

**Barnegat Bay Partnership  
FINAL 2012-2016 Strategic Plan  
(Includes List of Acronyms as Appendix A)**

**The Barnegat Bay Partnership's Vision for the Barnegat Bay Ecosystem**

A thriving Barnegat Bay ecosystem is important to the environmental, cultural, and economic well-being of people who live near, work in, and enjoy the bay. The Barnegat Bay Partnership (BBP) is committed to protecting, restoring, and enhancing the Barnegat Bay ecosystem and to advancing the sustainable use of its natural resources. The BBP also recognizes the need to increase focus on emerging issues and to promote understanding of the value of functioning natural systems to our economy and quality of life.

First and foremost, the BBP coordinates and supports partnerships with federal, state, and local government agencies, academic institutions, non-governmental organizations, and other stakeholders to improve water quality throughout the entire watershed, including the associated tributaries of the Barnegat Bay estuary, as defined by Section 320 of the Clean Water Act (33 U.S.C. 1330, as amended by P.L. 100-4).

The BBP also works with its public and private partners to:

- Promote the sustainable use of the Barnegat Bay watershed, its biota, and other natural resources;
- Support sound science, monitoring, management, planning, and related decision-making to protect the Barnegat Bay watershed and its resources;
- Encourage community-based approaches to land use planning and other protective and restorative efforts to reduce impacts to natural resources;
- Assist in proactive efforts to secure support for Barnegat Bay programs and to respond to the emerging issues and dynamic processes that will impact the bay and surrounding watershed;
- **Increase education and public awareness of the watershed's natural resources, the ecological services they provide, and their importance to our economy, and promote recognition of the impacts of human activities;** and
- Promote participation of diverse (including underserved) communities in stewardship efforts while providing effective regional and statewide leadership for a healthy watershed.

**Priorities for the Five-Year Period (2012-2016)**

To build upon the previous commitments of its Comprehensive Conservation and Management Plan (CCMP), the BBP has identified the following Priority Areas for the coming five years. For each Priority Area, the BBP has established Long-term, Intermediate, and Short-term

Environmental Outcomes, as well as key Objectives for achieving these outcomes. In each Priority Area, the partners have committed to specific Actions and Deliverables for the five-year period. In recognition of our changing climate, including sea level rise and other dynamic processes in the bay, the BBP will promote an ecosystem-based management approach to increase overall understanding while working to address the following Priority Areas:

- Water Quality: to improve water quality throughout Barnegat Bay by focusing on causes of water quality degradation, especially eutrophication, stormwater, and other sources of pollution;
- Water Supply: to ensure adequate water supplies and water flow for ecological and human uses that will support a sustainable watershed;
- Habitat: to protect, restore, and enhance habitats, especially submerged aquatic vegetation, marshes, shellfish, and large terrestrial tracts;
- Fisheries and Wildlife: to protect, restore and enhance healthy populations of finfishes, shellfishes, and other wildlife by increasing our understanding of the dynamics of fish communities and other biota; and
- Land Use: to identify and promote: (1) holistic and collaborative approaches to land-use planning, and (2) practices that will improve soil function and hydrology and will restore and enhance water quality and quantity.

## WATER QUALITY PRIORITY AREA

**Strategic Objective:** To improve the water quality throughout the Barnegat Bay ecosystem by engaging in actions that target the causes of water quality degradation, including the reduction of eutrophication, stormwater and other non-point source pollution.

### **Environmental Outcomes:**

#### *Long term:*

- 1) Water quality that supports healthy populations of finfish, shellfish, and SAV, and that sustains historically important recreation, including swimming, fishing, and other designated uses.

#### *Intermediate:*

- 2) Identification and reduction of nutrient, pathogen, litter, and toxin sources.
- 3) Reduction in the number of impaired waterways.

#### *Short-term:*

- 4) Identify water-body impairments.
- 5) Improved stormwater management to reduce nutrient, litter, and other loadings.
- 6) Improved understanding of circulation patterns in the estuary and their relationship to contaminants, sediments, distribution of water quality constituents, bottom characteristics, and biological conditions.
- 7) Development and establishment of a long-term, comprehensive monitoring plan with agreed-upon estuarine bio-indicators.
- 8) **Increased public education of bay water-quality conditions and outreach to improve best management practices and stewardship.**

	Water Quality Objectives	Actions	Deliverables	Partners and Leads	Environmental Outcomes Supported	Secured/Potential Funding
WQ1	<b>Watershed Plan Development and Implementation:</b>  Support the development and implementation of 3 watershed restoration and protection plans throughout the BB watershed by 2016.	<u>WQ1A:</u> Implementation of existing management plans (e.g., Lake Carasaljo, Long Swamp Creek).	Implementation of Lake Carasaljo and Long Swamp Creek management plan actions.  Review of the status of implemented actions.	NJDEP <sup>1</sup> ; BBP-AC, Toms River Township	1-3	EPA R2, NJDEP
		<u>WQ1B:</u> Support development and implementation of the Metedeconk River Watershed Management Plan (MRWMP).	A completed and approved MRWMP.  Implementation of MRWMP actions.  Review of the status of implemented actions.	BTMUA, WMP Steering Committee, OCSCD	1-3 and 5	BTMUA, NJDEP (319)
		<u>WQ1C:</u> Further develop the CCMP/SP as an approved watershed management plan consistent with state and federal guidelines.	Approved watershed management plan for the Barnegat Bay.	Program Office and NJDEP submit; EPA R2 approve	1-3 and 5	Staff time.
WQ2	<b>Monitoring and Assessment</b>  Conduct monitoring and assessment within BB watershed to identify pollutant sources and other potential remedial strategies.	<u>WQ2A:</u> Continue the Barnegat Bay Ambient Monitoring Project (Action Item 7 of the Governor's Action Plan) that will assess eutrophication and impairments of the Bay and its tributaries, and support model development. Project includes continuous in-situ water quality monitoring, multi-year grab water quality sampling in tributaries and bay events, flow-gage installation and flow monitoring, bathymetric mapping (boat & aerial surveys), and sediment analyses (grain size, physical composition, nutrients, nutrient fluxes, toxics and toxicity).	Data entered into WQDE/STORET and NWIS systems, and made available on websites by NJDEP, USGS-NJ Water Science Center, and/or other partners.  Support and expand real-time monitoring network.	NJDEP, USGS, EPA R2, BBP, Pinelands Commission, Monmouth Univ. UCI, OCUA, Brick Utilities, OCHD, Ocean County Vocational Technical School (MATES)	1-5	NJDEP, USGS, EPA R2, Monmouth University
		<u>WQ2B:</u> Complete ongoing NEIWPCC Study: Develop estuarine	Estuarine benthic indicators developed.	Rutgers & USGS, EPA R2,	1-5	EPA R2 through

<sup>1</sup> First partner denotes lead partner unless noted otherwise. Other listed partners are supporting partners. The CCMP/SP is the Barnegat Bay Partnership Comprehensive Conservation Management Plan and Strategic Plan.

	Water Quality Objectives	Actions	Deliverables	Partners and Leads	Environmental Outcomes Supported	Secured/Potential Funding
		benthic indicators; improve understanding of relations among pollutant inputs, other factors, and biotic conditions.	Completed report on relations among pollutant inputs, other factors, and biotic conditions.	NJDEP, BBP		NEIWPCC
		<u>WQ2C</u> : Develop/revise RFP and implement annual BBP-funded STAC studies consistent with SP priorities.	Completed STAC projects, including final reports and associated project deliverables.	STAC approval, and partner implementation	1-5	BBP, matching funds from participating partners
		<u>WQ2D</u> : Support completion and expansion of source tracking (CCMP 5.2 and 5.14); ensure source information collected is shared and tracked appropriately (e.g., GIS databases).	Completed report on nutrient sources.  Most effective mitigation actions are identified.	No lead. Other partners: NJDEP, EPA R2, BBP-STAC, USGS, Rutgers/JCNERR; MU-UCI, OCPD	1-5	TBD funding needed
		<u>WQ2E</u> : Conduct a water quality study of stormwater basin influent and effluent in a representative number of basins to determine the range of nutrient attenuation capabilities and obtain a quantitative understanding of the effectiveness of stormwater basins in reducing nutrient and sediment loads to the estuary.	Completed report on study.	No lead. Other partners: NJDEP, USGS, OCSCD, OCPD, RU CRSSA and JC NERR, Mosquito Commissions, Monmouth County, PPA	1,5	NJEIT, NJDEP, EPA R2, Ocean County, USGS, others; funding needed
		<u>WQ2F</u> : Conduct research projects funded under Action Item 9 of the Governor's Action Plan:  1. Benthic Invertebrate Community Monitoring & Indicator. Development. 2. Diatom Nutrient Inference Model. 3. Benthic-Pelagic Coupling: Hard Clams as Indicators of Suspended Particulates. 4. Assessment of Fishes & Crabs Responses to Human Alteration of Barnegat Bay. 5. Assessment of the Distribution & Abundance of Stinging Sea Nettles (Jellyfishes). 6. Baseline Characterization of Phytoplankton & Harmful Algal	Completed reports on projects.	NJDEP, Rutgers U., Academy of Natural Sciences in Phil., Rider U., Montclair U., Monmouth U., NOAA	1-4, 6-8	NJDEP

