

Chapter 7 Land Use Goals, Objectives and Actions

Themes

- The Barnegat Bay watershed has experienced intense growth and development over the last half century.
- With more than 33% of the watershed being developed to date, the sustainability of ecosystem services and the bay's biotic resources is increasingly at risk.
(https://www.nj.gov/dep/gis/digidownload/images/lulc12/Land_lu_2012_hu02040301.gif)
- Sustaining the health, diversity and economic importance of the watershed's natural resources while managing development is a shared responsibility between local, county, regional and state land-use managers.
- Climate change and sea level rise increasingly threaten the sustainability and resilience of the watershed's natural resources, built communities, citizens and economy.

7.1 Goal

To improve protection of open space throughout the watershed, and to develop collaborative regional approaches to responsible land use and resilient communities that protect and improve water quality, water supply, living resources, soil function and hydrology.

Land Use Objectives:

1. Promote and support open-space acquisition, planning, and management for people and nature;
2. Promote and support sustainable land use and related practices (*e.g.*, soil restoration, low-impact development, shoreline restoration, dredged material management) to increase resiliency of vulnerable communities and support other BBP CCMP priorities (*e.g.*, water quality and supplies, living resources);
3. Incorporate CCMP goals and objectives into regional, county, municipal and other policies, plans, and regulations; moreover, promote and support short and long-term planning (*e.g.*, hazard assessment and mitigation, development of new land-use planning element, zoning, transfer of development rights) to promote "visioning and transitioning" of vulnerable communities;

4. Assess status and trends in land uses, land cover, and landscapes, especially those directly impacted by climate change and sea level rise (*e.g.*, inundated and regularly flooded lands); improve understanding of the impacts of land uses and land management practices on the Barnegat Bay and its watershed; and
5. Increase education and outreach efforts focused on: a) promoting land acquisition, protection, and management; b) implementing sustainable land use practices across both developed and undeveloped landscapes; c) integrating CCMP priorities into regional, state, local, and municipal planning, and d) reducing land-use impacts on natural resources throughout the watershed.

7.2 Introduction

While New Jersey has a history of strong environmental regulations¹, development in coastal counties has resulted in extensive losses of forests, agricultural lands, freshwater and tidal wetlands, and their dependent biotic resources, and has contributed to other significant adverse impacts (*e.g.*, habitat fragmentation, losses and changes in ecosystem service, chemical contamination). Between 1972 and 1995 (TPL), approximately 33,853 acres (20%) of upland Pine Barrens habitats were developed, more than at any other time in New Jersey's history. During the same timeframe, approximately 6% (4,633 acres) of wetlands in the Barnegat Bay watershed were lost as well (TPL). In recognition of these losses, local planning and zoning regulations were developed to slow the loss of natural lands. However, losses and other anthropogenic impacts to natural lands have continued throughout the coastal zone, including the Barnegat Bay watershed, as the human population continued to grow.

Changes in land use and land cover are among the most important drivers of water quality in, and the integrity and resilience of, the entire watershed. Development of natural lands negatively impacts water quality, water supply, the quality and connectivity of wildlife habitats, and affects the character of the watershed and the quality of life of its residents. In addition, climate change and sea level rise are also likely to affect the landscape directly (*e.g.*, inundation of low-lying areas by sea level rise, higher tides, storm surge) and indirectly (*e.g.*, relocation of vulnerable infrastructure, installation of gray and green infrastructure to mitigate risks).

Challenged by the intense development and volume of people, the shared resources of the Barnegat Bay watershed require collaboration amongst those agencies with management responsibility and authority. Unfortunately, environmental protection and community resilience to climate change and sea level rise need to be more strongly integrated into local community planning and economic development. Careful planning, stewardship, and sound and

¹ Freshwater Wetlands Protection Act: N.J.S.A. 13:9B, first enacted July 1987, implementing rules at N.J.A.C. 7:7A; Wetlands Act of 1970: N.J.S.A. 13:9A, first enacted 1970 (obvs) CZM Rules at N.J.A.C. 7:7

collaborative decision making at all levels of government will balance sustainable economic growth, natural resource protection, and community resilience and will maintain the quality of life in the Barnegat Bay Estuary watershed.

