that would benefit from implementation efforts such as water conservation projects, fish passage barrier removal, and BMPs to address agriculturally-impacted waters. The data also supports monitoring to determine the effectiveness of various management actions, including creek surface flows following construction of a water diversion control to keep more water in a local steelhead-bearing stream, nitrate levels in shallow groundwater following the Los Osos Water Reclamation Facility coming online, and other efforts.

The Monitoring Program works closely with partners like SWRCB, CCRWQCB, California Department of Public Health (CDPH), CSLRCD, EPA, San Luis Obispo (SLO) County, local shellfish farmers, and private and public landowners to share data and trends. This information supports resource management such as regulating shellfish growing areas, assessing the effectiveness of BMPs, and understanding the impacts of large-scale restoration efforts such as floodplain restoration.

Bacteria TMDL Implementation (FY 19-24)

Clean water is crucial to many of the activities taking place in the bay. The MBNEP works to protect water quality to safeguard the beneficial uses of recreation and shellfish farming. The program has been monitoring indicator bacteria monthly since 2005, resulting in a long-running data set to support TMDL assessment. The work has been done in conjunction with partners such as Cuesta College and the city of Morro Bay, both of whom shared lab space with the program. The data undergoes quality assurance protocols to validate its usability and is shared in the state's CEDEN portal. This ensures that the data can be utilized by the state for TMDL, 303(d), and other water quality assessments. The MBNEP conducts the only ongoing in-bay monitoring effort.

The MBNEP also supports efforts by the CDPH and local shellfish farmers to collect data to better manage growing areas. The program shares its bacteria data with these partners and provided supplemental funding in FY24 to support expanded monitoring in growing areas to better understand stormwater impacts. This information helps guide management of shellfish growing areas and would not be possible without the funding provided by the MBNEP.

The MBNEP works to protect water quality and to spread educational messaging to encourage specific behaviors to help keep our waters clean. A major initiative is the Mutts for the Bay program that provides free pet waste bags to residents and visitors. With the help of community sponsors, private

foundation support, and volunteers, the MBNEP manages 36 pet waste bag dispensers in Morro Bay and Los Osos. The cost of the dispensers and bags is supported by grants, community donations, and sponsorships. By providing free pet waste bags at convenient locations, these dispensers prevent an average of 40 tons per year of dog waste from potentially contaminating the estuary. The program gives out an average of 330,000 bags per year. In FY22, the program goals broadened to include eco-friendly dog ownership education. Staff developed and distributes an eco-friendly dog owner brochure and activity book, publishes a quarterly blogs on related topics, and tables at events to educate the public on ways they can keep the watershed clean and healthy.

Partners for these efforts include Cuesta College, CCRWQCB, SWRCB, CDPH, local shellfish farms, the Harold J. Miossi Charitable Trust (funder of Mutts program), City of Morro Bay, County of San Luis Obispo (SLO), the volunteers who provide support, and private and public landowners who allow access.

Stormwater Management to Protect Water Quality (FY 19-24)

In coastal areas such as Morro Bay, human infrastructure like parking lots and roads are often at the water's edge, and runoff can directly impact nearby waterways. While seemingly harmless, this runoff can contain fuel, nutrients, heavy metals, sediment, and bacteria that can harm water quality. Samples of stormwater runoff from the State Park Marina's nearly 70,000-square-foot parking lot indicated the presence of these harmful pollutants at concentrations above the level of concern. The MBNEP worked with State Parks, the OPC, the California Marine Sanctuary Foundation, and other partners to install bioswales and a sediment settling basin to reduce contaminants before the water reaches the bay. Initial post-project monitoring indicated that these treatment systems successfully reduced fuel, sediment, and heavy metals in the stormwater runoff.

A major landowner in the watershed is the Camp San Luis Obispo Army National Guard Base (Camp SLO). Chorro Creek runs through Camp SLO property and provides habitat for sensitive aquatic species like steelhead. Runoff from parking lots and roads went directly, untreated, into Chorro Creek. The CSLRCD, with funding support from the MBNEP, developed and implemented a project that included bioswales, instream structures, and native plantings. These projects stabilized failing stormwater management infrastructure to reduce the velocity and contaminant levels in the runoff that makes its way to nearby Chorro Creek.

Protecting Groundwater for the Community (FY23-24)

Reliable and safe drinking water is an issue for communities throughout the West. Frequent drought, dwindling groundwater supplies, and growing populations all put a strain on a limited resource. The community of Los Osos primarily depends on groundwater for its water supply. Water withdrawals are increasing saltwater intrusion into the lower aquifer. To halt this threat to the aquifer, supply wells have been shifted to the east, away from the coast. The MBNEP partnered with the Los Osos Community Services District (LOCSD) in FY24 to install a new monitoring well to better assess saltwater intrusion in the aquifer. The data it provides supports all purveyors in the community and their efforts to provide safe drinking water. The next phase of the project involves the rehabilitation of two existing monitoring wells to further support groundwater management efforts. Partners included the LOCSD, the Los Osos Basin Management Committee (LOBMC), S&T Municipal Water, and Golden State Water.

Clean Waters: Comprehensive Project Table

Project	Key Activities	Short-Term Outcomes	Long-Term Outcomes	Accomplishments & Deliverables	Lessons Learned	Funding and Partnerships	Alignment with CCMP Action Plans
Bacteria and TMDL Implementation	Monitoring creek and bay bacteria indicators (FY19-24) Partner with CDPH on bacteria indicator monitoring to improve shellfish growing area management (FY24) Manage pet waste bag dispenser network to prevent bay bacteria contamination (FY19-24) Morro Bay Pathogen TMDL implementation support (FY19-24)	Identify unsafe conditions for swimming and shellfish farms Allow for more informed management of farms Understand bacteria sources to the bay Provide implementation and monitoring activities to support TMDL	Identify and address NPS bacteria impacts Support longevity of local shellfish farms with streamlined regulatory requirements Better-informed pet owners propagate BMPs to protect water quality Improved bay water quality	Monthly bay bac memos to managers and landowners, annual summary memo, CEDEN submittal Updated closure guidance for farm management, CEDEN submittal Bacteria prevented from reaching the bay, shared outreach messaging Monitoring data submitted to CEDEN to support 303(d), TMDL, and other assessments	Developed partnership with community college to train student volunteers Minimal funding support for an agency can have tangible impacts on management and regulations Strong community interest has supported this monitoring effort for 20 years TMDL implementation is challenging due to regulatory structure, lack of funding, etc.	Partners: SLO County, CCRWQCB, Cal Poly, LOCSD, State Parks, city of Morro Bay, commercial oyster growers, landowners, CDPH Funding: IIJA, 320	MON-1 Support TMDLs MON-2 Monitor Env Indicators MON-4 Maintain VMP MON-5 Support Partners BMP-6 Reduce Pet Waste ECR-10 Nutrient & Bacteria Dynamics USE-1 Recreational Uses USE-2 Shellfish Farming EO-2 State of the Bay
Freshwater Flows	Installing low flow sensors throughout the watershed (FY23-24) Monitoring surface flows near riparian wells impacted by Pennington Rainwater Catchment Project (FY19-24)	Track flows during spring/summer to determine if minimal flows present for steelhead Determine whether use of stored rainwater impacts surface flows	Better protected surface flows to protect sensitive aquatic life during crucial points in life cycle Collect data to drive project improvements to increase system efficiency	An expanded data set of surface flows throughout the year to guide management Data publicly available through CEDEN	Water withdrawals confound the data set and are a challenge due to little to no regulatory support	Partners: Creek Lands Conservation, SLO County, Cal Poly, private and public landowners Funding: IIJA, 320	LP-1 Protect Habitat & Species MON-2 Monitor Environmental Indicators MON-3 Monitor Project Effectiveness MON-4 Maintain VMP MON-5 Support Partners ECR-1 In-stream Habitat

Project	Key Activities	Short-Term Outcomes	Long-Term Outcomes	Accomplishments & Deliverables	Lessons Learned	Funding and Partnerships	Alignment with CCMP Action Plans
							ECR-13 Population Dynamics ECR-14 Support Recovery Plans ECR-15 Steelhead Barriers & Habitat FWR-1 Manage Freshwater Resources FWR-3 Understand Flow for Public Trust Resources
Harmful Algal Blooms	Support phytoplankton research in Morro Bay (FY22-24)	Improve understanding of Morro Bay phytoplankton population dynamics Expand understanding of sediment impacts on populations, adopt flow-through real-time sensors	Automated accurate system for real-time tracking of HABs Increased safety of shellfish for consumption	Morro Bay dataset for comparison to other areas Initial testing of real-time sensors use in Morro Bay	Time of year and location in the bay impact phytoplankton populations	Partners: Cal Poly, CDPH, commercial oyster farms Funding: Consent Decree, IIJA	MON-2 Monitor Environmental Indicators MON-4 Maintain VMP MON-5 Support Partners MON-6 Support Research ECR-9 Regional & National Collaboration ECR-10 Nutrient & Bacteria Dynamics ECR-11 Conserve Ecosystem Functions USE-2 Shellfish Farming
Volunteer Monitoring Program	Train and coordinate volunteers to support program monitoring efforts (FY19-24)	Collection of high quality data to support management	Increased stewardship Long-term data set to track changes over time	Consistent, high quality data set, available in CEDEN	With proper training and oversight, volunteers can collect high quality data and form deep connections with the watershed	Partners: Cal Poly, Cuesta College Funding: 320, IIJA, private foundations, donations	MON-1 Support TMDL Development MON-2 Monitor Environmental Indicators MON-3 Monitor Project Effectiveness

Project	Key Activities	Short-Term Outcomes	Long-Term Outcomes	Accomplishments & Deliverables	Lessons Learned	Funding and Partnerships	Alignment with CCMP Action Plans
							MON-4 Maintain VMP
Collecting High Quality Data to Support Management	Collect data utilizing SWAMP-approved methods including freshwater bioassessment (FY19-24) Update EPA-approved QAPP (FY19-24) Conduct data analysis and management, including calculation of relevant metrics (FY19-24) Share data widely through state data portal (FY19-24)	Collection of high quality data to support management, including 303(d), TMDLs, education & outreach, etc. Build monitoring partnerships with universities, agencies, and other partners	Improved water quality Increased environmental stewardship	Consistent, high quality data set, available in CEDEN Provide data for CCRWQCB data assessments, via CEDEN	Agency collaborations improve data quality and sharing	Partners: CCRWQCB, SWRCB, EPA, commercial labs, Cal Poly, Cuesta College, local municipalities, landowners Funding: 320, IIJA, private foundations, donations	MON-1 Support TMDL Development MON-2 Monitor Environmental Indicators MON-3 Monitor Project Effectiveness MON-4 Maintain VMP MON-5 Support Partners MON-6 Support Research Activities
Nutrients	Monitor agricultural-impacted waterways Monitor freshwater seeps	Track changes in nutrient levels over time Understand impacts of wastewater treatment facility outfall (NPDES permit)	Reduce negative impacts including HABs, bay closures for shellfish farms, and eelgrass loss Improved water quality in the creeks and bay	Collection of a high-quality data set to support assessment and management (i.e., 303(3), TMDLs, management of shellfish growing waters, etc.)	Nutrient impacts on shallow groundwater are long-lasting, even after the source has been eliminated Wastewater discharge can have large impacts on water quality, in particular nitrates and water temperature	Partners: CSLRCD, CCRWQCB, private landowners, SLO County Funding: 320, IIJA	MON-1 Support TMDL Development MON-2 Monitor Environmental Indicators MON-3 Monitor Project Effectiveness MON-4 Maintain VMP MON-5 Support Partners BMP-1 Ag & Grazing BMPs BMP-11 CMC Wastewater
Tracking Bay Water Quality	Purchase and support continuous water quality censors for the CeNCOOS network	High quality continuous dataset available in real-time	Better understanding of bay water quality conditions could improve	Real-time high-quality dataset supports monitoring, research, and	Improved water quality data allows for tracking of conditions that potentially impact	Partners: Cal Poly, NOAA, CeNCOOS Funding: 320, IIJA	MON-1 Support TMDL Development

