

**Appendix C - Objectives and Actions for Living Resources**

- **Timeframe** – The timeframe from adoption of the CCMP in which the action should be completed. Short (S) indicates a completion within 1-2 years, Medium (M) actions are completed within 3-5 years, and Long (L) actions take 5 or more years. On-going actions are considered Long.
- **Costs** – The anticipated costs of action components: \$ < \$100,000, \$\$ \$100,000 - \$500,000, \$\$\$ \$500,000 - \$1,000,000, \$\$\$\$ > \$1,000,000.

<i>Goal - To protect, restore and enhance habitats in the Barnegat Bay and its watershed to ensure healthy and sustainable natural communities of plants and animals now and in the future</i>					
LR Objectives	LR Action ID	CCMP Action	Partners, Leads, and Identified Appropriate Funding Sources	Time-frame	Cost?
Develop and implement Habitat Protection and Restoration Plans for the watershed’s characteristic habitats, including ecologically sensitive areas;					
	LR 1-1	<p><b><u>Compile existing data and maps; determine and collect missing data for ecologically sensitive habitats and associated buffers.</u></b></p> <p><b>METRICS:</b> The number of complete maps of ecologically sensitive areas</p> <p><b>MILESTONES:</b>                      1-1a – Identify relevant ecologically sensitive areas.                      1-1b – Compile existing maps and data.                      1-1c – Collect missing data.</p>	Partners: NJDEP, Pinelands Commission  Lead(s): BBP  Funding Sources: Clean Water Act Section 320; DEP State Revolving	S	\$

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		1-1d – Update and publish mapping.	Funds, EIT; Other TBD.		
	<b>LR 1-2</b>	<p><b><u>Develop and implement conservation/restoration plans for ecologically sensitive terrestrial, coastal and aquatic habitats.</u></b></p> <p><b>METRICS:</b> The acreage of ecologically sensitive areas conserved/restored</p> <p><b>MILESTONES:</b>          1-2a – Develop conservation/restoration plans.          1-2b – Identify funding sources and procure funds where needed.          1-2c – Implement plans.          1-2d – Assess implementation and conduct adaptive management.</p>	<p>Lead(s): BBP, NJDEP, USFWS</p> <p>Funding Sources: Clean Water Act Section 320; DEP State Revolving Funds, EIT; Other federal (NFWF, NOAA, ACFHP); Other TBD</p>	L	\$\$-\$\$\$
	<b>LR 1-3</b>	<p><b><u>Create a web-accessible database of habitat protection and restoration activities.</u></b></p> <p><b>METRICS:</b> A complete, web-accessible database</p> <p><b>MILESTONES:</b>          1-3a – Compile existing information from partners and agencies.          1-3b – Develop web-based database.          1-3c – Publish database.</p>	<p>Partners: BBP, NJDEP, USFWS, Counties</p> <p>Lead(s): BBP</p> <p>Funding Sources: CWA Section 319 &amp; 320; DEP State Revolving Funds, EIT; Other TBD.</p>	S	\$
	<b>LR 1-4</b>	<p><b><u>Encourage the protection and management of habitats on a sub-watershed basis through coordination and collaboration across municipal boundaries.</u></b></p>	Partners: BBP, Counties, Municipalities	M	\$

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		<p><b>METRICS:</b> The acreage of habitat managed across municipal boundaries</p> <p><b>MILESTONES:</b>          1-4a – Identify sensitive habitat areas crossing municipal borders (see 1-2).          1-4b – Meet with municipal officials/planners/engineers.          1-4c – Develop cross-border management plans.</p>	<p>Lead(s): BBP, CWFNJ; Others TBD          Funding Sources: CWA Section 319 &amp; 320; DEP State Revolving Funds, EIT; Other TBD.</p>		
	LR 1-5	<p><b><u>Promote management of ecologically sensitive and other target areas.</u></b></p> <p><b>METRICS:</b> The number of acres under active conservation management</p> <p><b>MILESTONES:</b>          1-5a – Identify currently owned sensitive areas not actively managed.          1-5b – Develop and implement parcel specific management plans (e.g., large or adjoining public parcels).</p>	<p>Partners: USFWS, NJDEP, Ocean County, NJ Marine Trades Association, Pinelands Preservation Alliance, Land Conservancies</p> <p>Lead(s): USFWS, NJDEP, Ocean County Planning</p> <p>Funding Sources: DEP State Revolving Funds, EIT; Ocean County NLT; Other TBD.</p>	L	\$\$
1. Restore and maintain sustainable populations of fish and wildlife					