	Water Quality Objectives	Actions	Deliverables	Partners and Leads	Environmental Outcomes Supported	Secured/Potential Funding
		<p>Blooms. 7. Baseline Characterization of Zooplankton. 8. Multi-Trophic Level Modeling.</p> <p>9. Tidal Freshwater &amp; Salt Marsh Wetland Studies of Changing Ecological Function &amp; Adaptation Strategies.</p>				
		<p><u>WQ2G</u>: Address potential future data gaps through additional investigation, possibly including the following to improve the representation of associated processes in water-quality models, if needed:</p> <ol style="list-style-type: none"> <li>1. Evaluate the sub-estuarine groundwater inputs of nutrient loads to document/understand groundwater discharge zones, and the nutrient loads delivered in these zones.</li> <li>2. Evaluate naturally-occurring nitrogen-removal processes, including denitrification and anaerobic ammonium oxidation, in riparian zones, sub-estuarine groundwater discharge zones, and in estuarine sediments.</li> <li>3. Conduct roadway nitrogen deposition study in northern part of bay; include collection of wet-weather deposition data for comparison with south bay station.</li> </ol>	Completed reports on investigations.	Research partners	1,2,4,5	TBD
		<p><u>WQ2H</u>: Establish Oyster Creek Nuclear Generating Station (OCNGS) sub-committee to explore options for development and implementation of a monitoring plan and for possible mitigation options; engage OCNGS owners/operators to participate in BBP.</p>	Established OCNGS sub-committee that includes owners/operators of OCNGS. OCNGS owners/operators participate in BBP STAC and AC.	BBP, OCNGS, other partners	1-3	Exelon, other partners
		<p><u>WQ2I</u>: Develop and apply hydrologic, hydrodynamic, water-quality, eutrophication, and other ecological response models that improve the</p>	Operational models and documentation.  Report documenting	NJDEP, USGS, Rutgers	1,4	NJDEP, USGS

	Water Quality Objectives	Actions	Deliverables	Partners and Leads	Environmental Outcomes Supported	Secured/Potential Funding
		understanding of estuarine circulation patterns, controls, effects on water quality and biotic conditions, and predict effects of management actions on water quality and biota.	model analysis.			
		<u>WQ2J</u> : Use results of monitoring, studies, and research to develop assessment methods for BB.	Assessment method for Barnegat Bay is developed.	NJDEP	1-3	NJDEP
		<u>WQ2K</u> : Pursuant to Section 305(b) & 303(d) of the Clean Water Act, NJDEP to submit assessment reports for EPA R2 approval.	CWA assessment reports.	NJDEP submits report; subsequent EPA R2 approval	1-3	NJDEP, EPA R2
		<u>WQ2L</u> : Select targeted restoration strategies for Barnegat Bay.	Targeted restoration strategies for Barnegat Bay are selected.	NJDEP, OCPD	1-3,8	NJDEP
<b>WQ3</b>	<b>Assess/restore/mitigate stormwater infrastructure</b>  Restore and/or mitigate stormwater infrastructure, including basins, swales, etc. to improve WQ through stormwater management and promote coordination among state, county, municipal and private stormwater basin owners.	<u>WQ3A</u> : Complete SW basin retrofit projects for those basins which receive SRF funding.	Completed SW retrofit projects (currently, 13 basins and 1 rain garden qualify).	NJDEP, NJEIT, BTMUA, RU JC NERR, OCPD, OCSCD, BBP	1,5	NJDEP (319 funds), NJEIT, EPA R2
		<u>WQ3B</u> : Implement and promote stormwater and NPS pilot/demonstration projects using sustainable site design practices, working with local governments, senior villages, institutions of higher education and other partners.	Completed pilot project(s); Ensure coordination with green infrastructure and land use objectives.	BBP, Shore Builders, OCSCD, county and municipal entities, colleges and universities, community groups	1,5	Staff time / base funding
		<u>WQ3C</u> : Complete “willingness to pay” study for other types of improvement projects (as per Gray et al. study). Note: include in Communication Plan.	Expand and complete study.	BBP, Rutgers/JCNER R-SSC, OCPD, OCSCD, NJDEP	1-5	BBP and partner funds
		<u>WQ3D</u> : Develop indicators and standardized protocol for evaluation of stormwater basins and other disturbed lands.	Indicators and Protocols developed.	NJDEP, BBP, OCPD, Rutgers/JCNER R-SSC, OCSCD, PPA	1,5,6	Staff time / base funding
		<u>WQ3E</u> : Promote and assist development of a comprehensive soil restoration procedure.	Review draft procedures in pending Soil Erosion/ Sediment Control Standards; identify next steps.	BBP-STAC, NRCS, NJDA, NJDEP, NJDOT, OCSCD, OCPD,	1,5	NJDOT, NJDA, NJDEP
		<u>WQ3F</u> : Inventory, evaluate, and prioritize SW basins for retrofit or other actions; estimate costs, input	Completed inventory/database of basins, and evaluation	OCPD; NJDEP, OCSCD, NJDOT inventory of its	1,3,6	NJDEP, others (see 3G and 3H)

	Water Quality Objectives	Actions	Deliverables	Partners and Leads	Environmental Outcomes Supported	Secured/Potential Funding
		into database; report on evaluations with promotional campaigns. Evaluations will include soil assessments to ensure that cost-effective approaches are used.	report; coordination of existing/recent efforts a priority.	basins;		
		<u>WQ3G</u> : Based on WQ2E and WQ3E, conduct evaluation report to identify stormwater basin BMPs that reduce pollution and enhance recharge.	Completed list of BMPs for use in retrofit projects, state regulations and state BMP manual.	Rutgers/JC NERR, OCSCD, OCPD, USGS, PPA	1,5	Staff time; BBP with funding from other partner(s)
		<u>WQ3H</u> : Develop and maintain a GIS-based inventory of all stormwater basins and other installed stormwater structures (including BMPs).	Completed GIS-based inventory for diverse purposes, including identification of stormwater mitigation sites.	OCPD, RU JCNERR	1,2,5	Ocean County, NJDEP Section 319 funding
<b>WQ4</b>	<b>Reduce Boating Impacts on Water Quality</b>  Support efforts to address negative impacts to water quality due to boating activities (conducted in continuing coordination with other related efforts, including those of Governor's Action Plan Item 10.).	<u>WQ4A</u> : Promote NJ's Clean Marina program.	Annual roundtable to provide an opportunity for marina owners to learn more about BMPs they can implement to reduce environmental impacts.  Enroll marinas into Clean Marina Program.  Award SJ points for community education and outreach programs.	NJDEP, NJSGC, BBP, MTA/NJ, OCPD, Sustainable Jersey (SJ)	1,6	NJSGC, NJDEP, NOAA
		<u>WQ4B</u> : Promote Ocean County Pump Out program.	Newsletters, web pages, brochures, that support recreational boaters' education on practices to reduce NPS pollution and to use Clean Marinas and pump out boats.	NJSGC, OCPD, NJDEP, BBP, BBP-AC, MTA/NJ	1,6	OCPD, OCUA, BTMUA
		<u>WQ4C</u> : Promote Clean Vessel Program	Support additional public outreach efforts to support Pump Out and Clean Vessel Programs.	NJSGC, NJDEP, BBP, BBP-AC, MTA/NJ, OCPD	1,6	NJSGC, NJDEP, NOAA, EPA R2
		<u>WQ4D</u> : Evaluate the ecology and effectiveness of established	Ecology of established conservation zones is	NJDEP, OCPD, MTA/NJ, Rider U.	1	NJDEP, NOAA,