Project	Key Activities	Short-Term Outcomes	Long-Term Outcomes	Accomplishments & Deliverables	Lessons Learned	Funding and Partnerships	Alignment with CCMP Action Plans
	Nutrient and carbonate chemistry monitoring of bay waters	Improved understanding of bay analytes and changes over time	management of shellfish farms, eelgrass restoration efforts, and other projects to protect and restore bay habitats	management efforts in Morro Bay T-pier site: https://www.cencoos.org/morro-pier-oyster-dashboard/ Back bay site: https://www.cencoos.org/morro-bs-oyster-dashboard/	sensitive habitats like eelgrass. Before the last eelgrass decline, almost no bay water quality data was available.		MON-2 Monitor Environmental Indicators MON-3 Monitor Project Effectiveness MON-4 Maintain VMP MON-5 Support Partners MON-6 Support Research
Plastics/Litter	Microplastics research in the bay (FY21) Beach clean-ups to reduce marine debris (FY19-24) Education to reduce marine debris (FY19-24)	Improved understanding of types and locations of microplastic accumulation in the bay Increased understanding of the importance of reducing litter	Reduced marine debris and microplastics in the marine environment Improved habitat health	Research project which found minimal microplastic contamination in the estuary Established on-going beach clean-up events Developed curriculum and materials for use in schools and with the public Nature Center educational content on plastics and marine debris	Partnerships with local researchers resulted in the first microplastics research in the area, emphasizing the importance of local partnerships	Partners: Cal Poly, city of Morro Bay Funding: 320, IIJA, Consent Decree	MON-2 Monitor Environmental Indicators MON-4 Maintain VMP MON-5 Support Partners MON-6 Support Research EO-1 Public Education & Outreach EO-3 Nature Center EO-4 Formal Education Programs
Protecting Drinking Water	Install drinking water monitoring well for local community services district (FY24)	Increased ability to monitor groundwater to better manage drinking water supply	Safeguard community's long-term drinking water supply by reducing saltwater intrusion into the aquifer	Installation of a monitoring well Project planning for rehabilitation of two existing monitoring wells Annual groundwater monitoring reports created by SLO County	A well-established partner who is strongly integrated into the community was essential to project success	Partnerships: LOCSD, SLO County Basin Management Committee Funding: 320, IIJA	FWR-1 Manage Freshwater Resources FWR-6 Groundwater Recharge

Project	Key Activities	Short-Term Outcomes	Long-Term Outcomes	Accomplishments & Deliverables	Lessons Learned	Funding and Partnerships	Alignment with CCMP Action Plans
Stormwater Management to Protect Water Quality	Obtain funding and manage project to install bioswales and a sediment settling basin at a bayside State Park facility (FY18-23) Engage stakeholders on planning, data collection, and project prioritization for stormwater management projects (FY23-24)	Reduce runoff and pollution to the estuary from a large, paved parking lot Assist a partner and major landowner in the watershed in planning and development of stormwater management projects	Reduce negative impacts of runoff on nearby eelgrass, shellfish farms, recreational areas, etc. Implementation of additional stormwater management to improve water quality in nearby Chorro Creek and Morro Bay	Completion of stormwater BMPS. Improvements to water quality and protection of beneficial uses of the bay (SHELL, REC, COLD, etc.) Installation of stormwater BMPs that reduced runoff to nearby steelhead-bearing stream that drains to the estuary	Partner organizational bureaucracy can be challenging in project implementation	Partners: California Marine Sanctuary Foundation, State Parks, OPC, Camp SLO, CSLRCD Funding: OPC, SWRCB 319(h), 320, IIJA	MON-3 Monitor Project Effectiveness BMP-7 Support Stormwater BMPs ECR-1 In-stream Habitat ECR-5 Sediment Traps
Tracking Watershed Toxicity	Conduct sediment and water toxicity monitoring to better understand bioassessment scores and creek health (FY24) Work to develop a pesticide monitoring effort (FY24)	Determine locations with negative impacts on aquatic biota	Implement actions to address inputs Reduce toxicity in the watershed Improved habitat quality for sensitive species like steelhead	Monitoring data set available via CEDEN Updated QAPP documenting monitoring effort	Initial data showing the unexpected result that toxicity highest in areas that are more minimally impacted by runoff	Partners: CCRWQCB, UC Davis Granite Canyon Labs Funding: 320, IIJA	MON-1 Support TMDL Development MON-2 Monitor Environmental Indicators MON-3 Monitor Project Effectiveness MON-5 Support Partners MON-6 Support Research
Protecting Surface Flows	Conduct monitoring to track changes in surface flows following removal of a fish passage barrier and installation of a diversion control (FY19-24)	Protected surface flows for steelhead Opened up access to over 3 stream miles for sensitive aquatic species	Strengthen the Morro Bay watershed steelhead population by opening up access to high quality habitat	Collect a high-quality dataset of surface flows at the project site Create data to support responsible management of water diversion control	Multi-year data collection is necessary due to variability like drought and water withdrawals	Partners: SLO County Office of Education, Trout Unlimited, CCC Funding: NOAA, SLO County	LP-1 Protect Special Habitats/Species MON-3 Monitor Project Effectiveness ECR-1 In-stream Habitat ECR-11 Conserve Ecosystem Function

Project	Key Activities	Short-Term Outcomes	Long-Term Outcomes	Accomplishments & Deliverables	Lessons Learned	Funding and Partnerships	Alignment with CCMP Action Plans
							ECR-13 Population Dynamics ECR-14 Support Recovery Plans ECR-15 Steelhead Barriers and Habitat, FWR-1 Manage Freshwater Resources

Strong Communities:

Strong Communities: Introduction

The MBNEP engages the community in environmental stewardship, education, and outreach to strengthen connections to the estuary and watershed. Through volunteer programs, hands-on learning, and partnerships with schools and local organizations, the MBNEP ensures that people of all ages have opportunities to participate in conservation efforts.

Key initiatives include:

- Education & Outreach – Hosting college lectures, K-12 field trips, teacher trainings, and guided hikes to promote environmental literacy
- Community Engagement – Organizing coastal and creek cleanups, community science programs, and stewardship events to encourage public participation
- Public Access & Interpretation – Improving exhibits at the MBNEP Nature Center, developing interactive educational materials, and expanding outreach through digital platforms
- Youth & Volunteer Programs – Mentoring students, coordinating monitoring and community volunteers, and supporting hands-on community conservation efforts

Strong Communities: Project Highlights

Enhancing Digital Presence (FY19-24)

In an increasingly digital world, the MBNEP continues to expand its online presence and outreach efforts to effectively communicate its work, engage the community, and make environmental data more accessible. Through regular website updates, social media growth, and public presentations, the MBNEP ensures that key projects, monitoring efforts, and conservation initiatives reach a broad and diverse audience.

A major focus has been maintaining and enhancing the MBNEP website, which serves as the central hub for sharing research findings, tracking CCMP progress, and providing educational resources. Staff continuously update pages with new project information, refreshed imagery, and interactive tools that allow the public to explore the estuary's health. One of the most significant additions is the public-facing CCMP tracker, which showcases progress on conservation actions and provides transparency on how MBNEP is meeting its long-term goals. Since website visitor tracking began in FY22, the MBNEP has recorded over 169,000 visits, demonstrating strong public engagement with digital resources.

Social media continues to be an effective way to share estuary updates, science, and conservation messages. Over the past four years, the MBNEP has seen consistent growth across platforms, with notable increases in Instagram followers (from 2,078 in FY20 to 3,580 in FY24) and Facebook followers (from 2,285 in FY20 to 2,664 in FY24). LinkedIn engagement has also expanded, increasing from 197 in FY22 to 395 in FY24. This growth reflects the MBNEP's ability to translate complex environmental topics into accessible and engaging content, reaching both local audiences and a wider network of conservation professionals.

Another key component of the MBNEP's outreach efforts is public speaking and educational presentations. Staff regularly present on topics ranging from estuary science to restoration projects,

reaching a broad audience of students, community members, and conservation professionals. Since FY20, the MBNEP staff have delivered over 63 presentations, engaging more than 3,500 attendees. These talks provide opportunities to connect with the community, inspire stewardship, and share critical information about the health of Morro Bay.

In addition to digital outreach, the MBNEP's Nature Center remains a vital community space, attracting thousands of visitors annually. Despite COVID-related closures in FY20 and FY21, visitation has rebounded significantly, with over 55,000 visitors recorded between FY20 and FY24. This space serves as an entry point for locals and tourists to learn about estuarine conservation through interactive exhibits and hands-on learning experiences.

Strong Communities: Expanding Environmental Education and Field-based Learning (FY19-24)
The MBNEP has expanded its commitment to environmental education through partnerships with local and regional organizations, engaging students and educators in hands-on learning experiences centered around the Morro Bay watershed. These efforts provide opportunities for students to explore estuarine science, watershed ecology, and conservation while fostering a deeper connection to their natural environment.

A key component of this work has been the MBNEP's formal partnership with Camp Ocean Pines, an outdoor education center in nearby Cambria. Each year, Camp Ocean Pines hosts school groups from September through May and summer camps from June through August, engaging students—many from California's Central Valley—in immersive environmental education programs. This collaboration enhances the curriculum with estuary-based content, helping students understand the vital connections between their inland communities and the Morro Bay watershed.

During the summer of 2024, the MBNEP partnered with Creek Lands Conservation to support a free bilingual summer camp for youth from Guadalupe and Santa Maria. These students, ranging in age from 11 to 13, explored environmental stewardship, watershed science, and species identification while participating in outdoor activities. Each week, campers kayaked through the Morro Bay estuary before meeting with Estuary Program staff for nature journaling in Morro Bay State Park. As most of these youth live in Spanish-speaking communities, the program provided an inclusive and accessible way to engage diverse audiences in coastal conservation.

In addition to long-standing partnerships, the MBNEP reintroduced field trips in spring 2023, welcoming student groups back for in-person learning experiences. One notable collaboration was with the California Health Collaborative's Explore the Coast grant, which brought youth from the Fresno area to Morro Bay. These students not only learned about estuary, watershed, and coastal ecosystems but also received career guidance on opportunities in the environmental field. In the 2023–2024 school year, the MBNEP began hosting monthly field trips for the Estuary Explorers Club from Heartland Charter School, serving students from inland counties.

Through these educational initiatives, the MBNEP is building the next generation of environmental stewards by fostering curiosity, scientific literacy, and a sense of place. These programs are designed to be adaptable and scalable, ensuring long-term benefits for students, educators, and the broader community.

Teacher Trainings/Educator Workshops (FY23-24)

In FY23, staff organized three teacher training/educator workshops to provide professional development and environmental literacy opportunities for Central Coast teachers. There are not many teacher trainings opportunities in the San Luis Obispo area, so these trainings met a local need. In FY23, the trainings focused on Project WET, Project WILD, and How to Teach Nature Journaling. In FY24, along with partners at Cal Poly, Creek Lands Conservation, State Parks, and Southwest Marine Educators Association, staff launched a series of three workshops with a cohort of 25 educators to learn about coastal ocean literacy, nature journaling, the Morro Bay estuary, and stewardship. Using this model, staff launched a second similar series in FY25 that has a stronger focus on the Morro Bay watershed and the estuary as a case study for teaching their students.

Strong Communities: Enhancing Visitor Experiences at the Nature Center (FY23-24)

The MBNEP has revitalized the Nature Center, transforming it into a more engaging and educational space for visitors of all ages. Through interactive exhibits, updated displays, and expanded programming, the Nature Center now offers a dynamic experience that connects the public with the estuary's unique ecosystems.

A major highlight of these improvements was the installation of two new interactive exhibits in FY23. The Augmented Reality Topographic Sandbox allows visitors to shape landscapes and watch how water flows through the watershed, providing a hands-on way to explore watershed dynamics and environmental change. A Kid's Corner was added, featuring rotating activities designed to engage young learners and spark curiosity about the natural world. To further refresh the space, staff developed new artwork and branding, giving it a fresh, welcoming feel for visitors.

