Habitat Protection and Restoration Strategy Summary

The Morro Bay National Estuary Program (MBNEP) works to protect and restore the Morro Bay estuary and watershed for people and wildlife. The MBNEP is a collaborative, non-regulatory, nonprofit organization that brings community members, local governments, nonprofit organizations, state and federal agencies, and landowners together to support a healthy environment and vibrant local communities.

This Habitat Protection and Restoration Strategy ('habitat strategy') was developed to guide protection, restoration, research, monitoring, educational, and resiliency efforts in the face of climate change throughout the Morro Bay estuary and watershed. It is intended to provide measurable objectives and targets to inform future management planning and projects within the Morro Bay watershed, including MBNEP's next Comprehensive Conservation & Management Plan (CCMP) update. The strategy describes the health, extent, and key species within the Morro Bay watershed's habitats and connect habitats to the following:

- 2022 CCMP Action Plans
- Past and current protection and restoration efforts
- Stressors and climate vulnerabilities from the 2021 Climate Vulnerability Assessment
- Measurable objectives and targets for the next five to ten years
- Ongoing and potential projects to achieve those objectives
- Climate resiliency

Climate Change Vulnerabilities

This habitat strategy focuses on the likely impacts from climate change stressors in the Morro Bay area from the MBNEP 2021 Climate Vulnerability Assessment (CVA). The CVA found that the Morro Bay area is expected to have the following changes that could create new environmental stressors and/or exacerbate existing vulnerabilities:

- Increasing Storminess
- Warmer Annual Temperatures
- Increasing Droughts
- Sea Level Rise
- Ocean Acidification

Habitat Mapping Analysis

The habitat strategy includes mapping analysis based on existing vegetation data of Morro Bay watershed habitats. Habitat types and areas were determined from existing MBNEP documents, the Atlas of Sensitive Species (Sims, 2010), and from similar documents from other National Estuary Programs. The watershed is broken up into five habitat areas and 15 habitat types (Table 1). Each habitat was mapped using existing data (San Luis Obispo County, 2013 and Sims, 2010) to determine acreage extent and distribution throughout the watershed (Figure 1).

Table 1. Habitat areas and habitat types of Morro Bay Watershed

Habitat Areas	Habitat Types
Estuarine	Estuary (Open Water and Subtidal Channels, Eelgrass Beds, and Mudflats)
	Salt Marsh
Freshwater	Riparian and In-Stream
	Freshwater Wetlands
Sandy Shores	Beaches
	Coastal Dunes (Foredunes and Backdunes)
Upland	Coast Oak Woodlands
	Maritime Chaparral
	Coastal Scrub
	Grasslands
	Other Chaparral and Scrub
	Other Habitats (Serpentine Outcrops and Soils, Dacite Outcrops, Sargent's cypress, Non-Native Woodlands: Monterey pine/cypress and Eucalyptus)
Urban Development and Irrigated Agricultural	Urban
	Irrigated Agricultural