	Water Quality Objectives	Actions	Deliverables	Partners and Leads	Environmental Outcomes Supported	Secured/Potential Funding
		conservation zones; consider new conservation zones, if proven effective.	evaluated; report(s) completed (Governor's Action Plan: Rider Study).  Consider new zones and alternatives (e.g., enhanced law enforcement)			USFWS, EPA R2, NJDEP, other county and municipal partners
<b>WQ5</b>	<b>Reduce Priority Non-point Source Pollution</b>	<u>WQ5A</u> : Implement fertilizer law, including professional fertilizer certification program (Governor's Action Plan #3).	Online training course developed. Outreach program targeted at homeowners.	NJDEP, Rutgers U., BBP, other partners	1-4,7	BBP, NJDEP, Rutgers, lawn care industry
		<u>WQ5B</u> : Complete and implement Wastewater Management Plan and Water Quality Management Plan.	Finalized plans submitted to NJDEP and approved.	OCUA, OCPD, NJDEP	1-4	OCUA, OCPD
		<u>WQ5C</u> : Adopt and implement the pathogen TMDLs for WMA 13.	Finalized and implemented TMDLs.	NJDEP	1-4,7	NJDEP
		<u>WQ5D</u> : Develop TMDLs for areas on the 303(d) list of impaired waterbodies, to be prioritized by ongoing monitoring, modeling, and research (see WQ2A, WQ2B, WQ2F, WQ2I).	TMDLs are developed and approved.	NJDEP submits TMDLs; EPA R2 reviews & approves	1-4	NJDEP, EPA R2
		<u>WQ5E</u> : As part of NJWPCA/ NJPDES permitting and enforcement programs for wastewater and stormwater discharges, repair identified problems in wastewater and stormwater infrastructure.	Record of repairs made. Improve communication of existing reports (NJDEP, utilities).  Audit of BB activities by EPA R2.	NJDEP, OCPD, OCUA, OCHD, municipalities (municipal utility authorities)	1-4,7	NJDEP, OCUA, municipalities (responsible parties), EPA R2
		<u>WQ5F</u> : Ensure implementation and enforcement of stormwater rules and ordinances at the state, county, and town levels.	Summary report on status and enforcement actions; audit of BB activities by EPA R2.	NJDEP, county, & local regulatory agencies	1-4,7	NJDEP, EPA R2, counties and municipalities
		<u>WQ5G</u> : Ensure enforcement of litter laws.	Summary report of enforcement activities.	Municipalities (law enforcement)	1,2	Local/other LE
		<u>WQ5H</u> : Support Best Management Practices for farm animals and stormwater and soil management in agricultural areas.	Summary Report on X # of people who have farm animals and/or agricultural lands that are in compliance with BMPs.	NJDA, Rutgers Ag, NJ Natl. Ag Statistics Service (NASS), Ocean County Agr. Development Bd	1-4,7	NJDA, Rutgers Ag., NJ NASS

	Water Quality Objectives	Actions	Deliverables	Partners and Leads	Environmental Outcomes Supported	Secured/Potential Funding
		<u>WQ5I</u> : Improve mass transit options.	Increased ridership using mass transit.	Ocean County, NJDOT, NJ Transit, NJTPA	1-3	NJDOT, NJT, OCPD, NJTPA
		<u>WQ5J</u> : Implement EPA's Cross-State Air Pollution Rule and secondary effects air pollution standards for nitrogen oxides.		EPA R2, NJDEP	1-3	EPA R2, NJDEP, funding needed
		<u>WQ5K</u> : Conduct watershed-wide (e.g., Barnegat Bay Blitz) and other cleanups (e.g., bay-concert), with data collection.	Two cleanups per year; SJ points awarded for "significant contributions."	NJDEP, BBP, PPA, Sustainable Jersey, Ocean County, other partners	1,8	All partners
<b>WQ6</b>	<b>Education and Outreach</b>  Support outreach and public education on NPS pollution, including the fertilizer law, proper functions of existing stormwater retention ponds/basins, responsible water use, stormwater rules and ordinances, native species to reduce nutrients, fossil fuel use and atmospheric sources, septic system maintenance and proper boating/marina practices. (Conducted in coordination with other related outreach and education efforts, including those under the Governor's Action Plan #8).	<u>WQ6A</u> : Targeted programs at nurseries, municipalities, colleges, landscaping firms (e.g., certificate programs).	Develop, implement and evaluate programs.	BBP, RCE, Rutgers/JCNERR, NJDEP, MU UCI, PPA	1-3,6	Staff time
		<u>WQ6B</u> : Expand outreach programs, including new resident packages, rain-barrel projects, extreme lawn makeovers, and native/introduced species programs to reduce water use and improve water quality/	Develop, implement and evaluate programs.	NJDEP, RCE, BBP, Rutgers/JCNERR-SSC, OCSCD, USFWS, OCPD, ALS, municipalities, LBI Foundation of the Arts and Sciences, PPA	1,2,6	NJDEP, BBP and RCE Staff time; additional funds for outreach, other materials
		<u>WQ6C</u> : Continue the Stormwater Steering Committee efforts by sponsoring and evaluating events that promote BMPs, promote education, and support JCNERR stormwater training program.	Sponsor and evaluate X# of events.	Rutgers/JCNER R-SSC, BBP, RCE, OCSCD, OCPD	1,3,6	Staff time / base funding; expanded efforts need funding
		<u>WQ6D</u> : Promote Sustainable Jersey; award SJ points for green challenges, community education and outreach programs, etc.	Increased participation in Sustainable Jersey program.	NJDCA, NJDEP, PPA, Sustainable Jersey		DCA, NJDEP

## **WATER SUPPLY PRIORITY AREA**

**Priority:** To ensure adequate water supplies and water flow for ecological and human uses that will support a sustainable *watershed*.

### **Environmental Outcomes:**

#### *Long-term:*

- 1) Ensure adequate natural freshwater flows (both quantity and periodicity) to the bay to support healthy living resources and sustainable human uses.
- 2) Prevent degradation of water supply from saltwater intrusion (sea level rise and/or unsustainable withdrawals) and other sources of contamination.

#### *Intermediate:*

- 3) Implement projects to conserve water supplies and reduce water use in new and existing public and private development, agriculture and industry.
- 4) Improve understanding and management of water supplies.
- 5) Promote stormwater projects and green infrastructure programs and support, enhance and maintain aquifer recharge and sustainability.

#### *Short-term:*

- 6) Promote and support water conservation and appropriate water re-use demonstration projects at public and private facilities (e.g., colleges, government buildings, golf courses).
- 7) **Develop education and outreach campaign to promote residential water conservation, and support public discussions regarding water supplies, water conservation, and related issues (e.g., saltwater intrusion, road-salt run-off, and emerging contaminants such as endocrine disrupters, pharmaceuticals and personal care products).**