In addition to exhibit upgrades, the MBNEP expanded educational programming within the Nature Center. In 2023, staff hosted a story time series, bringing in partners to share engaging environmental topics with the community. Over the summer, three sessions welcomed 37 attendees and featured presentations on sea otters in Morro Bay (with Sea Otter Savvy), responsible pet ownership through the Mutts for the Bay initiative (with Woods Humane Society), and the role of beavers in watersheds (with SLO Beaver Brigade). These events provided accessible and family-friendly ways for the public to learn about conservation in a relaxed setting.

Since the start of the evaluation period, over 55,000 visitors have explored the Nature Center, making it a key hub for environmental education and community engagement. By blending hands-on learning, storytelling, and visual interpretation, the MBNEP continues to inspire visitors and cultivate a deeper appreciation for Morro Bay's natural resources.

Strong Communities: Comprehensive Project Table

Project	Key Activities	Short-Term Outcomes	Long-Term Outcomes	Accomplishments & Deliverables	Lessons Learned	Funding and Partnerships	Alignment with CCMP Action Plans
Community Engagement and Stewardship	Hosted Guided Hikes and published online hiking guides (FY19-24) Organized Coastal Cleanup, Creeks to Coast Cleanup, and Adopt a Spot Cleanups (FY19-24) Hosted Poetry Engagement (FY21) to foster artistic connections to the estuary- Relaunched Science on Tap to engage the community in environmental discussions (FY23-24)	Increased public engagement with estuary conservation Strengthened community participation in cleanups and nature-based education Fostered creative and scientific connections to conservation	Enhanced public stewardship and long-term awareness of conservation issues Established a model for engaging the public through both hands-on and creative initiatives	Thousands of pounds of trash removed through cleanup events Science on Tap series revived with multiple talks engaging residents on key estuary topics Regular guided hikes provided interactive experiences for locals and visitors Poetry competition engaged creative expression in environmental stewardship	Combining digital and in-person engagement expands reach Creative and informal events draw diverse audiences	Partners: ECOSLO, local environmental organizations, community members Funding: IIJA, 320	EO-1 Public Education & Outreach EO-4 Formal Education Programs USE-1 Recreational Uses
Digital and Programmatic Expansion	Enhanced MBNEP's digital presence through social media, blogs, and outreach materials (FY19-24)	Increased access to environmental education Broader audience engagement	Strengthened long-term engagement through digital platforms Improved communication with stakeholders and the public	Expanded website, developed new digital materials, and increased social media outreach	169,000+ website visits recorded since tracking began (FY22) 69% increase in blog subscribers from 324 (FY20) to 549 (FY24) Social media growth: Facebook (+379 followers), Instagram (+1,502 followers), LinkedIn (+198 followers) CCMP project tracker launched for public access	Partners: Local organizations and businesses Funding: IIJA, 320	EO-1 Public Education & Outreach

Project	Key Activities	Short-Term Outcomes	Long-Term Outcomes	Accomplishments & Deliverables	Lessons Learned	Funding and Partnerships	Alignment with CCMP Action Plans
Environmental Education and Outreach	Hosted K-12 Field Trips for hands-on environmental education (FY19-24) Provided college lectures on estuarine science (FY19-24) Launched Summer Science Storytime to engage young children (FY24) Developed an educational activity booklet in partnership with MB State Park and Creek Lands Conservation (FY21) Mentored undergraduate and graduate students through project-based learning (FY19-24) Conducted teacher trainings for local educators (FY22-24) Partnered with local group for 'Watershed Week" education schools around San Luis Obispo County (FY24)	Increased environmental literacy for students, educators, and families Strengthened public and academic engagement in estuary science	Cultivated long-term environmental stewardship Inspired future conservation professionals and educators	Hosted numerous student field trips and supported Watershed Week, reaching over 10,000 K-12 students Published and distributed an educational activity booklet Provided mentorship to 24 college students Trained 75 educators in estuary-related curriculum	Hands-on and experiential learning is highly effective Collaborations with educators increase program impact	Partners: Local schools, Camp Ocean Pines, Cuesta College, Cal Poly, Creek Lands Conservation, State Parks, SCC, One Cool Earth Funding: IIJA, 320	EO-1 Public Education & Outreach EO-4 Formal Education Programs USE-1 Recreational Uses MON-6 Support Research Activities
Public Spaces and Visitor Engagement	Managed the Nature Center to engage visitors (FY19-24) Assisted with Redesigning an Estuary and Eelgrass Exhibit at the Morro Bay Museum of Natural History (FY24)	Increased visitor engagement and awareness of estuarine habitats Improved interpretation of key estuary conservation topics	Strengthened public understanding of Morro Bay ecosystems Enhanced public connection to conservation efforts through interpretive spaces	55,000+ visitors since the beginning of the evaluation period Augmented Reality Sandbox & Kid's Corner exhibits installed 37 attendees participated in Storytime events	Well-designed exhibits enhance public education Hands-on learning spaces increase engagement	Funding: 320, IIJA Partners: Morro Bay State Park, Morro Bay Museum of Natural History	EO-1 Public Education & Outreach EO-3 Nature Center

Other Programmatic Accomplishments:

In addition to complying with all CWA 320 and IIJA grant requirements -- including delivery of work programs and budgets, annual audits, semi-annual reports, and National Estuary Program Online Report Tool (NEPORT) submissions (Topic 2 below) – the MBNEP accomplished other major programmatic projects during this PE period.

CCMP Update

The MBNEP undertook a major effort to update its CCMP to ensure it reflects the latest science, priorities, and challenges facing the Morro Bay estuary and watershed. The update included revisions to action plans and other key amendments to strengthen long-term conservation strategies.

The draft CCMP was updated with input from Technical Advisory Committees (TAC), the Bay Foundation, and the Executive Committee (EC). After incorporating feedback and addressing EPA recommendations, the updated CCMP was approved by EPA in 2022. The updated CCMP is available at https://www.mbnep.org/comprehensive-conservation-management-plan/.

To enhance transparency and accessibility, the MBNEP also developed a public-facing CCMP project tracker, which allows stakeholders to explore progress on key initiatives. The tracker can be viewed at https://storymaps.arcgis.com/stories/82e0f625c73640a1b73ca95b0a72a6c8.

Habitat Restoration and Protection Strategy

As part of the CCMP update, the MBNEP developed the HPRS with input from TACs. The HPRS establishes improved indicators for estuarine and freshwater habitat health and updates monitoring benchmarks to better track ecosystem conditions.

The HPRS provides a comprehensive framework for habitat conservation, incorporating upland habitats, special status species, and ongoing restoration efforts. It connects directly to CCMP action plans, ensuring that management strategies are aligned with long-term resilience goals. More information can be found at **https://www.mbnep.org/habitat-protection-restoration-strategy/**.

Triennial Report Card and "State of the Bay" 2020 and 2023

Every three years the MBNEP prepares a report card on the health of the estuary and watershed. This "State of the Bay" report addresses key questions regarding water quality and habitat health such as "Is Morro Bay safe for swimming?" and "Is water in the creeks and bay clean enough for fish and aquatic life?" This public-friendly report is distributed in hard copy and online through the program's website. Two such reports were prepared during this PE period in 2020 and 2023.

Additionally, the MBNEP promotes several related State of the Bay community events to share the results of the report card. For example, in FY23 the MBNEP held a "Science Explorations" series that presented recent estuary and watershed research in a public-assessable way; sponsored a "Get Outside" series that included an Earth Day clean-up, hikes and nature journaling; and staffed booths at popular farmers' markets in Los Osos and in San Luis Obispo, one that regularly attracts several

thousand people. The FY20 State of the Bay events were impacted by COVID, necessitating a shift from public events to remote presentations and events.

Other Regional Committees and Collaborations

The MBNEP is frequently asked to participate on and sometimes host committees and other inter-agency collaborations working on issues related to estuary, watershed and coastal concerns. During this PE period these included the following:

- California Dunes Science Network Advisory Team
- Central Coast Wetland Group (Estuary Marine Protected Areas)
- Western Society of Naturalists
- California Coastal Chapter of the Wildlife Society (Wildlife Symposium)
- San Luis Obispo Marine Protected Area Collaborative
- Pacific Marine and Estuarine Fish Habitat Partnership (Science and Data Committee)
- California Shore and Beach Preservation Association (Board)
- Vessel Pump-out Monitoring Program with Santa Monica NEP
- Elkhorn Slough National Estuarine Research Reserve collaboration regarding nutrient and pathogen TMDLs
- San Luis Obispo County Stormwater Resources Plan (with Regional Water Management Group)
- San Luis Obispo County and Caltrans Los Osos Creek Bridge replacement planning group
- Caltrans San Luisito fish passage project planning group
- San Luis Obispo Council of Governments (Technical Advisory Council member)
- Cal Poly Facilities and College of Agriculture, Food and Environmental Sciences departments regarding scope of restoration projects on watershed holdings
- San Luis Obispo County Planning and Parks Departments regarding Pasadena Point disposition
- Watershed Stewards Program, a California Conservation Corps (CCC) program in partnership with AmeriCorps
- CCC
  Environmental Education Coalition of San Luis Obispo County (led by One Cool Earth)

Topic 2: NEP Program Implementation

NEP Administration and Governance Structure

How does the NEP organizational structure provide a clear and transparent decision-making process for actions based on both stakeholders' priorities and good science, facilitate decision-making autonomy for the Management Conference from the host entity, and allow the NEP to be seen as a leader in watershed management? How is the NEP ensuring that its Management Conference includes input from diverse populations and interests?

The MBNEP Management Conference is made up of the Bay Foundation of Morro Bay and the EC. The Bay Foundation of Morro Bay, a nonprofit 501(c)(3), serves as the host entity for the MBNEP. The all-volunteer board has a board of directors composed of diverse community members. The corporation is subject to the requirements of federal statutes and laws of the State of California, registers annually, submits public reports for the Secretary of State, and must prepare annual audits demonstrating compliance with Generally Accepted Accounting Principles and the US Office of Management and

Budget single audit requirements. The Bay Foundation board meets approximately monthly, and its meetings are open to the public.

The Bay Foundation, the host entity for the MBNEP, is responsible for developing and implementing all workplans and budgets in compliance with all relevant federal, state, and local regulations as well as grant obligations. The Bay Foundation Board approves workplans and budgets and provides oversight on activities, contracts, finances, legal matters, personnel, and policies. The EC focuses on higher-level programmatic oversight, approving workplans and budgets for MBNEP initiatives. Bay Foundation staff run the organization day-to-day and lead the implementation of the workplan. The Bay Foundation also collaborates with the CCRWQCB on surface and groundwater monitoring efforts and manages staffing and projects funded through separate sources of non-EPA funding.

The EC is comprised of representatives of local governments, EPA, CCRWQCB, the Bay Foundation, and other agencies whose members serve at the pleasure of their respective organizations. The EC also has members representing interest seats that include At Large Government Agency, Watershed Land Management, Local Fisheries, Science & Research, Tourism & Recreation, and the Environment. This group reviews and approves workplans and budgets, and provides advice on projects and policies. The EC meets quarterly, and its meetings are open to the public, agendas are posted in advance, and comments are welcome prior to decision making.

The MBNEP convenes non-voting Technical Advisory Committees (TACs) to provide critical input that directly informs activities across all program areas, including restoration, monitoring, education, and outreach. These committees are composed of experts and stakeholders with specialized knowledge relevant to the MBNEP's work. Staff engage TACs as a resource on an as needed or project basis, ensuring that planning and implementation efforts are informed by the latest science, best practices, and regional expertise. This flexible structure allows the MBNEP to adapt to evolving program needs while leveraging the expertise of partners and technical specialists.