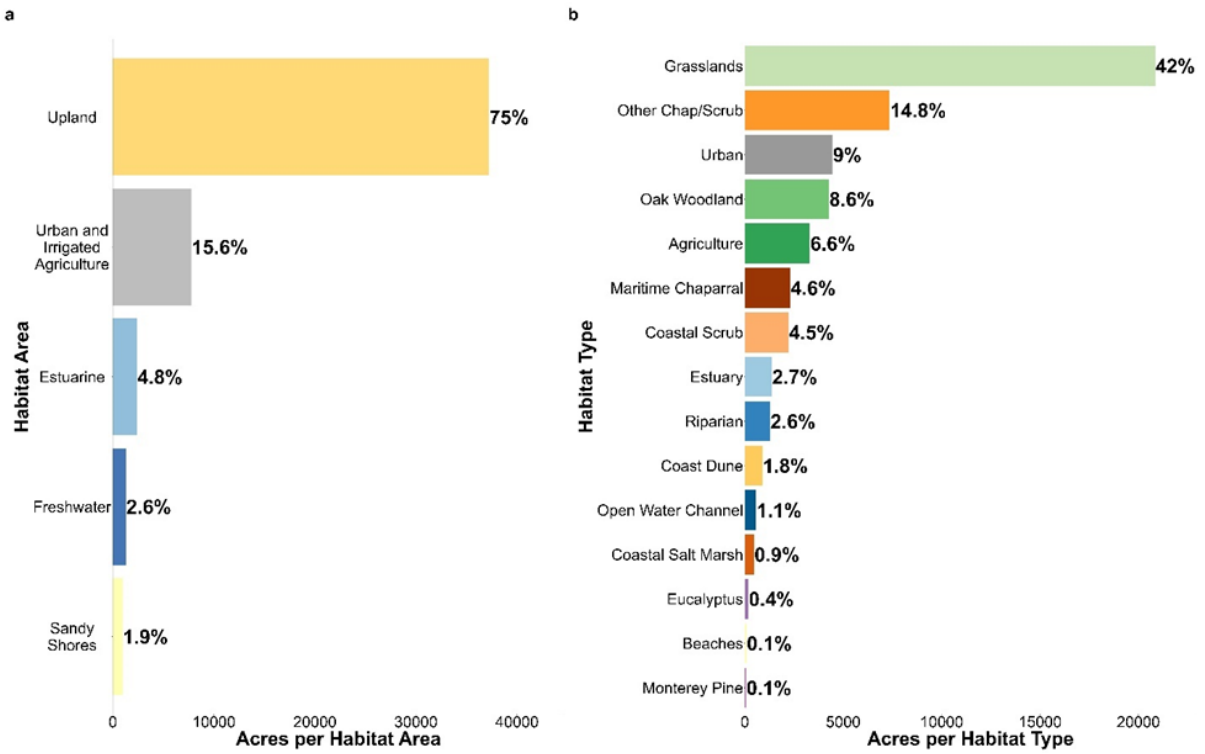

Figure 1. Acres and overall percentage of total watershed acreage within the Morro Bay watershed for each (a) habitat area and (b) habitat type.

Habitat Area Objectives and Projects

The habitat strategy focuses on five habitat areas for objectives and projects. For each habitat area, two examples of a higher-level objectives and projects to meet objectives are highlighted below:

Habitat Area	Objectives	Ongoing/Potential Projects
Estuarine	Understand and maintain the mosaic of functioning estuarine habitats with the impacts of climate change and sea level rise.	**Habitat Sea Level Rise Modeling:** Support SLR modeling of estuarine habitats and transition zones to identify vulnerable areas and create adaptive management actions.
	Monitor and support research to track eelgrass health and extent over time.	**Eelgrass Mapping:** Continue eelgrass mapping, typically on a biennial basis. If eelgrass coverage falls below 313 acres within a depth range of -6 ft to 1.5 ft mean high tide, consider re-initiating restoration measures.

Habitat Area	Objectives	Ongoing/Potential Projects
Freshwater	Monitor ambient conditions, implement projects, and track project effectiveness to promote and enhance healthy in-stream, riparian, and freshwater wetland habitat.	**Water Quality Monitoring:** Continue long-term ambient monitoring dataset to track water quality and habitat health with MBNEP staff, MBNEP's Volunteer Monitoring Program, and partners.
	Monitor, enhance, and restore native riparian, in-stream, and floodplain connectivity and conditions to improve habitat for native biodiversity and special status species.	**Fish Passage Barrier Removal:** Support planning and implementation of fish passage barrier improvements and removal for special status species.
Sandy Shores	Support and enhance dune ecosystem function and resilience through restoration efforts.	**Invasive Species Management:** Work with partners to implement removal efforts on City of Morro Bay's sandspit property and conduct vegetation monitoring during restoration (annually for five years).
	Support and promote environmental stewardship to reduce direct and indirect human impacts.	**Community Cleanups:** Conduct beach cleanups at high-use areas on a biannual basis to increase education on sandy shores habitat and reduce trash pollution.
Upland	Maintain and enhance a healthy diversity of upland habitats including oak woodland, maritime chaparral, coastal scrub, and native grassland through habitat protection and restoration.	**Land Protection:** Continued work with partners in the watershed, including private property owners, to maintain current upland habitat through public ownership or conservation easements.
	Support projects and planning efforts that conserve or enhance special status habitats and species, increase habitat connectivity, and improve overall resilience.	**Regional Collaboration:** Participate in and support local and regional efforts to restore and maintain protected species within upland habitats, such as Morro manzanita.

Habitat Area	Objectives	Ongoing/Potential Projects
Urban and Irrigated Agriculture	Improve and maintain partnerships to expand educational programming on watershed health, climate change solutions, special status species, and environmental stewardship within the urban environment.	**Education and Outreach:** Educational programming with partner organizations and schools on watershed health curriculum. This includes creating targeted curriculum and activities to address urban impacts on watershed health and the estuary.
	Support local partners and landowners to implement and monitor best management practices (BMPs) on agricultural lands, including water conservation and carbon farming projects.	**Agricultural BMPs:** Support implementation by the CSLRCD and Natural Resources Conservation Service (NRCS) to improve water conservation and climate resiliency practices.

Conclusion: The MBNEP and its partners aim to improve climate resiliency for the Morro Bay watershed habitats and interconnected coastal communities through the implementation of this strategy.