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	<p><b>LR 2-1</b></p>	<p><b><u>Develop a bay-wide multi-use management plan that supports sustainable aquaculture, commercial and recreational harvest, recreation, and restoration.</u></b></p> <p><b>METRICS:</b> A bay-wide multi-use management plan for Barnegat Bay resources</p> <p><b>MILESTONES:</b>          2-1a – Create a plan development process.          2-1b – Hold stakeholder meetings.          2-1c – Integrate existing data and stakeholder comments.          2-1d – Publish final plan.</p>	<p>Partners:          NJDEP, BBP,          RCE, NJSGC</p> <p>Lead(s): NJDEP,          NJSG</p> <p>Funding          Sources: DEP          State Revolving          Funds, EIT.          Other TBD.</p>	<p>M</p>	<p>\$\$</p>
	<p><b>LR 2-2</b></p>	<p><b><u>Restore fish passage and other riparian habitats to improve habitat quality and connectivity.</u></b></p> <p><b>METRICS:</b> The number of river miles reconnected/number of fish passage barriers removed/improved. The acreage of riparian habitats improved/restored.</p> <p><b>MILESTONES:</b>          2-2a – Identify barriers to fish passage and riparian habitats in need of improvement.          2-2b – Develop plan(s) for passage/habitat improvement          2-2c – Identify funding source(s) for activities.          2-2d – Implement improvement plans.</p>	<p>Partners:          USEPA, BBP,          NOAA, NJDEP,          USFWS,          NJDOT</p> <p>Lead(s): BBP</p> <p>Funding          Sources: CWA          Section 319 &amp;          320, other          federal          (USFWS,          NOAA); DEP          State Revolving          Funds, EIT;          Other TBD.</p>	<p>L</p>	<p>\$\$-\$\$\$\$</p>
	<p><b>LR 2-3</b></p>	<p><b><u>Participate in the implementation and periodic update of the New Jersey State Wildlife Action Plan.</u></b></p> <p><b>METRICS:</b> The number of SWAP projects/actions completed in the watershed</p>	<p>Partners:          NJDEP, BBP</p> <p>Lead(s): NJDEP</p>	<p>L</p>	<p>\$\$-</p>

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		<p><b>MILESTONES:</b>          2-3a – Identify applicable projects within the SWAP.          2-3b – Identify resources required for implementation.          2-3c – Implement plans.</p>	<p>Funding Sources: DEP State Revolving Funds, EIT; Other TBD.</p>		
	<b>LR 2-4</b>	<p><b><u>Create and restore wildlife corridors for habitat quality and connectivity.</u></b></p> <p><b>METRICS:</b> Acreage of wildlife corridors created/restored</p> <p><b>MILESTONES:</b>          2-4a – Identify potentially suitable areas for acquisition /restoration          2-4b – Develop restoration/acquisition plans          2-4c – Implement plans</p>	<p>Lead(s): NJDEP, USFWS, Ocean and Monmouth Counties</p> <p>Funding Sources: Federal, State, OCNLT funds, DEP State Revolving Funds, EIT; Other TBD.</p>	L	\$\$\$- \$\$\$\$
	<b>LR 2-5</b>	<p><b><u>Monitor, manage, and control invasive and nuisance species through ecologically appropriate methods</u></b></p> <p><b>METRICS:</b> Reduction in amount of invasive and nuisance species</p> <p><b>MILESTONES:</b>          2-5a – Identify invasive/nuisance species.          2-5b – Prioritize management activities.          2-5c – Implement management activities.          2-5d – Assess outcomes and conduct adaptive management.</p>	<p>Partners: USEPA, NJDEP, USFWS, BBP</p> <p>Lead(s): NJDEP, NJDA, Other TBD</p> <p>Funding Sources: Federal (NOAA, USFWS, USDA?); DEP State Revolving Funds, EIT; Other TBD.</p>	L	\$\$- \$\$\$