This management structure has allowed the MBNEP to be a leader in the watershed, due in in part to the diversity of interests that are represented as well as the direct participation of locally elected officials who are appointed by and act on behalf of their respective organizations and must also answer to the voters of the watershed. The numbers and diversity of local and regional partners in the implementation of the CCMP is further evidence of the way the MBNEP is viewed as a leader in estuarine and watershed issues. In addition, the MBNEP staff sits on numerous local and regional committees related to water quality and other environmental issues. Examples of how the MBNEP is valued in this community is the MBNEP's numerous partnerships involving restoration, monitoring, outreach, and education. Some recent examples include a stormwater management project with State Parks, development of a teacher training series to reach environmental educators, and tech transfer to partners in a neighboring watershed to develop their own bioassessment monitoring program.

The MBNEP also provides data to support assessment and analysis by partners at the local, state, and federal level. This includes submittal of monitoring data to CEDEN, a publicly-accessible data portal. The program also partners with academic, regulatory, nonprofit, and other diverse partners on monitoring and restoration efforts in the watershed.

How do the NEP's staffing structure and planning promote stability and continuity of succession within the organization?

The MBNEP is headed by a management team consisting of the Executive Director, the Assistant Director, and the Finance & Operations Administrator. Together, these staff members manage the financial, personnel, contractual, and administrative aspects of the program. There is significant overlap in skills, with the goal of at least two members of the team having knowledge about any particular task. This structure ensures that there is knowledgeable review and oversight available for all administrative functions. With the departure of an Executive Director in FY22, the remaining management team was able to continue program operations, support the search for a new director, and help bring that new staff member up to speed. The best evidence of stability is the program's success during the pandemic, which required overcoming major disruptions to keep staff employed and projects on track.

Although major functional areas are supervised by different managers with appropriate professional expertise, there is significant cross training and shared responsibilities; staff in most functional areas can and do support others when needed. For example, monitoring and restoration staff frequently support education and outreach efforts.

How does the NEP plan to continue operations during emergencies?

The MBNEP has had direct experience with pandemic, wildfire, flooding, earthquakes, and tsunamis. Emergency protocols are in place and staff receive training on how to address these situations. All electronic files are backed up off-site to avoid loss of data, and the program has moved away from paper recordkeeping. The organization has experience with shifting between in person, hybrid, and remote work situations and could easily implement these if an emergency situation arises.

Highlight particularly beneficial characteristics as well as areas for improvement.

Hosting the program in a nonprofit corporation allows somewhat more flexibility and efficiency than larger entities like public agencies or universities, especially in the areas of policy decision-making, budgeting, grant overhead obligations, and hiring. There is a certain "nimbleness" that comes from operating in a smaller, independent organization with a very clear focus on its programmatic goals and activities. However, a small nonprofit such as the Bay Foundation lacks the financial and institutional security and infrastructure that may come from a program residing in a large-scale governmental entity. It is continually reliant on grants and donations and is responsible for all financial, human relations, and code-compliance that would be handled by a large parent organization. On the whole, however, the flexibility and efficiency of the nonprofit have proved valuable and the financial/administrative issues manageable, as evidenced by the long-term success and stability of the program. Areas for improvement include diversifying non-federal funding sources to enhance financial stability, building additional administrative and infrastructure capacity to support program growth, and investing in long-term staffing and fundraising strategies to ensure continued success.

Grant Obligations and Finance

Has the NEP consistently met all its EPA 320 (Base) and IIJA grant obligations?

Yes, the MBNEP has consistently met all EPA 320 base and IIJA grant obligations and maintains full compliance with federal grant management requirements. As a National Estuary Program, we ensure strong fiscal oversight, program implementation, and regulatory adherence for all EPA-funded activities.

The MBNEP successfully develops and submits annual workplans and budgets, aligning with the CCMP and regional conservation priorities. We provide semi-annual progress reports detailing project accomplishments, adaptive management approaches, and performance outcomes, along with end-of-year financial reports that document expenditures and funding allocations.

We uphold rigorous financial accountability, undergoing annual single audits in 2020, 2022, 2023, and 2024 and a limited scope independent audit (under the single audit threshold) in 2021 in accordance with Uniform Guidance (2 CFR 200) and federal grant compliance standards. From FY19 to 24, the MBNEP successfully completed independent financial audits with no findings, demonstrating strong internal controls, fiscal responsibility, and compliance with all EPA grant conditions.

Our program works closely with EPA Region 9's Program Manager to ensure adherence to all reporting, programmatic, and financial requirements of the NEP. Additionally, the MBNEP has successfully administered and monitored subawards, ensuring that all subrecipients comply with EPA financial and programmatic requirements, including financial oversight, deliverables, and reporting expectations.

Through transparent financial management, consistent reporting, and close coordination with EPA Region 9, the MBNEP continues to meet and exceed the expectations of the EPA 320 base and IIJA grant programs, ensuring that federal funds are effectively and efficiently utilized to support estuarine conservation and restoration efforts.

Have there been any challenges or problems encountered with cost sharing or implementing its federal NEP award?

The MBNEP has consistently exceeded the 1:1 match requirement for 320 base funding, but securing eligible non-federal match sources can be challenging. Some grants and funding sources have restrictions that prevent them from being used as match. Also, tracking, documenting, and reporting match requires significant administrative effort, particularly when aligning multiple funders' requirements and reporting timelines.

The IIJA funding has introduced additional complexity, requiring the creation and implementation of double workplans, budgets, approval processes, and reporting requirements. While the EPA has made efforts to streamline these processes by mirroring 320 base funding frameworks, the additional workload remains substantial. Managing two sets of workplans and budgets requires additional coordination, tracking, and staff capacity. Shifts in federal priorities, policies, and reporting requirements as well as unexpected funding freezes also introduce uncertainty and additional workload.

Administrative burdens and staff capacity also remain ongoing challenges. Managing multiple funding streams (federal, state, local, and private) requires extensive financial tracking, compliance oversight, and coordination with partners. As funding opportunities expand, ensuring sufficient staff resources to manage these processes efficiently is critical.

What were the sources of the required non-federal cost share of the NEP award?

The MBNEP's required non-federal cost share has been met through a variety of sources, including private donations to the Bay Foundation of Morro Bay and grants from academic, state, and nonprofit partners. Academic funding has included support from Cal Poly Sea Grant and Cal Poly's collaboration

with The Nature Conservancy on oyster research. State agency contributions have come from the California State Coastal Conservancy for Chorro Creek Ecological Reserve (CCER) floodplain restoration the CDFW for eelgrass restoration, and the OPC for the State Park Marina stormwater project. Nonprofit and private support includes grants from the Harold J. Miossi Charitable Trust for bioassessment monitoring (FY19–24) and for Mutts for the Bay (FY19-24), the Resource Legacy Fund for marine protected area education, and the Pacific Marine and Estuarine Partnership for eelgrass restoration (FY20). Additional cost share sources include the University of California, Santa Barbara's (UCSB) coastal dune restoration efforts. These diverse funding streams ensure the successful implementation of the MBNEP's work.

Have grant dollars been drawn down promptly in accordance with the terms and conditions of the grant for implementation of the EPA-approved workplan?

Yes, the MBNEP maintains a rigorous process for monthly accounting closeouts and timely grant drawdowns in accordance with EPA-approved workplans. This process is streamlined and documented through established financial and accounting protocols and policies.

Are there strategies in place for obtaining additional funding beyond the EPA (Base) and IIJA funds to implement CCMP actions (i.e., financial strategy)? Highlight particularly successful efforts and approaches as well as unique institutional challenges or difficulties in obtaining funding.

The MBNEP actively pursues external funding from local, regional, state, and private sources to supplement EPA 320 base and IIJA funds. Securing and managing grants is a key component of our financial strategy, allowing us to implement and expand CCMP actions. Recent successful grants include funding from the OPC for marina stormwater improvements, Restore America's Estuaries for tidal marsh studies and eelgrass habitat, and the USFWS for eelgrass recovery and dune restoration. Private grants have also supported bioassessment monitoring and the Mutts for the Bay program.

As a nonprofit, the MBNEP maintains donation mechanisms to support both general operations and specific projects. Annual fundraising efforts include an end-of-year campaign, sponsorship opportunities for Mutts for the Bay dispensers, and partnerships with other organizations for special fundraising events. The MBNEP also generates administrative fees through its partnership with the CCRWQCB, contributing to overall financial stability. The MBNEP received a consent decree from PG&E in the 1990s which helped establish the program and build partnerships. While most of this funding has been implemented, some is available as a non-federal source of funding to support projects.

To maximize the impact of available resources, the MBNEP strategically leverages its funding to provide match for priority projects and grants led by partners such as CSLRCD, State Parks, The Land Conservancy of SLO County (LCSLO), and other regional organizations. These collaborations expand the scope and effectiveness of restoration, monitoring, and conservation efforts throughout the watershed.

A particularly successful approach has been leveraging funding to provide match for priority projects and grants led by partners such as CSLRCD, LCSLO, and other regional organizations. These collaborations increase project reach and impact while reducing the financial burden on the MBNEP.

However, securing and managing diverse funding sources presents institutional challenges. Grant proposals require significant effort to prepare and remain highly competitive, meaning that not all

applications are successful. Also, managing multiple grants requires considerable administrative capacity, particularly in meeting reporting requirements and ensuring compliance with federal, state, and private funding obligations. Balancing these efforts while maintaining core program functions is an ongoing challenge.

Collaborating with local agencies, while beneficial, can also introduce bureaucratic and administrative complexities. For example, the OPC grant for the State Park Marina stormwater improvements project presented significant hurdles in processing invoices and coordinating administrative requirements, which delayed reimbursements and required additional staff time to navigate procedural challenges. These administrative burdens can slow project implementation and require ongoing coordination to resolve.

Despite these difficulties, the MBNEP maintains a strong general reserve fund and is eligible to receive State Water Board Supplemental Environmental Project funds, which provide additional resources for restoration and monitoring. By diversifying revenue streams and strengthening funding partnerships, the MBNEP continues to build financial sustainability while advancing its mission to protect and restore the Morro Bay estuary and watershed.

Budget Summary

The MBNEP's EPA 320 base funding supports the core operations and long-term programs essential to implementing the CCMP. The majority of base funding is allocated to personnel and fringe benefits, ensuring the capacity for staff to lead restoration, monitoring, education, and outreach efforts. Additional funding supports office operating expenses, professional services, and travel necessary for program implementation. A portion of the funding is dedicated to environmental monitoring, including water quality assessments and habitat surveys, as well as education and outreach efforts to engage the public. Restoration and protection projects receive targeted support, complementing other funding sources. This stable funding source enables the MBNEP to maintain strong programmatic oversight, stakeholder engagement, and long-term conservation planning.

The IIJA funding provides a significant expansion in restoration, protection, and environmental monitoring activities. Compared to EPA 320 base funding, IIJA funding is more heavily directed toward on-the-ground restoration efforts, including sediment reduction and watershed enhancement projects. A major portion also supports expanded environmental monitoring, including new water quality sensor deployments and data collection for estuary health assessments. While personnel and office expenses are covered, IIJA funding is structured to increase direct project implementation, with substantial allocations for professional services, education and outreach, and habitat restoration efforts. This funding allows the MBNEP to advance large-scale conservation actions that align with CCMP priorities while ensuring long-term resilience of the estuary and its watershed.

Table 1. CWA 320 Base Funding and IIJA Expenses during PE Period.