The priority land use actions of the Barnegat Bay CCMP build on previous successes (*e.g.*, land acquisition) and make use of existing tools, plans, programs and efforts; but more importantly, they require greater collaboration across all levels of government to develop, adopt, and implement, new policies, plans and strategies that not only conserve, restore and enhance natural resources but also lead to more resilient communities. This section addresses the challenges related to land use management, development, and sustainability in the Barnegat Bay watershed by:

- Promoting the collective integration of environmental protection, economic development and resiliency through sustainable approaches to local community planning, decision-making and development;
- Focusing on cross-jurisdictional collaboration by using the strengths of each municipality and agency to support initiatives, share experiences and knowledge, and take advantage of economies of scale;
- Ensuring that decision-making is informed by sound science and current data; and
- Promoting innovative strategies and sustainable land use practices to maintain natural resources and ecosystem services to ensure communities are resilient to sea level rise and climate change.

Status and Trends – Land Use/Land Cover



Changes in land use can have dramatic and far reaching impacts on the environment. The conversion of natural lands into urban settings directly reduces the amount of habitat available for plant and animal species not adapted to living near humans. Urbanization has continued to increase throughout the watershed, from approximately 22% of the watershed in 1986 to approximately 32% in 2012. As of 2012, urban land use occupied approximately 110,665 acres of the Barnegat Bay watershed, excluding water. Including all altered land uses (i.e.,

Status and Trends – Protected Areas



Protecting open space is extremely important, especially in areas where development is occurring in a rapid manner. Fortunately, Ocean and Monmouth Counties, and a number of federal, state, government and non-governmental organizations have made land conservation a priority. Between January 1, 2010 and September 30, 2015, approximately 11,114 acres in the Barnegat Bay watershed were acquired by federal, state, county, local, and non-governmental agencies for conservation purposes. These purchases bring the total acreage of publicly owned land in the

Status and Trends – Shoreline Hardening

Approximately 45% of the bay’s shoreline has been hardened or bulk headed. While hardened shorelines do provide some protection to residential and commercial properties, these structures have a significant cost to construct and can exacerbate the impact of storm surge. This loss of habitat has had a negative impact on many biological functions and diversity, and may promote the spread of some nuisance species (e.g., the bay nettle, *Chrysaora chesapeakei*) throughout the bay.

Shoreline hardening has not been one of the BBP’s indicators of healthy and integrity of the bay, however many

7.3 Objectives

Priority objectives in the land use section are designed to be complimentary and supportive of other BBP priorities. Objectives and actions herein expand on previous efforts to acquire, protect, and better manage open space. They support improved intergovernmental and public-private communication and coordination to integrate all CCMP goals and objectives into other regional and local planning and related activities. We also seek to promote and implement a variety of best management practices (*e.g.*, shoreline, buffers, and soil health) to reduce our individual and collective impacts on water quality and water supply.

It's been nearly a decade since Superstorm Sandy; while we have rebuilt most of the damaged infrastructure, homes, and workplaces, we remain collectively anxious of the next storm. We seek to promote and support comprehensive planning and coordination to develop a vision and transition plan for the most vulnerable coastal neighborhoods and communities. We strive to base all decision-making on the best available science, we will continue our efforts to monitor and assess the changes across the Barnegat Bay landscape and educate everyone on how they can reduce their impacts on the bay and its natural resources.

Land Use Objective 1. Promote and support open-space acquisition, planning, and management for people and nature.

Acquisition and protection of open space have a history of strong support in New Jersey and especially in the Barnegat Bay watershed. Celebrating its 80th anniversary in 2019, the USFWS Edwin B. Forsythe National Wildlife Refuge now includes more than 22,000 acres in two refuge complexes (Barnegat and Brigantine) lying all or in part within Ocean County. Since the 1960s, acquisitions by the NJDEP's Department of Parks and Forestry, Division of Fish and Wildlife, Green Acres Program have protected some of the most iconic landscapes within New Jersey (*e.g.*, Double Trouble State Park, Island Beach State Park, Barnegat Light State Park). In 1997, Ocean County residents overwhelmingly voted to establish the Ocean County Natural Lands Trust (OCNLT) Program to establish of a system of protected lands which help maintain the county's rural characteristics, protect its critical environmental resources and water supplies, and buffer areas that are not compatible with development (*e.g.*, military bases, power plants). The OCNLT now generates more than \$10 million annually and has protected over 10,000 acres.

Properties acquired by the OCNLT

(<http://www.planning.co.ocean.nj.us/frmEPNaturalLandTrust>) are maintained by the Ocean County Parks and Recreation Department (<http://www.oceancountyparks.org/>). The Monmouth County Board of Chosen Freeholders established an Open Space Trust Fund in 1987. Under that fund, the Freeholders allocated \$2 million for their Municipal Open Space Grant Program. In

2018 Millstone Township was awarded a \$180,000 grant to help fund the acquisition of the new Barnegat Bay Conservation Area.