	<b>Water Supply Objectives</b>	<b>Actions</b>	<b>Deliverables</b>	<b>Partners and Leads</b>	<b>Environmental Outcomes Supported</b>	<b>Secured/Potential Funding</b>
<b>WS1</b>	<b>Water Supply Planning</b>  Promote water supply planning at the state, county, and watershed level.	<u>WS1A:</u> Review the draft State Water Supply Plan (SWSP) and newly proposed water diversions that may impact shallow aquifers and streamflow, and provide comments to NJDEP about impacts on the BB watershed ( <b>CCMP 5.20</b> ).	The BBP STAC will submit review comments to NJDEP on the SWSP and any applications for new/ increased water diversions in the BB watershed.	BBP-AC and STAC	1,2,4,6	Staff time / base funding
		<u>WS1B:</u> Convene a stakeholder group to discuss and collaborate on water supply issues, including minimum base flows and need for a Regional Water Supply Plan.	Stakeholder group assembled with discussions of water supply sustainability and feasibility of, and need for, a regional plan.	PPA and GCU, BBP, OCSCD, NJDEP, water purveyors (e.g., BTMUA, United Water)	1-7	Staff time / base funding
		<u>WS1C:</u> Develop watershed-specific water supply management initiatives, including feasibility of conservation, reuse, conservation pricing, and other demand management activities ( <b>CCMP 5.21</b> ).	Development of white paper regarding implementation issues in BB; initiate development of implementation plan for identified alternatives (WS4).	PPA and GCU, BBP, NJDEP, water purveyors (e.g., BTMUA, United Water)	1-4, 6,7	Staff time / base funding
<b>WS2</b>	<b>Water Supply Assessment</b>  Undertake water supply assessment studies to support planning and WS1 Actions.	<u>WS2A:</u> Identify data/information gaps, such as non-regulated shallow aquifer withdrawals for irrigation ( <b>CCMP 5.22</b> ).	Data gaps are identified and documented.	BBP-STAC, NJDEP, USGS, OCSCD, water purveyors (e.g., BTMUA, United Water)	1,2,4	Staff time / base funding
		<u>WS2B:</u> Review existing data and data developed by NJDEP/USGS through BB 10 Point Plan (Action #7) and consider the need for a new study to determine the level of freshwater inputs that are needed to ensure ecosystem integrity ( <b>CCMP 5.20</b> ).	Report/white paper on “maintenance flows” and related priority concerns.	NJDEP, BBP-STAC, Rutgers/JC NERR, USGS, USFWS, water purveyors (e.g., BTMUA, United Water)	1,2,4	Staff time / base funding
<b>WS3</b>	<b>Water Conservation Education</b>  Increase awareness and promote actions toward improved water conservation.	<u>WS3A:</u> Support public education about the status of the water supply, and promote water conservation and re-use projects ( <b>CCMP 5.24</b> ).	Development of public education campaign.	PPA and GCU, BBP CEC (to coordinate), RCE, USGS, OCUA, OCSCD, water purveyors, LBIF	1-7	Staff time / base funding;
		<u>WS3B:</u> Increase residential conservation in households by promoting conservation techniques (e.g., low-flow appliances, rain barrels). Cross-promote SJ actions for water conservation/education.	Development of public education campaign.	BBP-CEC, OCSCD, Sustainable Jersey	1-7	Staff time / base funding

	Water Supply Objectives	Actions	Deliverables	Partners and Leads	Environmental Outcomes Supported	Secured/Potential Funding
WS4	<b>Water Conservation and Stewardship Initiatives</b>  Improve water conservation in the Barnegat Bay watershed.	<u>WS4A:</u> Increase conservation and reuse of water via projects that reduce usage and promote reuse or recharge at public and private facilities (e.g., golf courses) using BMPs and new techniques.	Demonstration project(s) completed in the watershed; invite water purveyors to join BBP committees.	BBP-CEC; OCSCD; Rutgers; OCUA, BTMUA, municipal partners	1-7	Staff time / base funding; project funds?
		<u>WS4B:</u> Increase conservation at the municipal level through various efforts (e.g., education, strengthening of existing ordinances, Sustainable Jersey and other new model ordinances).	Education/outreach to municipalities regarding water supplies; promote existing and new ordinances as appropriate.	BBP-CEC; PPA, Sustainable Jersey, municipal partners	1-7	Staff time / base funding
		<u>WS4C:</u> Increase number of participants implementing the Sustainable Jersey water conservation measures (e.g., model ordinances, green landscaping/maintenance, rain gardens/barrels, etc.).	Greater collaboration between BBP and Sustainable Jersey; Increased participation in the program.	NJDCA and its partners, BBP-CEC, PPA, LBIF, Sustainable Jersey, municipal partners	1-7	Staff time / base funding

## HABITAT PRIORITY AREA

**Priority:** To protect, restore and enhance habitats, especially submerged aquatic vegetation, marshes, shellfish and large terrestrial tracts.

### Environmental Outcomes:

#### *Long-term:*

- 1) Protect, restore, and enhance quality habitats that support self-sustaining populations of native species to include, where feasible, federally- and state-listed species and other native species.
- 2) Acquire wetlands, adjoining wetland buffers, forests and other uplands (~1000 acres/year) to support the ecosystem services provided by these habitats.

#### *Intermediate:*

- 3) Develop a comprehensive restoration and remediation plan with strategies for wetlands, benthic habitats, and uplands throughout the watershed.
- 4) Improve condition and connectivity of riparian buffers and corridors throughout the watershed.
- 5) Improve understanding of the condition, ecology, and threats to wetlands, shellfish habitats, and submerged aquatic vegetation.

#### *Short-term:*

- 6) Incorporate sea-level rise and other climate change concerns (e.g., wetland migration and submergence) into all acquisition and restoration planning.
- 7) Increase public awareness of our efforts and the benefits of habitat protection, enhancement, and restoration.

	Habitat Objectives	Actions	Deliverables	Partners and Leads	Environmental Outcomes Supported	Secured/Potential Funding
H1	<p><b>Maintain and restore habitat buffers</b></p> <p>Maintain, restore, and improve shoreline and riparian buffers adjacent to coastal wetlands and freshwater tributaries, respectively, to prevent habitat loss and maintain continuous corridors for habitat protection and low-impact recreational pursuits (<b>CCMP 6.1 and 6.3</b>).</p>	H1A: Identify locations and sizes of buffers throughout the entire watershed.	Map of buffer locations in watershed. Work already done by Lathrop and Haag (2007) <i>Assessment of Land Use Change and Riparian Zone Status in the Barnegat Bay and Little Egg Harbor Watershed: 1995-2002-2006</i> will be valuable.	NJDEP, ALS, RCE, USACE, USFWS, OCPD, NOAA/NMFS/RC, OCSCD, other restoration groups (e.g., Coastal America)	2-4, 7	National Fish Habitat Partnership, NFWF, Corporate Wetland Restoration Partnership (CWRP), NOAA, EPA R2
		H1B: Evaluate ecological functionality of existing buffers and evaluate effectiveness/success of previous buffer restoration projects.	<ol style="list-style-type: none"> <li>1. Buffer evaluations completed.</li> <li>2. Established priorities for buffer creation, protection and restoration.</li> <li>3. Develop adaptive planning for SLR.</li> <li>4. Report on buffer restoration projects.</li> </ol>	BBP-STAC, NJDEP, Rutgers/JC NERR, Rutgers/CRSSA, RCE, EPA R2, USFWS, NRCS, NOAA/NMFS/RC, OCSCD, OCPD	2-4, 7	Staff time/ base funding
		H1C: Assess eroding shorelines and develop a restoration strategy that includes a funding mechanism.	<ol style="list-style-type: none"> <li>1. Map of shorelines suffering from erosion in the watershed.</li> <li>2. Shoreline Restoration Strategy developed.</li> </ol>	NJDEP CMO, RU CRSSA, MACWA, ALS, JCNERR, OCSCD	1-4, 7	NOAA
		H1D: Research, summarize, promote, and implement restoration approaches (e.g., living shorelines, reuse of dredged material).	<ol style="list-style-type: none"> <li>1. Identify publicly owned lands or other appropriate sites for piloting restoration projects.</li> <li>2. Implement and monitor at least two living shoreline or similar restoration projects.</li> </ol>	BBP-STAC, NJDEP, NOAA/NMFS, USFWS, Rutgers/JCNERR, ALS, USACE, NJDOT, OCPD, municipal partners	1, 3, 5-7	Staff time/ base funding
		H1E: Inventory and map sediments in Barnegat Bay.	Subaqueous Soil Mapping Project completed.	NRCS, OCSCD	1, 3, 5-7	NRCS
		H1F: Evaluate classification of riparian/estuarine buffers.	<ol style="list-style-type: none"> <li>1. Evaluate and re-assess buffer protections in BB.</li> <li>2. Identify areas that require stronger protection measures (e.g., C1 designation and implementation).</li> </ol>	BBP-STAC, ALS, JCAA, USFWS, NOAA, NRCS, other partners	1, 4-7	Staff time/ base funding