	320 (Base) Funding		IIJA	
	CE-98T25101	CE-99T43601	4T-98T47301	Total
Personnel	$1,331,693	$890,679	$375,692	$ 2,598,064
Fringe Benefits	$132,885	$79,724	$36,468	$ 249,077
Office Operating Expenses	$214,768	$179,786	$15,231	$ 409,785
Restoration & Protection	$17,703	$145,860	$567,855	$ 731,418
Environmental Monitoring	$109,636	$72,295	$374,780	$ 556,710
Education & Outreach	$41,028	$60,881	$78,487	$ 180,396
Professional Development	$4,423	$3,725	$4,479	$ 12,627
Travel	$31,926	$6,909	$1,288	$ 40,123
Repairs & Maintenance	$19,676	$7,627	$-	$ 27,303
Professional Services	$54,313	$31,441	$-	$ 85,754
Fees & Dues	$761	$821	$-	$ 1,582
Total	$1,958,812	$1,479,747	$1,454,279	$ 4,892,838

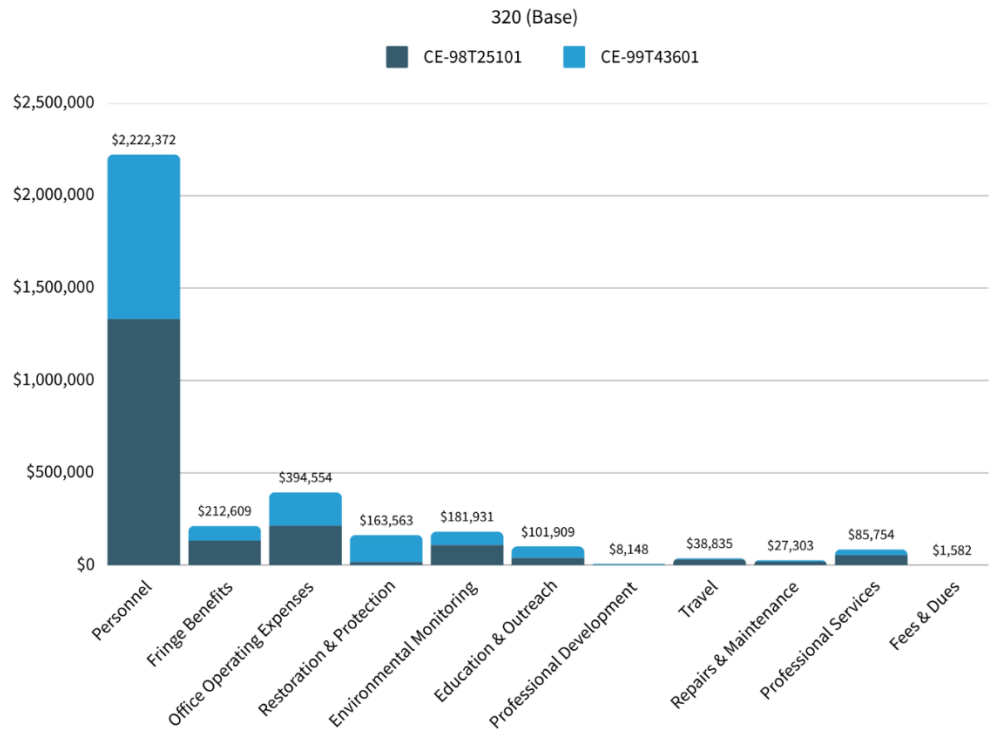

Figure 1. EPA 320 Base Expenses during PE Period

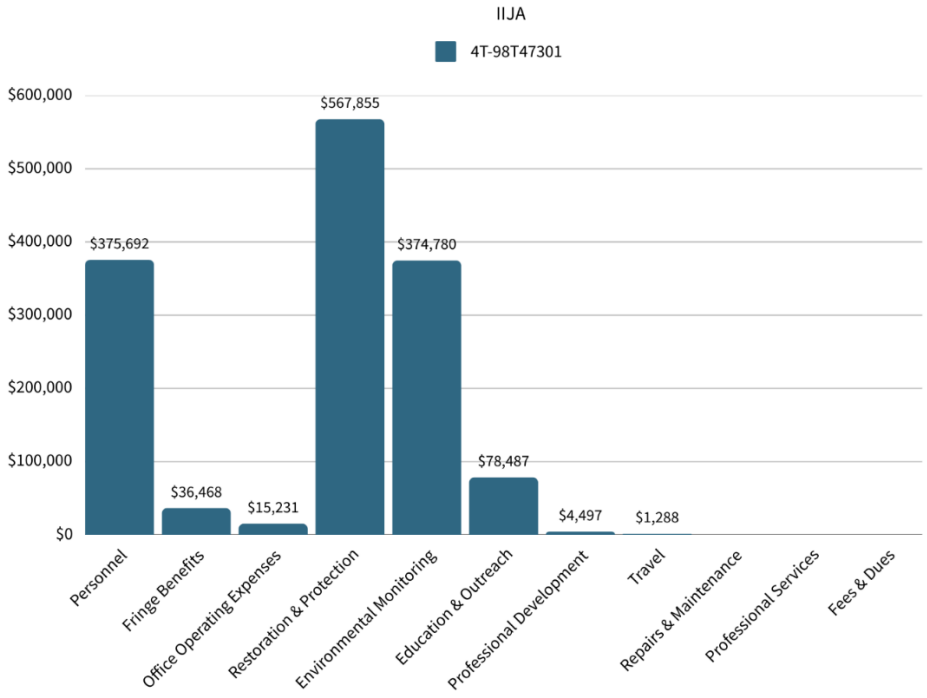

Figure 2. IIJA Expenses during PE Period

Expenses and Cash Match by Projects

The MBNEP strategically utilizes EPA 320 Base funding to secure non-federal cash match contributions, significantly expanding our impact across education and outreach, monitoring, and restoration efforts. During this PE period the MBNEP had an **overall leveraging ratio of approximately 1:5 – meaning that for every $1 of federal base funding, the MBNEP has secured an additional $5 in non-federal contributions**. By leveraging these federal funds, the MBNEP has successfully brought in substantial external funding to support priority CCMP actions. Across all three program areas, the MBNEP has secured $2,135,582 in cash match contributions during the PE period. Leveraging information from NEPORT is provided in the NEPORT summary tables in the next section. Please refer to NEPORT for project-specific leveraging information. Note that NEPORT leveraging information is typically compiled and reported in early September on a different timeline than our fiscal year, which can account for differences in cash match values. NEPORT leveraging information is for fiscal year 2020 through 2024.

Education & Outreach

Through partnerships with private donors, foundations, and local organizations, the MBNEP has secured over $311,234 in cash match contributions, representing 67% of the total funding in this category. These funds have supported education programs, the Mutts for the Bay initiative, community engagement efforts, and environmental education curriculum—allowing the MBNEP to broaden its public outreach while reducing reliance on federal funds.

Monitoring

The MBNEP has secured $217,557 in cash match contributions, covering key monitoring programs such as bioassessment, water quality monitoring, and eelgrass research. This 61% match ratio has allowed the MBNEP to expand data collection efforts and improve long-term tracking of estuary health.

Restoration

The largest category for leveraged funds, restoration efforts, received $1,606,792 in cash match contributions, representing 69% of total funding for restoration projects. These non-federal funds supported habitat restoration, fish habitat improvements, stormwater infrastructure, and invasive species management, ensuring that federal funds are multiplied to achieve broader conservation goals.

By strategically leveraging EPA 320 base funds, the MBNEP has significantly increased its overall funding capacity, bringing in additional resources to implement high-priority projects that align with CCMP goals and regional conservation needs.

Table 2. Program expenses by EPA 320 base funds, IIJA funds, and cash match for PE period.

	320 Funds	IIJA Funds	Cash Match	Total
Education and Outreach	$101,805	$53,758	$311,234	$466,797
Monitoring	$142,021	$222,033	$217,557	$581,611
Restoration	$163,563	$567,855	$1,606,792	$2,338,210
Total	**$407,389**	**$843,647**	**$2,135,582**	**$3,386,618**

NEPORT Leveraging Summary

Table 3. Total cash leveraged and total in-kind leveraged by fiscal year.

Fiscal Year	Total Cash Leveraged	Total In-Kind Leveraged	Total
2020	$236,180	$1,234,407	$1,470,587
2021	$92,944	$787,723	$880,667
2022	$946,834	$2,559,321	$3,506,155
2023	$186,102	$1,002,224	$1,188,326
2024	$92,897	$1,306,792	$1,399,690
5 Year Cumulative	**$1,554,957**	**$6,890,467**	**$8,445,425**

Table 4. Total primary and significant leveraging by fiscal year.

Fiscal Year	Primary Leveraging	Significant Leveraging	Total
2020	$351,609	$210,402	$562,011
2021	$143,285	$132,258	$275,543
2022	$864,486	$1,710,275	$2,574,761
2023	$306,382	$88,931	$395,313
2024	$191,927	$300,339	$492,266
5 Year Cumulative	**$1,857,689**	**$2,442,205**	**$4,299,894**

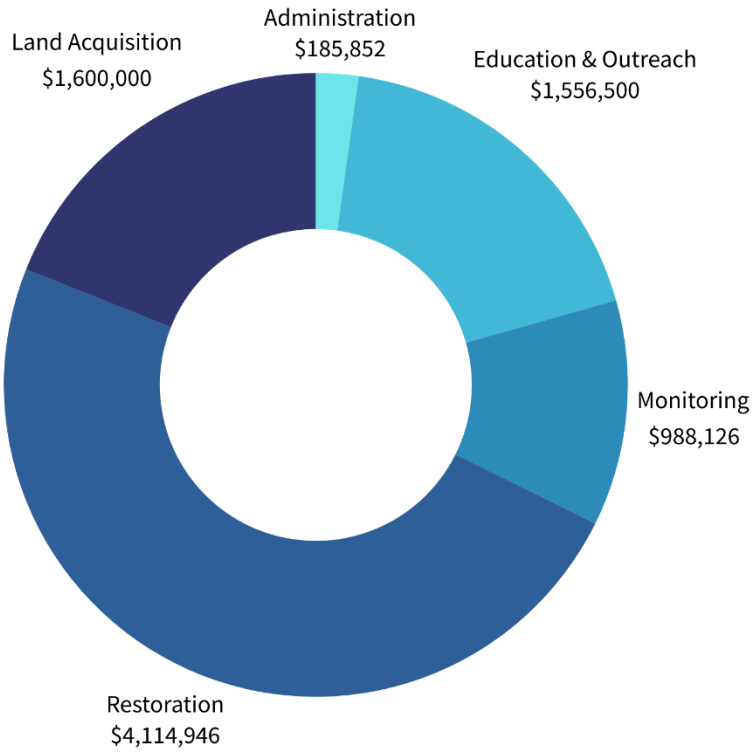

Figure 4. Total leveraging by program area.

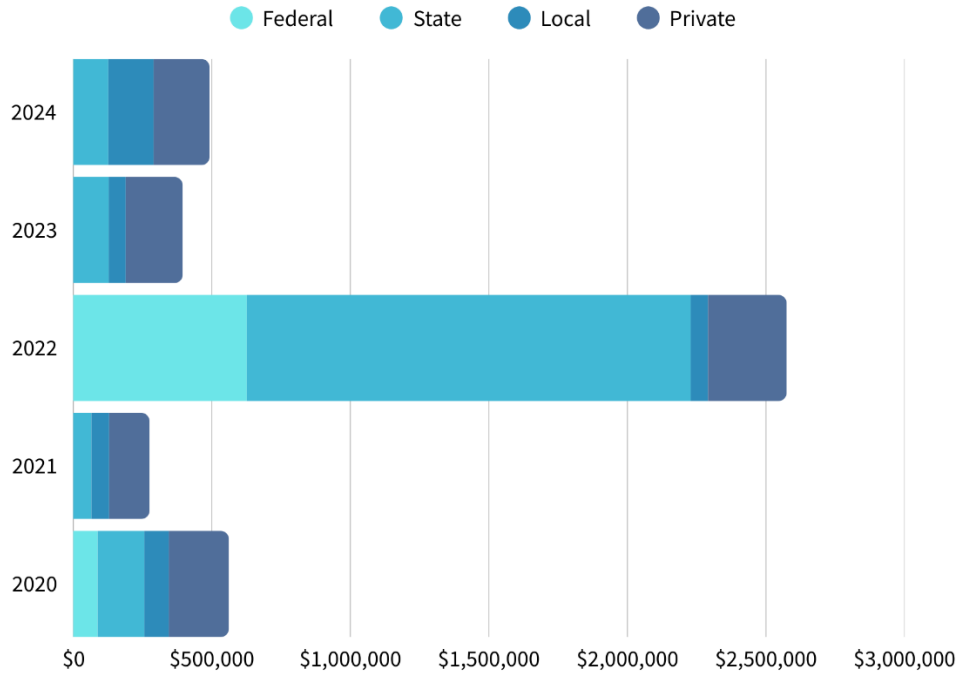

Figure 5. Total primary and significant leveraging by type and fiscal year.