A number of nongovernmental organizations, most notably the Trust for Public Land (TPL), have promoted land acquisition and provided other assistance to open space acquisition. TPL's 1995 *Century Plan* (<https://www.tpl.org/sites/default/files/cloud.tpl.org/pubs/local-nj-century-plan-report.pdf>) identified and prioritized 100 unique conservation and public access sites and contributed to the acquisition of more than 24,000 acres throughout the Barnegat Bay watershed. That successful effort was followed up by the TPL's 2008 *Barnegat Bay 2020 Report* (<https://www.tpl.org/sites/default/files/cloud.tpl.org/pubs/local-nj-barnegat-bay-2020.pdf>), which pulled together numerous public and private entities with diverse expertise to identify and prioritize parcels for acquisition.

Acquisition of open space to date has provided diverse environmental, recreational and other opportunities. As development and population growth continue, and climate change and sea level rise continue to impact portions of the landscape throughout Ocean County, partners must coordinate to strengthen identification and acquisition of parcels that may address several new priorities. For example, open space can be utilized to counter the effects of urban heat islands². After Superstorm Sandy, NJDEP expanded the Blue Acres Program to acquire flood-prone properties in the State of New Jersey and to dedicate those lands that are purchased for recreation and conservation purposes. Once restored as open space, those Blue Acres properties can serve as 'sponge parks' to retain and dissipate flood waters and possibly even to provide areas for wetland migration. Over time, these acquisitions reduce the risks and the costs of damages that would result from any future flooding. Forested areas acquired in the past and the future will likely have to be increasingly managed, as such open areas face new threats from climate change (e.g., southern pine beetle) and a continuing human threat from illegal off-road vehicle use, both of which increase the risks of forest fires. While open space acquisition and conservation will remain a major component of land use planning and management in New Jersey, actions recommended in this plan emphasize a greater role in planning to increase the resilience of coastal communities, such as storm surge protection and flood reduction, and to address other climate change impacts.

Land Use Objective 2. Promote and support sustainable land use and related practices (e.g., soil restoration, low-impact development, shoreline restoration, dredged material management) to increase resiliency of vulnerable communities and support other BBP CCMP priorities (e.g., water quality and supplies, living resources)

² urban heat islands =built up areas that are hotter than nearby rural areas

While many beach-front and other communities have largely recovered from the damages caused by Superstorm Sandy, a number of back-bay communities have been slower to recover and exhibit more uncertainty in redevelopment and long-term sustainability. In low-lying and highly exposed parts of these neighborhoods, tidal and storm-related flooding will likely increase, with increasingly higher costs and risks in the future as sea level continues to rise. Thus, promoting and supporting projects (*e.g.*, nature-based shorelines, other green infrastructure and nature-based solutions) may improve quality of life in these neighborhoods for some period of time. One important aspect of this effort is to collaborate across levels of government to vet and incorporate such projects into various planning efforts (*e.g.*, Municipal Floodplain Management Plans, FEMA's Natural Disaster Recovery Framework), which currently makes available various federal funding sources for project planning and implementation. In addition, to "scale-up" some projects (*e.g.*, shorelines) to a magnitude sufficient to have a broad positive impact throughout the Bay may require development of other ancillary planning/other activities. For example, shoreline and marsh restoration projects may require development of programs which plan and manage large volumes of materials (sands, muds, shell) not presently available throughout shallow back-bay landscapes (see also Living Resource Section 6.2 regarding wetlands)

Sea level rise, shoreline erosion, development pressure, and recent and future storm will also have a direct impact on the character of water-dependent facilities along the Barnegat Bay shoreline. Historically, the Barnegat Bay watershed was known for its fishing, shellfisheries, hunting, trapping, waterfowl, birding and boating activities; many of the activities contribute to the current tourism economy and improve the quality of life of many residents. The stressors mentioned have resulted in the loss of waterfront services which have historically supported these activities. Sometimes water-dependent services were incompatible with subsequent encroaching development or were severely impacted by storm events and were converted to non-water dependent uses. Retaining water-dependent land uses is critical to maintaining the character of the Barnegat Bay, providing public access, retaining a commercial and recreation driver of the economy and providing opportunities for implementing adaptation strategies to enhance shorelines.