	Habitat Objectives	Actions	Deliverables	Partners and Leads	Environmental Outcomes Supported	Secured/Potential Funding
			3. Promote reclassification of areas in need of additional protection.			
<b>H2</b>	<b>Maintain and restore bay habitats</b>  Restore critical estuarine habitats within Barnegat Bay.	H2A: Create bay-wide plan for shellfish and SAV restoration as a component of a comprehensive bay-wide restoration plan.	Written Shellfish and SAV Restoration Blueprint for Barnegat Bay.	NJDEP Bureau of Shellfisheries, NJ Aquaculture Innovation Center, Rutgers University, ALS, USFWS	1, 3, 5, 7	NOAA, EPA R2, USACE, private foundations
		H2B: Support restoration and education efforts, such as Barnegat Bay Shellfish Restoration Program.	1. Engagement of public in restoration activities. 2. Well-informed public on the challenges to and benefits of shellfish restoration.	NJ Aquaculture Innovation Center, ReClam the Bay, NJDEP, ALS, USFWS, Rutgers Cooperative Extension	7	NOAA, EPA R2, USACE, private foundations
		H2C: Conduct regular assessments of SAV distribution, abundance and health.	Characterize SAV distribution/abundance with remote sensing technology and ground-truthing every 3-5 years.	BBP, NJDEP Bureau of Shellfisheries, RU/CRSSA, JCNERR	1, 3, 5	BBP, NJDEP, NOAA, EPA R2, USACE
		H2D: Identify potential sites suitable for SAV restoration.	Characterize areas that possess basic requirements for SAV production (e.g., light, depth, etc.).	BBP, RU/CRSSA, JCNERR, ALS, NRCS	1, 3, 5	NOAA, EPA R2, USACE, NRCS
		H2E: Evaluate structure and function of tidal wetlands within the Bay in order to inform future restoration efforts, land acquisition and adaptive management strategies.	MACWA Assessment and monitoring completed.  JCNERR Sentinel Wetlands Monitoring Program.	BBP, PDE, Academy of Natural Sciences in Phil., NJDEP, USFWS, JCNERR, EPA R2	1, 3, 5	EPA R2, NJ Coastal Management Office, 319H funding, NOAA
		H2F: Develop partnerships to identify funds to implement projects in the USACE's Barnegat Bay Ecosystem Restoration Feasibility Study (2003) (CCMP 6.2).	Identify fund sources for match for federal restoration projects; at least one site in queue for design phase or beyond (permitting, construction, etc.).	USACE, USFWS, NJDEP, NMFS, OCPD-OCNLT, ALS, BBP	1	USACE requires local sponsor



	Habitat Objectives	Actions	Deliverables	Partners and Leads	Environmental Outcomes Supported	Secured/Potential Funding
		<u>H2G</u> : Develop partnerships to identify funds to implement projects in the USACE's 2003 BB Ecosystem Restoration Feasibility Study (see CCMP 6.2).	Identify fund sources for match for federal restoration projects.	USACE, NJDEP, USFWS, NMFS, OCPD-OCNLT, ALS, BBP	1	USACE requires local sponsor (state, county, other)
<b>H3</b>	<b>Develop habitat strategies to address climate change impacts.</b>  Incorporate sea level rise, wetlands migration/ submergence and other impacts into Bay-wide restoration planning.	<u>H3A</u> : Identify habitats potentially threatened by climate change as a part of the bay-wide restoration plan.	Map/report of habitats and sites threatened.	BBP-STAC, Rutgers/JC NERR & CRSSA, USGS, USFWS, NMFS, NJDEP, NRCS, Sustainable Jersey Climate Task Force	1, 3, 5, 6	Staff time, broader scale efforts depend on additional funds
		<u>H3B</u> : Develop conservation/ restoration targets to improve resiliency of habitats/ sites threatened by climate change as a part of the bay-wide restoration plan.	Adaptation projects are initiated.  2008 JCNERR workshop completed.	BBP, NJDEP, JCNERR, USFWS, NOAA, NRCS	1, 3, 5, 6	Staff time, base funding
		<u>H3C</u> : Identify strategies to protect habitats impacted by climate change.	Identify and map habitats vulnerable to SLR.  Develop adaptation strategies appropriate to specific sites (land acquisition, migration, easement, land management strategies).  Explore opportunities for funding and develop grant/ project proposals with specific funding entities for projects to address adaptation to climate change impacts.	No lead. Other partners: NJDEP, USFWS, Ocean County, JCNERR, EPA R2, NOAA, USACE, ALS, municipalities	1, 3, 5, 6	Staff time, base funding
<b>H4</b>	<b>Protect the integrity of barrier islands and peninsulas bounding</b>	<u>H4A</u> : Maintain and restore dune and beach habitats along the Bay.	Study results that can effect management changes, if necessary.	No lead. Other partners: NJDEP DLUR, BBP, NRCS, local municipalities,	1, 5, 6	USACE, NRCS Plant Material Center, municipal matching funds

	Habitat Objectives	Actions	Deliverables	Partners and Leads	Environmental Outcomes Supported	Secured/Potential Funding
	<b>the Barnegat Bay.</b>  Promote BMPs for protecting barrier island and peninsula habitats.			USACE, OCSCD, GCU		
		<b>H4B:</b> Work with local communities to find low cost best management solutions for dune protection and beach restoration.	<b>Workshops, training, and education/outreach for township managers and decision-makers.</b>	No lead. Other partners: BBP, NJDEP, NRCS, local municipalities, USACE, OCSCD, GCU	1, 5, 6	USACE, NRCS Plant Material Center, municipal matching funds
		<b>H4C:</b> Conduct research to better understand impacts of vegetation changes (invasive plants) on dune integrity and threatened and endangered plant and animal species.	Projects focusing on elimination of Asiatic sand sedge and restoration of diverse natural plant assemblages in unvegetated or invaded dunes.	GCU, NRCS, USFWS NPS, State Park System, coastal municipalities	5	NFWF, NPS, Friends of Island Beach, Conserve Wildlife Foundation of NJ, MAPAIS, NJ Sea Grant, NRCS Plant Material Center
		<b>H4D:</b> Identify key parameters to monitor in preparation for creation of an adaptive plan for dune management in response to SLR rise.	Identify and initiate monitoring of key parameters.  Inventory and monitor beach profiles.	Rutgers CESU, USFWS, Stockton College, Stevens, NJDEP Coastal Engineering, USACE	5, 6	FEMA, USGS
<b>H5</b>	<b>Identify and review strategies to protect and restore key habitats.</b>  Review plans and programs to support and promote effective projects.	<b>H5A:</b> Review and evaluate implementation of current regulations and identify gaps to ensure protection of key habitats (e.g., CAFRA, Flood Hazard Area Rules, Freshwater Wetlands Protection Act, etc.; <b>CCMP 6.10</b> ).	Gap analysis completed;  BBP STAC input and review of revised CZM and other rules and planning activities.	No lead. Other partners: developers and builders, USFWS, ALS, PPA, NOAA/NMFS, EPA R2, MU-UCI, NJDEP	1, 3, 5, 6	NJDEP/BBP Staff time/base funding
		<b>H5B:</b> Utilize current habitat data and priorities (e.g., NJ Wildlife Action Plan, TPL's 2020 plan) to facilitate partnerships and funding for	Updated list of lands for prioritized protection (which could include acquisition, easements, mitigation banking, etc.). [Governor's Action Plan #5]	BBP, TPL, USACE, USFWS, NJDEP (Green Acres), OCPD-OCNLT, Sustainable Jersey, others	1, 3, 5, 6	Green Acres, TPL, LWCF, DOD, OCNLT, NOAA (CELP)

	Habitat Objectives	Actions	Deliverables	Partners and Leads	Environmental Outcomes Supported	Secured/Potential Funding
		targeted natural lands acquisition, management and protection ( <b>CCMP 6.5 and 6.12</b> ). Cross-promote Sustainable Jersey actions (e.g., habitat conservation ordinance).	Increased funding/ acquisition for land protection.			
		<u>H5C</u> : Collaboratively address regulatory issues regarding restoration projects.	Work to streamline regulations to implement and assess new restoration strategies.	BBP, NJDEP, Ocean County, Rutgers, ALS,	1, 3, 5, 6	Staff time/ base funding

## FISHERIES AND WILDLIFE PRIORITY AREA

**Priority:** To protect, restore and enhance healthy populations of finfish, shellfish, and wildlife by increasing our understanding of the dynamics of biotic communities.

### Environmental Outcomes:

#### *Long-term:*

- 1) Rebuild and maintain populations of healthy freshwater, estuarine-dependent, and marine fish and shellfish;
- 2) Rebuild and maintain populations of state- and federally-listed terrestrial species and species of special concern;
- 3) Increase acreage for shellfish harvest and propagation;
- 4) Reduce and control populations of invasive species throughout the watershed (Chinese mitten crabs, Japanese stilt grass, and others);

#### *Intermediate:*

- 5) Implement projects to protect and enhance important fishery resource species (e.g., American eel, river herrings, clams, crabs, and bay scallops) and Essential Fish Habitat;
- 6) Identify priority data gaps (e.g., recognition of the linkages between the bay and the ocean) regarding exploited ecologically valuable species, and other species of interest (e.g., jellyfishes, threatened and endangered avian and herp species) and their management;
- 7) **Improve public information on the status of Barnegat Bay fisheries and wildlife, and their ecological, societal, and economic importance;**
- 8) Implement projects to reduce the extent and prevalence of invasive species within the watershed;

#### *Short-term Outcomes:*

- 9) Determine the status of diadromous and other priority fishery species, such as river herring, American eel, blue crabs, hard clams, and forage species;
- 10) Monitor the status of state- and federally-listed threatened or endangered species and species of special concern within the Barnegat Bay watershed;
- 11) Monitor and assess freshwater fish and shellfish as indicators of water quality;
- 12) Assess power plant impacts on biotic resources (Governor's Action Plan [GAP] research project).