Opportunities for Improvement and NEP Priorities

How has the NEP addressed challenges (referred to in this guidance as opportunities for improvement) identified in the previous PE?

In the 2020 PE, four opportunities for improvement were identified.

Reporting on Conditions and Outcomes of Pollution Reduction Projects

The MBNEP has improved its ability to assess and communicate environmental outcomes of restoration, monitoring, and protection projects through expanded data collection, partnerships, and public communication.

Demonstrating Environmental Outcomes

The MBNEP continues to incorporate pre-, post-, and ongoing monitoring into its projects, where applicable and feasible. Notable examples include sediment modeling for the CCER restoration project, nitrate and flow monitoring in Pennington Creek, and shoreline seeps studies related to groundwater impacts. New efforts also include expanded dune monitoring at the sandspit in collaboration with UCSB to evaluate changes over time and share findings with the broader community. These efforts generate valuable estimates of pollutant reduction, sediment capture, and habitat recovery that inform adaptive management.

Sharing Results with the Public

The MBNEP shares project outcomes and environmental data through blogs, outreach events, and dedicated online platforms. Key milestones were the release of the State of the Bay 2020 and 2023 Reports, which synthesized monitoring results to answer key questions about the health of the bay and watershed. Public engagement events and web resources helped broaden awareness and interpretation of findings.

Accessible Metrics and Restoration Highlights

The MBNEP maintains and shares updated habitat data through web features such as the Eelgrass Monitoring Page, which includes a new bay-wide map published in 2024 showing a dramatic eelgrass rebound to approximately 750 acres. The floodplain restoration update for CCER provides visuals and drone footage to communicate project impacts. The MBNEP also publishes sediment monitoring reports, creek health memos, estuary health memos, eelgrass reports, blogs, and annual collective impact reports. These materials are available through our online library and are designed to communicate key metrics and environmental trends to partners, funders, and the public.

Tracking CCMP Implementation

In response to EPA's recommendation to create a public-facing version of the MBNEP's internal CCMP tracking tools, the MBNEP launched a new CCMP Implementation Tracker Story Map in 2024. This online tool offers an interactive, accessible way for stakeholders and the public to explore the scope of CCMP Action Plans across the program's eight priority areas: Land Protection, Water Quality Standards & Monitoring, Best Management Practices, Ecosystem Conservation & Restoration, Freshwater Flows, Extreme Weather Events, Environmentally Sound Estuarine Resource Use, and Education & Outreach.

The tracker replaces the older "Our Impact" webpage and provides updates that highlight major initiatives for each priority area. Each section includes brief summaries and key accomplishments. For example, users can explore targeted updates related to the Mutts for the Bay program and eelgrass monitoring and restoration efforts.

The new HPRS also played a key role in improving CCMP tracking by defining clear ecological goals and measurable metrics for many of the CCMP's restoration-related Action Plans. The MBNEP also initiated a review of the status of all Action Plans to support content development and data verification. Metrics, partner collaborations, and highlights were compiled to ensure the Story Map offers a compelling narrative for both technical and non-technical users.

To ensure continuous improvement, the 2027 CCMP revision will build upon this work by incorporating timelines, measurable targets, and simplified formatting to further streamline tracking and measuring progress. These improvements will allow for even more effective communication with funders, decision-makers, and community members, ensuring continued transparency and alignment with regional conservation goals.

Outreach Efforts Targeting a Diverse Audience of Visitors

The MBNEP has significantly broadened its outreach efforts to engage visitors, residents, students, and environmental partners through new educational resources, collaborations, and strategic engagement with local businesses.

Interactive Community Engagement & Events

The MBNEP engaged between 100 and 300 attendees per event at seasonal Downtown San Luis Obispo and Morro Bay Main Street Farmers Markets, events that are popular with visitors. Science on Tap is a new initiative that brings informal, small-group discussions to local breweries and businesses, providing digestible "tidbits" of estuary science, bay health, and conservation efforts. Science Exploration Events are larger, in-depth technical public events featuring presentations from the MBNEP and partners on current research, restoration projects, and community engagement opportunities. The MBNEP also expanded its digital outreach by launching a dedicated Instagram account for Mutts for the Bay and participated in community events such as the Woods Humane Society Festival to increase awareness of pet waste pollution prevention.

Engaging Visitors Through Local Businesses and Tourism

To connect with Morro Bay's large visitor population, the MBNEP distributed custom maps and tide books to local hotels and businesses. These resources, valued by kayakers and tidepool explorers, provide conservation information while helping visitors navigate the estuary responsibly. The MBNEP also distributed reusable coasters to local bars and coffee shops, popular gathering spots for visitors, to highlight the impacts of marine debris on bay health. Additionally, the MBNEP launched a small-scale pilot recreational use survey to better understand visitor activities, usage patterns, and potential impacts to the bay.

Expanding Environmental Education and Watershed Learning

The MBNEP expanded environmental education by partnering with One Cool Earth, Camp Ocean Pines, Camp KEEP, and Creek Lands Conservation to engage over 10,000 students in hands-on estuary and watershed science. Field trips brought inland students to Morro Bay for immersive learning experiences, while teacher training workshops provided educators with resources to integrate estuary science into their classrooms. During Watershed Week, the MBNEP trained One Cool Earth educators, supporting watershed education in 28 schools across San Luis Obispo County through interactive lessons, activities, and conservation strategies

Enhancing Education & Scientific Collaboration

The MBNEP partnered with the Rancho Marino Reserve, a University of California Natural Reserve, to provide guest lectures, field trips, and hands-on experiences for college students and researchers. The MBNEP also supported outreach efforts for Sea Otter Savvy, Pacific Wildlife Care, and the SLO Beaver Brigade, assisting with public education on marine wildlife conservation, habitat restoration, and human-wildlife interactions.

The MBNEP has also increased the accessibility of our content by translating the most popular educational handouts into Spanish to better serve visitors. The 101 brochure and bird guide were translated into Spanish, distributed in our Nature Center, and made available on our website. In June 2024, the Estuary Program and the Monterey Marine Protected Area Collaborative also utilized grant funding to distribute 31,000 coloring books translated in both Spanish and Traditional Chinese throughout all Marine Protected Area Collaboratives in California. The materials are also accessible online and are ADA-approved.

Local Media and Public Awareness

The MBNEP's visibility in local media has grown, with over 20 news articles highlighting water quality, eelgrass restoration, and habitat conservation. A full list of media coverage is available at MBNEP News and notable coverage includes:

- How Good is the Water Quality off Morro Bay Coast? New Sensors Track Conditions in Real Time – The Tribune, 2023
- Eelgrass Almost Died Off in Morro Bay Estuary. Now, it's Made a Record Rebound – The Tribune, 2022
- Study Identifies Morro Bay Estuary as Site to Restore Native Oysters – KCBX, 2021

Water Reuse and Hazard Mitigation Projects:

In response to EPA's recommendation to pursue water reuse and hazard mitigation strategies, the MBNEP has made substantial progress implementing on-the-ground projects and advancing planning efforts to address watershed stressors. The Pennington Creek rainwater catchment project, originally highlighted by EPA as a national example of innovative water reuse, has expanded through partnerships with Creek Lands Conservation, Cal Poly, and the CSLRCD. Designs for added storage and system upgrades are underway to enhance dry-season supply. The MBNEP has also supported groundwater monitoring well rehabilitation and installation in Los Osos to help improve the capacity to monitor drinking water sources to better manage groundwater in the face of saltwater intrusion, supported by IIJA funding.

To address hydrologic and ecological vulnerabilities, the MBNEP expanded monitoring efforts, including bay water quality sensors installed in partnership with Cal Poly and Central & Northern California Ocean Observing System (CeNCOOS). These sensors provide near real-time data to help track changes in estuarine health and inform habitat restoration efforts. The MBNEP also expanded drought and streamflow monitoring efforts across the watershed to target areas for future conservation projects.

Long-term planning to guide the MBNEP efforts is reflected in the HPRS. This document incorporates analyses and metrics and presents them in a habitat-based format that outlines measurable targets, key threats, and project priorities across habitat types. The HPRS builds directly on existing planning documents that identify environmental stressors, providing a comprehensive roadmap for strategic restoration, protection, and adaptive management.

The MBNEP has also initiated new partnerships to address infrastructure vulnerabilities and habitat threats. Working with the San Luis Obispo Council of Governments and the CSLRCD, the MBNEP is supporting projects that address the risks of flooding, erosion, and ecological degradation, especially following the severe winter storms of 2023. These efforts emphasize both pre-disaster planning and post-disaster response using science-based data and regional collaboration.

Together, these activities demonstrate the MBNEP's commitment to implementing adaptive, science-informed strategies that reduce risks associated with extreme weather events, water scarcity, and ecosystem degradation, while aligning with CCMP priorities and EPA's Water Reuse Action Plan goals.

What kind of obstacles, if any, has the NEP faced with CCMP implementation (political, institutional, etc.) and what has the NEP done to overcome those obstacles? How can the EPA (regions/HQ) support the NEP's efforts to address these obstacles?

Complex Partnerships and Jurisdictional Challenges

Implementing the CCMP across the Morro Bay watershed requires coordination with a wide range of partners, including local, state, and federal agencies, nonprofit organizations, volunteers, and private landowners. Navigating overlapping jurisdictions and permitting requirements can slow implementation timelines, particularly for large-scale restoration and infrastructure projects. For example, the State Park Marina stormwater improvement project, funded by the OPC, highlighted challenges associated with invoicing delays and administrative processes when partnering with a large public agency. The MBNEP has addressed these challenges by maintaining clear communication with partners, documenting processes, and building strong, long-term relationships to foster trust and shared accountability.

TMDL Implementation and Regional Capacity Constraints

Despite strong local progress, certain TMDL targets have not been met. A contributing factor is limited staffing and funding at regulatory agencies like the CCRWQCB, which hinders the ability to advance implementation and enforcement. The MBNEP continues to support water quality improvements through voluntary best management practices, monitoring, and project implementation but progress toward some targets may remain constrained without increased regional capacity and support.

Administrative Burden of Federal Funding Programs

The addition of the IIJA funding has brought important resources to the region, enabling the MBNEP to implement new restoration, monitoring, and education projects. However, it has also effectively doubled administrative and reporting responsibilities due to the need for parallel workplans, budgets, and semi-annual reporting requirements. While EPA has made efforts to streamline these processes by aligning IIJA and EPA 320 base expectations, the administrative burden remains significant for a small organization. Continued support in aligning reporting systems, timelines, and expectations would help ensure long-term program sustainability.

Federal Funding Certainty and Strategic Planning

As a program deeply reliant on federal support, the MBNEP depends on consistent EPA funding to implement core programs and provide the match needed to secure additional grants. Periods of federal uncertainty, such as shifts in guidance or delays in grant processing, create difficulties in staffing, planning, and long-term project commitments. While the MBNEP has remained financially stable through careful planning, funding reserve management, and proactive fundraising, consistent and predictable funding remains essential for successful CCMP implementation and for maintaining momentum across the region.

What difficulties or priorities does the NEP anticipate during the next five years?

Over the next five years, the MBNEP anticipates several priorities and challenges that will shape program direction and implementation. A primary focus will be on advancing the goals of the 2022 CCMP through continued restoration, monitoring, and education efforts, while also preparing for the 2027 CCMP revision. That revision will emphasize measurable metrics, timelines, and enhanced tracking

to streamline implementation and improve accountability. The process will incorporate input from the Management Conference, TACs, other program partners, and the public.

Key challenges include maintaining momentum on long-term projects in the face of uncertain federal and state funding cycles, responding to increasing extreme weather impacts, and navigating complex permitting and jurisdictional landscapes. The MBNEP will also need to continue expanding outreach and engagement to meet the needs of a growing population while ensuring science remains central to decision-making.

Strategic priorities will include building partnerships to address persistent water quality impairments, targeting projects to address water quantity issues, implementing habitat projects with multiple benefits, improving data collection and communication tools, and increasing local capacity through collaborative funding and technical assistance. The continued support of EPA and other partners will be critical to sustain this momentum and advancing shared goals for a resilient and healthy Morro Bay estuary and watershed.