Land Use Objective 3. Incorporate CCMP goals and objectives into regional, county, municipal and other policies, plans, and regulations; moreover, promote and support short and long-term planning (*e.g.*, hazard assessment and mitigation, development of new land-use planning element, zoning, transfer of development rights) to promote "visioning and transitioning" of vulnerable communities.

Land uses affect water quality, water supplies, and the quality and connectivity of wildlife habitats, as well as the character of the watershed and the quality of life in coastal communities. The BBP CCMP includes numerous goals, objectives, and actions which were developed by its

partners drawn from all levels of government, academic institutions, non-governmental organizations and other entities. To achieve sustainability and resilience throughout the Barnegat Bay watershed, the 37 municipalities, 2 counties, numerous state agencies and other decision makers must work together consistently toward CCMP goals and objectives. Recognition of CCMP objectives and actions, and incorporation of various CCMP elements into municipal, county, and other local planning activities makes available some significant funding streams (*e.g.*, State Revolving Funds) to protect and improve water quality and enhance community resilience to climate change and sea level rise.

As an example, future predicted changes in land use must also be considered. Lakewood is the fastest growing municipality in the state and is anticipated to become the third largest city in the state by 2030. Lakewood's growth, together with climate change and sea level rise, has already placed some strains on water supplies for people (thus requiring close attention of water supplies by the Brick Twp. MUA). These issues also have the potential to have downstream impacts on groundwater-driven base water flows to the Metedeconk River and thus the bay. Headwater areas of the Metedeconk and Toms rivers are situated in the state's most critical water supply planning areas.

Land Use Objective 4. Assess status and trends in land uses, land cover, and landscapes, especially those directly impacted by climate change and sea level rise (e.g., inundated and regularly flooded lands); improve understanding of the impacts of land uses and land management practices on the Barnegat Bay and its watershed.

The BBP recognizes the importance of sound science to land-use decision making and management. Future decision making must include: 1) recognition of changing land use and land cover in response to dynamic development and economic pressures and 2) recognition and accommodations for climate change, to be responsive to protecting biotic resources and the social and economic needs of communities. The studies identified in this section are important to help inform land use decision-makers in achieving progress towards the goals and objectives of maintaining sustainable and resilient communities and natural resources within the watershed. The priority land use objectives and actions focus on establishing a collaborative, science-based approach at all levels of government to protect and enhance water quality and other resources upon which our economy and quality of life depend, and to make our communities more resilient to future climate change, including sea level rise.

Land Use Objective 5. Increase education and outreach efforts focused on: a) promoting land acquisition, protection, and management; b) implementing sustainable land use practices across both developed and undeveloped landscapes; c) integrating CCMP

priorities into regional, state, local, and municipal planning, and d) reducing land-use impacts on natural resources throughout the watershed.

Land use managers (including municipalities, counties, regional agencies, developers) and citizens need assistance in acquiring, translating and applying the best available science to develop and implement strategies and practices that support healthy natural resources, ecosystem services and balance the impacts of development in the Barnegat Bay watershed. Increased education and outreach of land use practices will help communities prepare for climate change impacts and resulting cultural, economic and ecological changes/disruptions.

For example, BBP plans to implement several new/updated education and outreach programs aimed at increasing understanding of the CCMP and its implementation. A series of workshops and educational materials will be developed to educate various audiences about topics including sustainable land use practices, climate change and sea level rise, habitat protection, and



Figure 7.1 – Potter Creek Crusader at a site preserved by Ocean County Natural Lands Trust

sustainable land management. A recognition program will also be developed to award communities who have demonstrated a commitment to supporting CCMP implementation.

7.4 Objectives and Actions for Land Use Planning in the Barnegat Bay Watershed

Objective 1 Promote and support open space acquisition, planning and management for people and nature.

- **LU 1-1:** Convene intergovernmental working group to review all existing public and private planning documents (such as Green Acres Inventory, County and Municipal Open Space Inventories, TPL 2020 Plan, municipal master plans, CIPs, and All Hazard Mitigation Plans, Conservation Blue Print initiative) and holdings, in order to coordinate future efforts to maximize ecological services of preserved lands.
- **LU 1-2:** Compile a comprehensive inventory of open space and lands held in permanent and temporary easements
- **LU 1-3:** Promote acquisition and management of lands to achieve: 1) community resilience, 2) natural resource protection, 3) water supply protection, 4) diverse recreational opportunities (incl handicapped access) , 5) promotion/education regarding cultural heritage.
- **LU 1-4:** Promote the expansion of riparian buffers through available mechanisms to protect ecologically vulnerable habitats and improve water quality and to promote and pursue opportunities for green/blue acres acquisitions in buffer areas and floodplains.
- **LU 1-5:** Promote acquisition and management of lands towards achieving community and natural resource protection and resilience and a landscape that supports recreation and the cultural heritage of the Barnegat Bay through implementation of current and future watershed-wide open space plans.
- **LU 1-6:** Promote the expansion of the NJDEP Environmentally Sensitive Areas Plan
- **LU 1-7:** Conserve and enhance forestry areas with multiple ecosystem benefits