	<b>Fisheries and Wildlife Objectives</b>	<b>Action</b>	<b>Deliverables</b>	<b>Partners and Leads</b>	<b>Environmental Outcomes Supported</b>	<b>Secured/Potential Funding</b>
<b>FW1</b>	<b>Monitor and Assess Aquatic Biota</b> Conduct monitoring and assessment within BB and its watershed to identify actions that will support protection, restoration, and enhancement.	<u>FW1A</u> : Monitor and assess the status of commercially, recreationally, and biologically important estuarine and marine species. (See Governor's Action Plan Task #9.)	Detailed population assessment of hard clams, including recruitment, fishing and natural mortality.	NJDEP (BSF and DFW), Rutgers HRSL	1, 3, 4, 5	Governor's Action Plan, BBP-STAC project, funds needed
			Ongoing assessments of species that are exploited or are of management concern.	NJDEP BSF and DFW, BBP, NOAA/NMFS, USFWS, JCAA, Rutgers HRSL	1, 4, 5, 6, 7, 8	Funding needed
		<u>FW1B</u> : Improve assessment of Oyster Creek power plant impacts.	Request to Exelon for voluntary monitoring program establishment.	BBP-AC, Exelon, Rutgers/JCNERR, ALS, others	1, 4, 5, 7, 8, 10	Funding needed: Exelon, <i>et al.</i>
		<u>FW1C</u> : Monitor and assess freshwater fishes and shellfishes.	Evaluation of the ability of water bodies within the watershed to support native fishes and shellfishes.	Pinelands Commission, BBP-STAC, NJDEP, USFWS	1, 5, 8, 9,11	Funding needed
		<u>FW1D</u> : Monitor contaminant levels in fish and shellfish.	Develop a report on contaminant levels and gaps.	NJDEP, NOAA/NMFS, USFWS	1, 3, 5, 9, 11	Funding needed
<b>FW2</b>	<b>Mitigate Barriers to Fish Passage</b>	<u>FW2A</u> : Inventory barriers to fish migration.	A report (GIS map ) detailing existing impediments to passage, including culverts, dams, <i>etc.</i>	NJDEP DFW, ALS, Pinelands Commission, CWFNJ	1, 4, 5, 7, 8	Funding needed
		<u>FW2B</u> : Develop a plan to address barriers to fish migration.	A prioritized list of projects, including impediment removal, ladders/passage devices, or replacements.	NJDEP (DFW, OEC, ONRR), Pinelands Commission, ALS, NOAA, USFWS	1, 4, 5, 7, 8	Funding needed: NOAA CRP, Corporate Wetland Restoration
<b>FW3</b>	<b>Improve and Increase Fisheries education</b>  <b>Build public understanding and support for fisheries priorities</b>	<u>FW3A</u> : Produce educational materials about the functional role of the bay in early life stages of estuarine-dependent species ( <i>e.g.</i> , flounder, bluefish, clams, oysters); cross-promote with SJ ( <i>e.g.</i> , Animals in the Community) and other educational	Collect and review existing public outreach materials; revise and develop new materials as needed.	JCAA, RCTB, NOAA/NMFS, RCE/BBSRP/RCTB, MATES, USEPA, USFWS, Rutgers/JCNERR, BBP, NJDEP BSF, Sustainable Jersey	1, 3, 6	Staff time / base funding

	Fisheries and Wildlife Objectives	Action	Deliverables	Partners and Leads	Environmental Outcomes Supported	Secured/Potential Funding
		efforts.				
<b>FW4</b>	<b>Assess and Monitor Threatened and Endangered Species and Species of Concern</b>	<b>FW4A:</b> Monitor and assess the status of state- and federally-listed threatened and endangered species and species of special concern, including their habitat. Cross-promote SJ actions (e.g., NJ Wildlife Action Plan pledge).	Assessments of population and habitat parameters for listed species, including a summary for the <i>State of the Bay Report</i> .	CWFNJ, NJDEP, USFWS, BBP on OCC campus, Sustainable Jersey	2, 6, 7, 10	Staff time / base funding, additional funding needed
<b>FW5</b>	<b>Monitor Invasive/ Nuisance Species and Increase Public Awareness</b>	<b>FW5A:</b> Assess the occurrence of invasive and nuisance species (e.g., jellyfishes), especially those with impacts to fisheries and/or water quality, and their impacts within the BB watershed.	Reports on distribution and impacts of various invasive species; development of management plans as necessary.	BBP, USFWS, NOAA, NJDEP, OC Parks, BBP, Pinelands, NJ Invasive Species Strike Force	4, 6, 8  Swimmable bay beaches regarding jellyfishes (WQ criteria)	Base funding commitment to priority species with funding support; funds needed
		<b>FW5B:</b> Educate the public about the causes and adverse impacts of invasive species.	Review and revise existing and outreach materials (e.g., USFWS).	BBP-CEC, CWFNJ	4, 7, 8	Funding needed
<b>FW6</b>	Restoration of shellfish and their habitat	<b>FW6A:</b> Evaluation and monitoring of restoration demonstration areas.	Evaluation of methods used and assessment of their success.	NJDEP BSF, NJ Shellfish Council, RCE/BBSRP/RCTB, Rutgers HRSL, NOAA	1, 3, 5, 6, 7, 9	Staff time / base funding, funding needed
		<b>FW6B:</b> Implementation of significant shellfish restoration.	Increased acreage of shellfish restoration based on F6A.	NJDEP BSF, NJ Shellfish Council, RCE/BBSRP/RCTB, NOAA, Rutgers HRSL, ALS		Staff time / base funding, funding needed

## LAND USE PRIORITY AREA

**Priority:** To promote and implement holistic and collaborative land use practices for existing and future development that will conserve, restore and enhance water resources throughout the Bay watershed.

### Environmental Outcomes:

#### *Long-term:*

- 1) Undertake comprehensive planning and integrated land use management across municipal, county, and state governments throughout the watershed.
- 2) Identify and encourage land use development and re-development techniques that conserve and restore natural resources and take into account dynamic bay conditions, such as those associated with future development and climate change.
- 3) Develop programs to recognize LID successes, to further education, and showcase practices or projects as state/national models.
- 4) Establish a network to promote demonstrated successful restorative land use practices.

#### *Intermediate:*

- 5) Assess, establish, and define, at scales appropriate for management, the relationship of current and future land uses to the restoration and protection of the bay's water quality.
- 6) Identify and establish best practices to restore and enhance water quality/quantity and other natural resources and to begin to take into account the need for potential adaptive management techniques that can address climate change.
- 7) Develop an intergovernmental management plan for open space management and conservation throughout the watershed.

#### *Short-Term:*

- 8) Characterize the land use related contributions (loadings) of priority pollutants (nutrients) to the Bay and its tributaries by source, magnitude, and location.
- 9) Evaluate the degree of future urbanization of the watershed inherent in present land use policies and the increase in associated pollutant loadings.
- 10) Evaluate the effectiveness of current land use management policies and programs in reducing current nutrient loads and mitigating against future nutrient loading.
- 11) Create a database of current established or demonstrated effective LID practices and projects within the watershed.
- 12) Promote and participate in the Special Area Management Planning process contained within the Governor's 10 Point Plan as a means of integrating land use governance.
- 13) Develop effective programs to work with municipalities to align local policies with CCMP and SP.
- 14) Establish short-term nutrient reduction goals.