Topic 3: NEP Ecosystem and Community Status

The following information shows how the NEP applies and connects the everyday work of the NEP with the foundational goals of the CWA and the EPA priorities for achieving them. Please fully address all the topics and associated questions clearly, providing details about how progress and outcomes are being achieved rather than yes/no responses.

Community and Stakeholders Engagement

How does the NEP ensure that the public has access to the decision-making process and engagement opportunities?

As a community-based organization, the MBNEP ensures transparency, accessibility, and public engagement in decision-making processes through a variety of channels. Our approach includes publicly available resources, structured advisory bodies, outreach events, and direct community engagement to ensure that stakeholders, partners, and residents can participate in the stewardship of the Morro Bay estuary. All EC meetings are open to the public, and public comment is welcome. During times of major program review such as CCMP revisions, staff hold public sessions to gather input from program partners and the public. Outreach efforts to improve engagement include social media, blogs, newsletters, website, and public events.

Public Access to Information and Decision-Making

The MBNEP maintains an open-access online library, where we share project results, monitoring data, and scientific analyses, ensuring that the public has access to the latest information about estuary conditions and program activities. Additionally, we support public participation in governance through our Management Conference, which provides oversight and input into program priorities and decision-making. This structure includes the Bay Foundation of Morro Bay Board of Directors, which provides high-level governance; the EC, a voting body of key stakeholders that meets regularly to discuss program direction; and several TACs, where experts provide guidance on specific environmental and scientific issues related to estuary health.

In addition to standing committees, the MBNEP forms TACs by technical area to provide expert input on critical initiatives. The Historical Ecology Study TAC brings together researchers and local experts to analyze pre-development landscape conditions and inform restoration planning. The Coastal Dune Restoration TAC advances science-based approaches for restoring dune systems along the Central Coast. These committees help ensure that decisions are based on the best available science and reflect regional environmental priorities.

Beyond internal committees, the MBNEP regularly presents project findings and monitoring results to local and regional decision-making bodies. We frequently report to the city of Morro Bay's Harbor Advisory Board, where we share updates on estuary conditions, restoration progress, and water quality monitoring. Additionally, we present findings to local planning and environmental organizations, as well as academic institutions and professional conferences, to foster collaboration, knowledge-sharing, and data-driven management.

Community Outreach and Engagement Opportunities

The MBNEP actively engages the public through a range of outreach, education, and volunteer events, ensuring that community members have opportunities to participate in estuary conservation. Our public outreach events include tabling at festivals, environmental fairs, and other community gatherings, where residents can learn about the estuary and ongoing projects. We also host hands-on stewardship events, such as habitat restoration days, estuary and beach clean-ups, and volunteer-driven monitoring programs, allowing community members to contribute directly to monitoring and conservation efforts.

Educational engagement is another key component of our outreach strategy. The MBNEP presents at local academic institutions, offering students insight into applied environmental science and estuary management. Additionally, our staff frequently speak at nonprofit and community group events, sharing information on monitoring programs, restoration work, and regional conservation priorities. The MBNEP also engages directly with residents and stakeholders when local concerns arise, ensuring that the community has a voice in estuary-related decisions.

Through open access to decision-making, public meetings, and direct engagement opportunities, the MBNEP fosters a collaborative approach to protecting and restoring the estuary. By ensuring that the local community remains informed, involved, and empowered in conservation efforts, we create a stronger, more engaged network of stewards dedicated to the long-term health of Morro Bay.

How has the NEP engaged the variety of community members and stakeholders in the NEP study area?

The MBNEP is committed to engaging a broad range of community members, students, educators, environmental organizations, and decision-makers throughout the NEP study area. By working closely with partners, schools, nonprofits, and local agencies, we maximize the impact of our education and outreach efforts to connect diverse audiences with the estuary and its watershed.

Collaborative Education and Outreach Efforts

The MBNEP actively participates in collaborative education and outreach initiatives, partnering with local schools, environmental education organizations, and community groups to increase environmental literacy. Through these efforts, we have:

- Led field trips for Title 1 schools, providing students with hands-on learning experiences in estuarine and watershed science
- Engaged teachers in professional development programs, offering environmental literacy and watershed science training to enhance classroom instruction
- Supported environmental education organizations, including Camp Ocean Pines, where we helped install a new touch tank and watershed lab to improve student learning opportunities
- Provided training to local outdoor educators, ensuring that environmental education programs throughout the region reflect best practices in estuarine and watershed science
- Presented at local organizations and community groups, broadening awareness of estuary conservation and scientific research

These partnerships expand our reach beyond direct MBNEP programming, strengthening environmental education efforts throughout the Morro Bay watershed and beyond.

Public Events and Community Engagement

In addition to structured education programming, the MBNEP engages a broad cross-section of stakeholders through public events, outreach, and collaborative initiatives. One of the most significant engagement efforts is the State of the Bay event, which occurs every three years and includes a series of public events designed to increase awareness, provide scientific updates, and foster community involvement in estuary conservation.

Beyond large-scale events, the MBNEP also uses the engagement methods outlined in the previous response, including:

- Hosting public outreach events, restoration days, and cleanups
- Presenting scientific findings to local advisory boards, community groups, and partner organizations
- Engaging directly with residents when local concerns arise

By combining collaborative education efforts, teacher and student engagement, public outreach, and direct stakeholder involvement, the MBNEP ensures that a diversity of community members have opportunities to learn about, participate in, and contribute to the protection and restoration of the estuary.

What is the level of engagement from the stakeholders and the public?

The MBNEP fosters strong engagement with both stakeholders and the broader public through a variety of opportunities, ensuring meaningful participation in estuary conversation and decision making.

- Stakeholder Engagement: The MBNEP works closely with stakeholders through the EC, which provides programmatic oversight and guidance, and TACs, which bring together experts to inform restoration, monitoring, and outreach efforts. The MBNEP also collaborates with key partners, including local governments, nonprofits, academic institutions, and environmental organizations, to implement conservation projects and research projects.
- Public Engagement: Hands-on opportunities such as volunteer clean-ups, volunteer monitoring, and restoration days allow community members to take an active role in conservation. The Nature Center serves as an educational hub, while outreach events including Science on Tap, Science Explorations, and tabling at farmers markets and community events help connect people of all backgrounds to estuary science and stewardship.
- Digital Engagement: The MBNEP reaches a broader audience through social media, blogs, newsletters, and an open-access website, keeping the public informed about ongoing projects, monitoring results, and opportunities to get involved.

By combining direct stakeholder collaboration with public outreach and education, the MBNEP ensures that a wide range of voices and interests are engaged in the protection of Morro Bay.

Where and how could the level of engagement be improved?

Despite strong community involvement, there are opportunities to expand engagement and reach more diverse audiences. By refining outreach strategies and expanding opportunities for hands-on participation, the MBNEP can further strengthen community connections and broaden its impact.

- Marketing & Advertising: Expanding outreach through paid ads, social media promotions, and inclusion in local event calendars, newspapers, and magazines could increase visibility throughout the population.
- Social Medial Challenges: Frequent posting is needed to stay visible, and changing algorithms makes organic reach difficult. Exploring targeted advertising or boosted posts could help.
- Targeting Key Audiences: Identifying where and how to reach targeted audiences remains a challenge. Partnering with additional organizations could enhance connections.
- High interest in Hands-on Restoration Events: Community members consistently express interest in participating in hands-on restoration events, such as invasive plant removal and habitat restoration. Expanding these opportunities could strengthen engagement.
- Expanding Monitoring Opportunities: There is strong community interest in volunteer monitoring and supporting community science efforts. Expanding volunteer monitoring increases stewardship throughout the community. The MBNEP lacks the staff and programmatic capacity to expand the program to meet the level of interest.
- Increasing Digital Engagement: While blog subscribers grow steadily, click-through rates on blog posts could be improved with SEO enhancements and optimized email subject lines to increase open rates.

Education and Outreach

How is the NEP effectively promoting and creating widespread recognition of the Program?

The MBNEP actively promotes its mission, projects, and accomplishments through a multi-faceted communications and engagement strategy. By leveraging digital media, print materials, in-person outreach, and educational programming, we ensure that a broad audience, including community members, educators, visitors, and decision-makers, recognizes and understands the value of our work.

Strategic Communications and Outreach

The MBNEP produces a variety of written and digital materials to share program updates, scientific findings, and engagement opportunities. Our newsletter, blog, brochures, and social media channels reach a wide audience, providing accessible information about estuary health, restoration efforts, and community initiatives. The MBNEP website and online library serve as central hubs for program materials, allowing stakeholders and the public to access monitoring data, project reports, and educational resources.

In-Person Engagement and Community Events

Direct engagement remains a key component of our outreach strategy. MBNEP staff regularly host and participate in community events, including tabling at festivals, environmental fairs, and public meetings. These events provide face-to-face opportunities for residents, visitors, and stakeholders to learn about the estuary program, ask questions, and explore ways to get involved.

Additionally, the MBNEP's free Nature Center provides a welcoming space for the public to explore estuarine science and conservation. Unlike the paid-entry Morro Bay State Park Museum of Natural History, the MBNEP's Nature Center is freely accessible, lowering barriers to engagement and making estuary education available to all.

Field Trips, Teacher Trainings, and School Partnerships

The MBNEP enhances program recognition through direct engagement with students, teachers, and schools. Our field trip programs bring students into the watershed for hands-on learning, while teacher training workshops equip educators with environmental literacy tools to integrate estuary science into their curricula. Many local schools actively use MBNEP materials in their lesson plans, further expanding our impact and recognition among educators and students.

By combining strong digital and print communication efforts with in-person events, free public education spaces, and long-term partnerships with schools and teachers, the MBNEP continues to expand public awareness and recognition of its mission and impact in the Morro Bay watershed and beyond.

What are some of the impacts of outreach and educational activities?

The MBNEP's outreach and education efforts have far-reaching impacts, fostering environmental stewardship, increasing awareness of conservation efforts, and inspiring community action. Through

school programs, public events, and direct engagement, we create lasting connections between people and the estuary, ensuring long-term support for its protection.

Cultivating the Next Generation of Environmental Stewards

One of the most significant impacts of the MBNEP's education programs is inspiring future environmental leaders. By engaging students in hands-on field trips, classroom presentations, and stewardship projects, we provide meaningful experiences that shape their understanding of local ecosystems. Many of these students go on to pursue careers in conservation, volunteer for restoration projects, or continue learning about environmental science.

Additionally, our teacher training programs and partnerships with schools ensure that environmental education is embedded in classroom curricula, expanding our reach beyond direct student interactions. Programs like Watershed Week, which this year reached 32 schools throughout the county, help students connect with their local environment and understand the role they play in protecting natural resources.

Increasing Awareness and Encouraging Community Involvement

Public outreach efforts raise awareness of the MBNEP's mission and activities, leading to increased volunteerism, community participation, and donations. When people understand the work we do, they are more likely to support restoration projects, attend events, and contribute resources.

A prime example of successful engagement is the Mutts for the Bay campaign, which educates dog owners about responsible pet waste disposal to prevent bacteria from entering the estuary. This initiative has led to increased awareness and behavior changes among pet owners, reducing pollutants and improving water quality.

Strengthening Community Connections to the Estuary

The MBNEP's outreach creates long-term relationships with individuals, schools, and organizations that continue to support and advocate for estuary conservation. Whether through educational events, volunteer restoration days, or community science programs, we provide opportunities for people to develop a deeper understanding of estuarine ecosystems and their role in protecting them.

By fostering environmental stewardship, increasing awareness, and inspiring community action, the MBNEP ensures that outreach and education efforts have a lasting impact on the Morro Bay watershed and beyond.

What are some ways these activities could be improved?

While the MBNEP's outreach and education efforts have been highly effective, there are always opportunities to expand our reach, improve engagement strategies, and adapt to changing community needs. By refining our approach to targeting audiences, recovering from past disruptions, and leveraging new engagement methods, we can ensure that our programs continue to have a meaningful impact.