Objective 2 Promote and support sustainable land use and related practices (e.g., soil restoration, low-impact development, shoreline restoration, dredged material management) to increase resiliency of vulnerable communities and support other BBP CCMP priorities (e.g., water quality and supplies, living resources)

- **LU 2-1:** Support and encourage land use practices that incorporate BMPs such as Low Impact Development (LID) and Sustainable Jersey actions; these practices should minimize soil disturbance, minimize forest and wetland loss, protect soil integrity recharge, and promote nature-based infrastructure.
- **LU 2-2:** Support the development of localized and/or regional adaptation plans for vulnerable, low-lying communities (e.g. communities experiencing repetitive losses).
- **LU 2-3:** Promote innovative zoning and land use management techniques such as: transfer of development rights (TDR), rolling easements, acquisition (fee simple and easements), buy-outs, strategic retreat, non-contiguous density transfer, center-based development and septic density.

- **LU 2-4:** Provide landowners with existing information and modeling tools that identify hazard vulnerability, adaptation and response actions
- **LU 2-5:** Promote land use practices that recognize and prioritize water-dependent uses; Ensure that authorized waterfront uses are compatible with supporting commercial and recreational activities.

Objective 3 Incorporate CCMP goals and objectives into regional, county, municipal and other policies, plans, and regulations; moreover, promote and support short and long-term planning (e.g., hazard assessment and mitigation, development of new land-use planning element, zoning, transfer of development rights) to promote “visioning and transitioning” of vulnerable communities.

- **LU 3-1:** Align and expand existing municipal plans, BMPs, incentive programs and other related planning tools (e.g. Ocean and Monmouth Counties All-Hazards Mitigation Plan, GTR and Sustainable Jersey).
- **LU 3-2:** Coordinate with municipal, county, regional) and state planning representatives to develop a Land Use Element (including Working Waterfronts, Regional Resilience, Restoration and Enhancement activities/targets) for inclusion in their planning documents.
- **LU 3-3:** Identify regulatory gaps and overlaps and promote planning tools (such as draft ordinances, policies and model language) that support sustainable land use development practices

Objective 4 Assess status and trends in land uses, land cover, and landscapes, especially those directly impacted by climate change and sea level rise (e.g., inundated and regularly flooded lands); improve understanding of the impacts of land uses and land management practices on the Barnegat Bay and its watershed.

- **LU 4-1:** Identify the social, economic and environmental impediments and solutions for implementing sustainable land use practices on existing and future private developments – including green and gray infrastructure strategies in relation to SLR and climate change, repetitive losses and ‘Willingness to Pay’ and contingent valuation studies.
- **LU 4-2:** Support the development of an updated Land Use Land Cover Map including analysis of LU/LC Change, analysis of impervious surface; shoreline (land/water interface); V Datum.

Objective 5 Increase education and outreach efforts focused on: a) promoting land acquisition, protection, and management; b) implementing sustainable land use practices across both developed and undeveloped landscapes; c) integrating CCMP priorities into regional, state, local, and municipal planning, and d) reducing land-use impacts on natural resources throughout the watershed.

- **LU 5-1:** Develop a BBP Recognition Award Program (including potential for funding availability-to award recipients) for municipalities who are implementing CCMP Actions and coordinating in the development of the Barnegat Bay -wide Land Use Element.
- **LU 5-2:** Promote comprehensive land use planning and inclusion of CCMP land use goals into local and regional planning documents.

- **LU 5-3:** Develop and coordinate workshops for specific audiences on sustainable land use practices, e.g. low impact development (LID) and soil restoration techniques.
- **LU 5-4:** Disseminate information and provide workshops that help watershed communities plan and prepare for climate change/sea-level rise.
- **LU 5-5:** Maintain and expand the Jersey-Friendly Yards website as a comprehensive source of information about sustainable landscaping practices for watershed property owners.
- **LU 5-6:** Promote the understanding of the ecosystem services and economic value of wetlands and other natural habitats

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