	Land Use Objectives	Actions	Deliverables	Partners and Leads	Environmental Outcomes Supported	Secured/Potential Funding
LU1	<b>Assessment and Evaluation of current land uses</b>  Support efforts to identify and better understand impacts of current land uses on the watershed	<u>LU1A</u> : Estimate pollutant loading associated with various current and zoned land uses within the watershed.	STAC white paper	BBP STAC, OCPD, municipal partners, RU CRSSA, NJDEP	1, 5, 6, 8, 9	CBT; funding needed
		<u>LU1B</u> : Evaluate current land use, plans and policies (e.g., zoning densities, impervious coverage allowances) to determine associated loadings, sources, magnitude and location within the watershed.	STAC white paper: loading estimates for towns/ sub-basins	NJDEP, BBP STAC, OCPD	1, 5, 6, 8, 9	Funding needed: expanded NEIWPCC study
		<u>LU1C</u> : Evaluate a representative sample of existing loading sources such as stormwater basins, septic systems, and wildlife and estimate loading contributions; also assess mitigation of nutrients by land use activities/ infrastructure.	STAC whitepaper or funded study report(s): loading estimates (empirical and/or modeled) for landscape features and mitigation effects.	NJDEP, STAC, OCPD, PPA	1, 5, 6, 8, 9	Funding needed
		<u>LU1D</u> : Inventory landscape features (e.g. “green infrastructure”) which may play role in current condition in mitigating nutrient pollution to Bay (open space, forest, wetlands, ground water recharge zones); cross-promote actions in the Sustainable Jersey program (e.g., Community asset mapping).	An inventory map for the entire Bay, identifying protected areas and those that may need protection.	NJDEP, RU, TPL, BBP, OCPD, MCPD, PC, OCSCD, Sustainable Jersey Green Infrastructure, Land Use, and Transportation Task Forces	2, 3, 4, 6, 8, 10, 11	Funding needed



	Land Use Objectives	Actions	Deliverables	Partners and Leads	Environmental Outcomes Supported	Secured/Potential Funding
LU2	<b>Assessment and evaluation of future land uses</b>  Review impacts of future potential land uses and loadings.	<u>LU2A:</u> Evaluate watershed build out (on a subwatershed and full watershed basis) under existing land use policies and standards.	Report to develop alternative development scenarios to reduce loads to various target reductions.	PPA, NJDEP, Pinelands Commission, Rutgers JCNERR/ CRSSA/ SSC, OCSCD, municipalities, Shore Builders, OCPD, MCPD	9; Also minimized impervious coverage and landscape/soil disturbance; Improved storm water management and ecosystem functions.	
		<u>LU2B:</u> Adopt approaches for estimating mitigation of projected loadings on watershed and subwatershed scales.	Voluntary or “carrot and stick” approaches to new development and redevelopment projects.	Builders, developers, NJDEP, Pinelands Commission, OCSCD	3, 4; Also, more LID throughout the watershed.	Various
LU3	<b>Planning Based on Assessment and Evaluation of Current and Existing Land Uses</b>  Encourage comprehensive land use planning and coordinated management of open space and natural systems throughout the watershed to promote conservation and protection of natural resources while providing the opportunity for further economic development.	<u>LU3A:</u> Evaluate the effectiveness of current land use planning programs, regulations, and statutes.	Evaluation and recommendations report.	No lead. Other partners: BBP, JCNERR, OCPD, MCPD, NJDEP, NJOPA, Pinelands Commission, PPA, Sustainable Jersey Land Use, Green Infrastructure, and Transportation Task Forces	1, 2, 5, 6, 10	STAC/BBP partner funding (county and/or municipal)
		Cross-promote Sustainable Jersey program actions (e.g., Sustainable Land Use pledge).				
		<u>LU3B:</u> Develop program to work with municipalities to align their master plans and land use ordinances with the CCMP and BBP priorities for habitat and water quality protection (CCMP 6.9)	Number of municipal master plans that incorporate BBP priorities.	BBP, JCNERR, OCPD, MCPD, NJDEP, NJOPA Pinelands Commission, municipal partners	1, 2, 5, 6, 13	STAC/ BBP partner funding (county and/or municipal)
	<u>LU3C:</u> Participate in the development of the BB SAMP as delineated through the current Coastal Management Office’s 309 assessment strategy as approved by NOAA (Governor’s Action Plan component).	Development and implementation of a BB SAMP (Governor’s Action Plan component).	NJDEP, OCPD, Rutgers/JCNERR-SSC, RCE, OCSCD, BBP, PPA, other NGOs	1, 2, 5, 6, 12	NJDEP funds; NOAA (Governor’s Action Plan component)	

	Land Use Objectives	Actions	Deliverables	Partners and Leads	Environmental Outcomes Supported	Secured/Potential Funding
		<u>LU3D</u> : Evaluate the potential for innovative zoning techniques, such as TDR, non-contiguous density transfer, center-based development, septic density. Cross-promote SJ actions (e.g., clustering ordinances).	Feasibility analysis, model ordinances.	No lead. Other partners: BBP, OCPD, MCPD, NJDEP, NJOPA, PPA, Pinelands Commission, Sustainable Jersey, municipal partners	1, 2, 5, 6, 13	NJDEP funds (604b/CBT)
		<u>LU3E</u> : Evaluate the effectiveness of current open space preservation, management, and stewardship programs.	Evaluation and recommendations report.	BBP, OCPD, MCPD, NJDEP (Green Acres), NJACD, ANJEC	7	
		<u>LU3F</u> : Evaluate the potential effectiveness of a regional stormwater plan for the BB watershed.	Evaluation and recommendations report.	No lead. Other partners: BBP, OCPD, MCPD, NJDEP, municipalities	6, 10	
		<u>LU3G</u> : Evaluate the potential for habitat conservation planning, at the subwatershed, municipal, or BB watershed scale.	Evaluation and recommendations report.	No lead. Other partners: BBP, OCPD, MCPD, NJDEP (ENSP), Pinelands Commission	4, 7	
		<u>LU3H/I</u> : Develop a Planning Assistance Team to assist municipalities to incorporate BBP priorities into planning documents, and implement programs.	Pilot program; MOU between applicable agencies/BBP partners.	BBP, OCPD, MCPD, NJDEP, Pinelands Commission	13	Base funding

	Land Use Objectives	Actions	Deliverables	Partners and Leads	Environmental Outcomes Supported	Secured/Potential Funding
LU4	<p><b>Encourage Low Impact Development (LID) techniques and protective land use practices for existing and proposed development and redevelopment</b></p> <p>Foster the implementation of design standards that incorporate low-impact development techniques, restorative land management practices and sustainable best management practices for existing and proposed development at the regional and local level.</p>	<p><u>LU4A:</u> Participate in existing NJDEP stakeholder process to improve Stormwater Management and related regulations, including NJPDES regulations, to protect BB water resources.</p>	<p>Make recommendations on appropriate design standards for the BB Watershed (White Paper).</p> <p>Make recommendations on best management practices (BMPs) and associated LID techniques for existing development in the BB Watershed (White Paper).</p> <p>Update NJPDES Municipal Stormwater General Permits BMP Requirements</p>	<p>PPA, NJDEP, Pinelands Commission, Rutgers/JCNERR-SSC, OCSCD, Municipalities, ALS, Shore Builders, OCPD, MCPD</p>	<p>Improved stormwater management and ecosystem functions.</p> <p>Reduced TSS and nutrient loadings into BB.</p>	
		<p><u>LU4B:</u> Develop a workgroup that includes representatives from municipal public works, municipal engineering, counties, Pinelands Commission, senior villages, property managers, regulators, builders, developers and other interested parties to identify impediments to and solution for implementing LID practices at existing public and private developments and to identify existing regulatory gaps and conflicts with the utilization of proper LID techniques.</p>	<p>Establishment of an implementation work group.</p> <p>Regulatory gaps, conflicts &amp; other constraints identified.</p> <p>Funding sources identified.</p>	<p>No lead. Other partners: towns, Pinelands Commission, OCPD, MCPD, NJDEP, Shore Builders, ALS, PPA, OCSCD</p>	<p>More and improved LID utilization throughout the watershed.</p>	