Enhancing Outreach to a Broader Audience

A key area for improvement is better understanding of where different community members get their information and tailoring our outreach efforts accordingly. This includes:

- Identifying and utilizing different communication platforms (e.g., social media, local news, newspapers, community newsletters, in-person gatherings) to reach a broader and more diverse audience
- Expanding language accessibility and culturally relevant outreach materials to engage all parts of the community
- Strengthening partnerships with local community organizations, neighborhood groups, and schools to better integrate environmental education into their existing networks
- Offering alternative formats for engagement, such as virtual sessions, hybrid events, and interactive digital content, to ensure access for all audiences

By making our engagement efforts more intentional and inclusive, we can ensure that a wider range of community members feel informed and connected to the estuary and its conservation efforts.

Recovering from COVID Impacts and Rebuilding Educational Partnerships

The COVID pandemic significantly disrupted outreach efforts, limiting in-person events and causing lasting impacts on education partners, school programs, and environmental organizations. Some of the ways the MBNEP can continue recovering include:

- Rebuilding school and education partnerships that were affected by shutdowns by re-engaging teachers, expanding field trip offerings, and refreshing educational materials
- Strengthening support for environmental education organizations that have had to adapt or scale back their programs, such as Camp Ocean Pines and other local outdoor education centers
- Increasing flexibility in programming, providing both in-person and virtual options to accommodate schools and community groups that have faced logistical challenges since the pandemic
- Assessing shifts in public engagement behaviors post-pandemic and adapting strategies to meet the evolving needs of schools, families, and community members

By targeting outreach more effectively and rebuilding engagement opportunities impacted by the pandemic, the MBNEP can strengthen its connections with the community, improve program accessibility, and expand its long-term impact.

Monitoring and Assessment

How do the NEP's monitoring plan and indicators produce data to support a comprehensive and integrated analysis of environmental conditions (e.g., environmental progress report that communicates ecosystem status and trends, aka State of the Bay/Estuary Reports)?

The MBNEP's Monitoring Plan lists the key indicators and details on data collection. The collected data supports updating of State of the Bay indicators that demonstrate the health of the estuary and watershed. The data collected is shared via a SWRCB portal and utilized for assessments of 303(d), TMDLs, etc. The Monitoring Plan was developed to be sustainable in order to provide a consistent long-

term ambient data set. Guidance on monitoring indicators comes from project partners, research partners, regulators, and other entities that provide technical guidance to the MBNEP.

How does the NEP use monitoring results to re-direct management actions and programs implemented under the CCMP?

Monitoring data is used to guide CCMP implementation. The data is used to identify areas of concern and develop potential implementation projects. Some examples include flow monitoring to determine projects to address water withdrawals and bacteria monitoring to identify areas for BMP implementation and support management of shellfish growing waters. Monitoring data can also be used to assess project effectiveness. The MBNEP shares data with partners to inform their own management efforts. A recent example is sharing bacteria indicator data with state regulators and shellfish farmers to better manage shellfish growing waters in the bay.

How are research efforts used to identify missing data that warrant additional monitoring or sampling (if applicable)?

Research partnerships played a key role in one of the MBNEP's greatest environmental challenges – catastrophic loss of bay eelgrass. Research helped determine the genetic health, predator impacts, erosion impacts, and water quality factors that affected eelgrass. Additionally, research helped expand the mapping and monitoring efforts to track eelgrass health. An experimental approach was taken for restoration to scientifically determine the optimal methods for eelgrass transplanting. Long-term eelgrass monitoring and mapping were informed by these research partnerships. Several ongoing research partnerships are addressing tidal marsh habitat changes, dune restoration methodologies, and other aspects of the MBNEP's monitoring.

Clean Water Act Programs Relationship

How does the NEP support the goals of the CWA? Highlight the best examples not already identified in previous sections. An example does not need to be provided for each CWA Program listed below.

Strengthening Water Quality Standards

The MBNEP contributes to the development and refinement of regional water quality standards through long-term monitoring, data analysis, and coordination with the CCRWQCB. Our monitoring results help identify trends in water quality, support local decision-making, and guide habitat restoration efforts aligned with regional water quality goals.

Improving Water Quality Monitoring

The MBNEP maintains a long-running, science-based monitoring program that informs watershed management and supports data-driven decision making. The program includes estuary health assessments, creek bioassessment surveys, and stormwater monitoring. The MBNEP integrates up-to-date tools such as benthic macroinvertebrate bioassessment and environmental DNA (eDNA) analysis to improve detection of biological and ecological change. Through partnerships with Cal Poly and CeNCOOS, real-time bay water quality sensors monitor temperature, salinity, dissolved oxygen, turbidity, and other parameters. Monitoring results are synthesized in technical reports, public dashboards, and memos that guide restoration, engage the public, and support CWA objectives.

Developing Total Maximum Daily Loads

While the MBNEP does not develop TMDLs directly, the program supports implementation and tracking through sediment, bacteria, and nutrient monitoring. The MBNEP also shares its data with the CCRWQCB to help evaluate progress toward TMDL targets and understand the effectiveness of local pollution control and restoration projects. The program's data is also part of the Integrated Report process and the 303(d) assessment for impaired waterbodies. If the MBNEP's data helps to identify a water quality issue, the next step could potentially be development of a TMDL. The MBNEP's work is especially important given reduced state resources for TMDL implementation.

Controlling Nonpoint Source Pollution on a Watershed Basis

The MBNEP actively reduces nonpoint source pollution (NPS) through restoration projects, public education, and community partnerships. Efforts include road improvement and erosion control, riparian and floodplain restoration, stormwater infrastructure improvements, and the Mutts for the Bay program to reduce bacteria entering the bay from pet waste. These efforts are informed by watershed-scale planning and water quality monitoring.

Strengthening National Pollutant Discharge Elimination Systems (NPDES) Permits

The MBNEP assists municipalities with Phase II MS4 permit requirements by supporting clean water outreach and public education. The MBNEP delivers messaging on stormwater pollution prevention and responsible watershed behaviors, bolstering compliance with NPDES goals. The MBNEP's monitoring data is shared with the state to potentially support management of NPDES permits.

Supporting Sustainable Wastewater Infrastructure

While the MBNEP does not manage or operate wastewater systems, we support sustainable infrastructure through watershed-scale monitoring and collaborative planning efforts. Our long-term monitoring program includes nutrient tracking, such as nitrate sampling in creeks, which helps assess overall watershed health and can inform local infrastructure needs. The MBNEP collaborates with agencies like the CCRWQCB, LOCSD, City of Morro Bay, and local partners to identify water quality trends and potential concerns.

EPA Priorities

How does the NEP incorporate relevant aspects of the EPA priorities into its workplans consistent with locally generated concerns? *Highlight the best examples of where the NEP has made collective impacts not already identified in previous sections related to CWG 320 (Base) funds or BIL funds. An example does not need to be provided for each priority area listed.*

The MBNEP integrates EPA's Office of Water priorities into its workplans by aligning local concerns and community partnerships with national environmental goals. Through adaptive management, collaborative implementation, and targeted public engagement, the MBNEP leverages its resources and partnerships to make measurable impacts in the following areas:

Reduction in Nutrient Pollution to Protect Water Quality and Public Health

The MBNEP collects nutrient monitoring data from creeks and estuarine waters to support regulatory assessments and inform local management decisions. These data are shared with the CCRWQCB and other agencies to support basin planning and TMDL development and assessment. The MBNEP also partners on research investigating HABs and their potential effects on the estuary ecosystem. To reduce nutrient loading, the MBNEP provides financial and technical support for the implementation of BMPs on agricultural lands, including erosion control and sediment reduction efforts. Public programs like Mutts for the Bay also reduce nutrient and bacterial pollution from pet waste. These combined efforts address pollution at both the source and landscape scale.

Reduce Trash

The MBNEP conducts beach and estuary cleanups, particularly following high-traffic events, to prevent trash from entering the bay. Educational programming for youth and school groups includes marine debris awareness and stewardship activities. The MBNEP also partners with researchers to support microplastics studies in the in the estuary and raises public awareness through signage, reusable marine debris coasters distributed at local bars and coffee shops; and social media. These outreach efforts are reinforced through active volunteer events and partnerships with waste reduction initiatives.

Make Resilience Investments to Address Recurring Extreme Weather Events

The MBNEP continues to invest in watershed and habitat projects that reduce the risks of flooding, erosion, and drought while supporting long-term ecosystem health. Restoration planning and implementation efforts, such as the Pennington Creek rainwater catchment project, are designed to reduce dry-season water stress by storing wet-season flows. Stormwater infrastructure improvements have also been implemented to protect habitats and downstream water quality. The MBNEP has prioritized monitoring at critical restoration sites such as CCER following extreme flood events to inform adaptive management and assess the resilience of floodplain reconnection projects.

In addition to on-the-ground actions, the MBNEP supports forward-looking planning and research to guide future projects. The program is collaborating with the USGS to model salt marsh habitat changes due to rising water levels, providing insight into potential future scenarios and informing tidal wetland protection. The MBNEP is also partnering with the CSLRCD and the SLOCOG on regional vulnerability and adaptation assessments focused on flooding impacts to critical transportation corridors and vulnerable communities. These efforts are supported by expanded monitoring and planning frameworks, such as the HPRS, which identifies habitat stressors and outlines measurable goals to guide future resilience investment.

Engage All Communities

The MBNEP ensures inclusive engagement by partnering with inland schools and organizations to connect diverse student populations with the estuary. Over the past few years, the MBNEP has reached more than 10,000 students through school field trips, classroom visits, and collaborative efforts with groups like One Cool Earth, Camp Ocean Pines, Camp KEEP, and Creek Lands Conservation.

Public engagement is further enhanced through targeted outreach in English and in other languages, local business partnerships, participation in festivals and community events, and interactive public programming such as Science on Tap and Science Exploration events. These initiatives help connect residents and visitors alike to estuary health and stewardship opportunities.

Acronyms

Acronym	Explanation
ACOE	Army Corps of Engineers
BMP	Best management practice
Cal Poly	California Polytechnic State University, San Luis Obispo
Caltrans	California Department of Transportation
Camp SLO	Army National Guard Base Camp San Luis Obispo
CCC	California Conservation Corps
CCER	Chorro Creek Ecological Reserve
CCMP	Comprehensive Conservation and Management Plan
CCRWQCB	Central Coast Regional Water Quality Control Board
CDFW	California Department of Fish and Wildlife
CDPH	California Department of Public Health
CEDEN	California Environmental Data Exchange Network
CeNCOOS	Central & Northern California Ocean Observing System
CMC	California Men's Colony Prison
CSLRCD	Coastal San Luis Resource Conservation District
CWA	Clean Water Act, the enabling legislation for the National Estuary Program
EC	Executive Committee
eDNA	Environmental DNA
EPA	Environmental Protection Agency
FY	Fiscal Year
IIJA	Infrastructure Investment and Jobs Act
HAB	Harmful Algal Bloom
HPRS	Habitat Protection & Restoration Strategy

Acronym	Explanation
LCSLO	The Land Conservancy of San Luis Obispo County
LOBMC	Los Osos Basin Management Committee
LOCSD	Los Osos Community Services District
MBNEP	Morro Bay National Estuary Program
MCAS	Morro Coast Audubon Society
NEP	National Estuary Program
NEPORT	National Estuary Program Online Report Tool
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	Non-Point Source
NRCS	Natural Resources Conservation Science
OPC	Ocean Protection Council
PE	Program Evaluation
PIT	Passive Integrated Transponder
QAPP	Quality Assurance Project Plan
SCC	State Coastal Conservancy
SFEI	San Francisco Estuary Institute
SLO	San Luis Obispo
SWRCB	State Water Resources Control Board
TAC	Technical Advisory Committees
TMDL	Total Maximum Daily Loads
UCSB	University of California, Santa Barbara
USFWS	United States Fish & Wildlife Service
USGS	United States Geological Survey
VMP	Volunteer Monitoring Program
WCB	Wildlife Conservation Board