	Land Use Objectives	Actions	Deliverables	Partners and Leads	Environmental Outcomes Supported	Secured/Potential Funding
		<u>LU4C</u> : Work with local governments, senior villages, property management professionals, builders, developers and Ocean County College to promote LID demonstration projects.	Implementation of projects at existing public and private developments, at OCC and at new developments.	OCSCD, OCC, NJDEP, Pinelands Commission, OCPD, Towns, BBP-SCW, Brick Twp. Utilities, ALS, Shore Builders, PPA, NJDCA & Sustainable Jersey, OCSCD, OCC	Improved stormwater management.  Reduced TSS & Nutrient loadings.	
		<u>LU4D</u> : Promote and support municipal and appropriate partner participation in Sustainable Jersey.	Obtain LID performance data.  Increased participation in Sustainable Jersey.	Sustainable Jersey and BBP Partners, Municipalities	Sustainable coastal communities.	
		<u>LU4E</u> : Identify, review, and promote LID BMP model ordinances that properly implement LID strategies and associated techniques.	White paper with recommendations on additional model ordinances as needed.	NJDEP, Pinelands Commission, NJDCA, PPA, ALS, Shore Builders, OCPD, MCPD	Improved stormwater management.  Reduced TSS & Nutrient loadings.	
		<u>LU4F</u> : Promote soil restoration techniques at existing public and private development and redevelopment.	Develop a manual for soil protection and restoration techniques; include manual information on HealthySoils.org website. Sponsor workshop on "soil protection and restoration" <i>i.e.</i> , Annual Soil Conference.	OCSCD	Improved soil function and water quality.	
		<u>LU4G</u> : Work with partners to support efforts to control existing erosion problems utilizing appropriate non-structural stabilization.	Non-structural stabilization projects throughout watershed.	OCSCD	Reduction in sediment and turbidity.  Improved Water Quality.	

	Land Use Objectives	Actions	Deliverables	Partners and Leads	Environmental Outcomes Supported	Secured/Potential Funding
LU5	<b>Education and Outreach</b>  Support and assess outreach and education for non-point source (NPS) pollution, LID, responsible water use, native species to reduce nitrogen and phosphorous and practice to promote and restore soil health.	<u>LU5A:</u> Implement specific Communication Plan actions for NPS pollution, LID, responsible water use, native species to reduce nitrogen and phosphorous, and practices to promote and restore soil health.	See BBP Communications Plan for specific activities.	BBP-CEC		Comm Plan/ base funds
		<u>LU5B:</u> Develop workshops and print materials in partnership with NJDEP/others to coordinate and promote LID activities within BB.	Workshops.  Develop a Manual for LID Techniques.	PPA, Princeton Hydro, BBP, others		BBP, others
		<u>LU5C:</u> Develop a pilot recognition program to engage and encourage development professionals, landscapers, public works officials, townships and government agencies regarding design, development or redevelopment and management of bay-friendly practices.	Bay-Friendly Landscaping.  Bay-Friendly Building Certificate.  OCSCD Blue Card Program.	OCSCD, BBP, NJDEP, JCNERR, RCE, NGOs	Improved water quality	

**APPENDIX A**

**2012-2016 STRATEGIC PLAN: LIST OF ACRONYMS/ABBREVIATIONS**

ALS	American Littoral Society
ANJEC	Association of New Jersey Environmental Commissions
BB	Barnegat Bay
BBP	Barnegat Bay Partnership
BBP-AC	Barnegat Bay Partnership Advisory Committee
BBP CEC	Communications and Education Committee
BBP-SCW	Sustainable Communities Workgroup
BBSRP	Barnegat Bay Shellfish Restoration Program
BMPs	Best Management Practices
BTMUA	Brick Township Municipal Utilities Authority
C1 Designation	Category 1 Designation
CAFRA	Coastal Area Facilities Review Act
CBT	Corporate Business Tax
CEC	Communications and Education Committee
CELP	Coastal and Estuarine Land Conservation Program
CCMP	Comprehensive Conservation Management Plan
CMO	Coastal Management Office
CRSSA	Center for Remote Sensing and Spatial Analysis
CWA	Clean Water Act
CWFNJ	Conserve Wildlife Foundation of NJ
CWRP	Corporate Wetland Restoration Partnership
CZM	Coastal Zone Management
DCA	Department of Community Affairs
DOD	Department of Defense
EPA R2	Environmental Protection Agency, Region 2
FEMA	Federal Emergency Management Agency
GAP	Governor's Action Plan
GCU	Georgian Court University
GIS	Geographic Information System
H	Habitat
JCAA	Jersey Coast Anglers Association
JCNERR	Jacques Cousteau National Estuarine Research Reserve
JCNERR-SSC	JCNERR Stormwater Steering Committee
LBIF	Long Beach Island Foundation of the Arts & Sciences
LE	Law Enforcement
LID	Low Impact Development
LWCF	Land and Water Conservation Fund
MACWA	Mid-Atlantic Coastal Wetlands Assessment
MAPAIS	Mid-Atlantic Panel on Aquatic Invasive Species
MATES	Marine Academy of Technology and Environmental Science
MCPD	Monmouth County Planning Department
MOU	Memorandum of Understanding

MRWMP ..... Metedeconk River Watershed Management Plan  
 MTA/NJ ..... Marine Trades Association/New Jersey  
 MU-UCI ..... Monmouth University Urban Coast Institute  
 NASS ..... National Agricultural Statistics Service  
 NEIWPC ..... New England Interstate Water Pollution Control Commission  
 NFWF ..... National Fish and Wildlife Foundation  
 NGO ..... Non-Governmental Organization  
 NJACD ..... New Jersey Association of Conservation Districts  
 NJDA ..... New Jersey Department of Agriculture  
 NJDCA ..... New Jersey Department of Community Affairs  
 NJDEP ..... New Jersey Department of Environmental Protection  
 NJDEP BSF ..... NJDEP Business Stimulus Fund  
 NJDEP DFW ..... NJDEP Division of Fish and Wildlife  
 NJDEP DLUR ..... NJDEP Division of Land Use Regulation  
 NJDEP ENSP ..... NJDEP Endangered and Nongame Species Program  
 NJDEP OEC ..... NJDEP Office of Engineering and Construction  
 NJDEP ONRR ..... NJDEP Office of Natural Resource Restoration  
 NJDOT ..... New Jersey Department of Transportation  
 NJEIT ..... New Jersey Environmental Infrastructure Trust  
 NJOPA ..... New Jersey Office for Planning Advocacy  
 NJPDES ..... New Jersey Pollutant Discharge Elimination System  
 NJSGC ..... New Jersey Sea Grant Consortium  
 NJT ..... New Jersey Transit  
 NJTPA ..... North Jersey Transportation Planning Authority  
 NJWPCA ..... NJ Water Pollution Control Act  
 NMFS ..... National Marine Fisheries Service  
 NOAA ..... National Oceanic and Atmospheric Administration  
 NOAA CRP ..... Community-Based Restoration Program  
 NPS ..... National Park Service  
 NPS-Pollution ..... Non-Point Source Pollution  
 NRCS ..... Natural Resources Conservation Service  
 NWIS System ..... National Water Information System  
 OC Parks ..... Ocean County Parks  
 OCC ..... Ocean County College  
 OCHD ..... Ocean County Health Department  
 OCNGS ..... Oyster Creek Nuclear Generating Station  
 OCNLT ..... Ocean County Natural Lands Trust  
 OCPD ..... Ocean County Planning Department  
 OCSCD ..... Ocean County Soil Conservation District  
 OCUA ..... Ocean County Utilities Authority  
 ONRR ..... Office of Natural Resource Restoration  
 PC ..... Pinelands Commission  
 PDE ..... Partnership for the Delaware Estuary  
 PPA ..... Pinelands Preservation Alliance  
 RC ..... Restoration Center  
 RCE ..... Rutgers Cooperative Extension

RCTB	ReClam the Bay
RFP	Request for Proposals
RU	Rutgers University
Rutgers CESU	Rutgers Cooperative Ecosystem Studies Unit
Rutgers CRSSA	Rutgers Center for Remote Sensing and Spatial Analysis
Rutgers HRSL	Rutgers Haskin Shellfish Research Laboratory
SAMP	Special Area Management Plan
SAV	Submerged Aquatic Vegetation
SJ	Sustainable Jersey
SLR	Sea Level Rise
SP	Strategic Plan
SRF	State Revolving Funds
STAC	Science and Technical Advisory Committee
SW	Stormwater
SWSP	State Water Supply Plan
TBD	To be determined
TDR	Transfer of Development Rights
TMDLs	Total Maximum Daily Loads
TPL	Trust for Public Land
TSS	Total Suspended Solids
UCI	Urban Coast Institute
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WMA 13	Watershed Management Area 13
WMP	Wastewater Management Plan
WQ	Water Quality
WQDE	Water Quality Data Exchange
WS	Water Supply