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<p><b>2. Monitor and assess status and trends of living resources throughout the watershed.</b></p>			
	<p><b>LR 3-1</b></p>	<p><b><u>Assess distribution and abundance of SAV through coordinated, regular surveys to evaluate their structure and function.</u></b></p> <p><b>METRICS:</b> Completion of distribution and demographic surveys</p> <p><b>MILESTONES:</b>          3-1a – Develop regularly scheduled survey protocol and identify stable funding source.          3-1b – Conduct aerial surveys.          3-1c – Conduct demographic surveys.</p>	<p>Partners: NJDEP, BBP, Stockton University</p> <p>Lead(s): BBP, RSU, Other TBD</p> <p>Funding Sources: DEP State Revolving Funds, EIT; Other State and Local Funding TBD.</p> <p>L</p> <p>\$\$</p>
	<p><b>LR 3-2</b></p>	<p><b><u>Continue the ongoing Mid Atlantic Coastal Wetlands Assessment program (MACWA) to evaluate the condition and function of wetlands.</u></b></p> <p><b>METRICS:</b> Completion of annual MACWA activities</p> <p><b>MILESTONES:</b>          3-2a – Coordinate annual field activities          3-2b – Conduct fieldwork and data analysis          3-2c – Prepare annual and multi-year reports</p>	<p>Partners: BBP, NJDEP, USEPA</p> <p>Lead(s): BBP, NJDEP</p> <p>Funding Sources: Clean Water Act Section 319, Section 320, &amp; WPDG; NJDEP, CWRP, other TBD</p> <p>L</p> <p>\$\$\$</p>
	<p><b>LR 3-3</b></p>	<p><b><u>Update and/or complete mapping of riparian and tidal wetlands and their buffers to monitor and assess condition (natural, developed, hardened, etc) and wetland migration potential.</u></b></p>	<p>Partners: USEPA, NJDEP</p> <p>Lead(s): NJDEP, Rutgers CRSSA</p> <p>S</p> <p>\$\$\$\$</p>

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		<p><b>METRICS:</b> Extent of mapping of riparian and tidal wetlands and their buffers.</p> <p><b>MILESTONES:</b>          3-3a – Evaluate current promulgated mapping to clarify information needs.</p> <p>3-3b – Utilize existing state mapping and/or or collect new data to address mapping needs.</p> <p>3-3c – Publish updated mapping.</p>	<p>Funding Sources: DEP State Revolving Funds, EIT; Other TBD.</p>		
	LR 3-4	<p><b><u>Continue to monitor and assess the status of commercially, recreationally, and ecologically important aquatic species.</u></b></p> <p><b>METRICS:</b> Population status information available for fish and shellfish species.</p> <p><b>MILESTONES:</b>          3-4a – Evaluate data collection activities for important species, and modify if necessary.</p> <p>3-4b – Collect, analyze, and publish data.</p>	<p>Partners: NJDEP, NOAA, BBP, Stockton University</p> <p>Lead(s): BBP</p> <p>Funding Sources: Clean Water Act Section 319 &amp; 320, DEP State Revolving Funds, EIT; Other TBD.</p>	L	\$-\$\$\$
	LR 3-5	<p><b><u>Monitor and assess target animal and plant species, such as pollinator and migratory species, threatened and endangered species, and plant communities of special importance (see Habitat Plan)</u></b></p> <p><b>METRICS:</b> Population status information available for target species</p> <p><b>MILESTONES:</b>          3-5a – Evaluate data collection activities for important species, and modify if necessary.</p> <p>3-5b – Collect, analyze, and publish data.</p>	<p>Partners: USEPA, NJDEP, Pinelands Commission, USFWS</p> <p>Lead(s): NJDEP, USFWS, NOAA-NMFS</p> <p>Funding Sources: DEP</p>	L	\$-\$\$\$

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			State Revolving Funds, EIT; Other TBD.		
	<b>LR 3-6</b>	<p><b><u>Monitor and assess the impact of the closure of the Oyster Creek Nuclear Generating Station on living resources in the Barnegat Bay.</u></b></p> <p><b>METRICS:</b> A final report on the ecosystem effects of the OCNGS closure</p> <p><b>MILESTONES:</b>          3-7a – Develop monitoring plan.          3-7b – Collect and analyze data.          3-8c – Write final report and recommendations.</p>	<p>Partners: NJDEP</p> <p>Lead(s): NJDEP</p> <p>Funding Sources: DEP          State Revolving Funds, EIT; Other TBD.</p>	M	\$\$
<b>3. Conduct studies to improve scientific understanding of living resources and ecologically sensitive habitats.</b>					
	<b>LR 4-1</b>	<p><b><u>Conduct studies that identify and document appropriate mechanisms and strategies to support restoration of ecologically sensitive habitats identified in Obj. 1.</u></b></p> <p><b>METRICS:</b> The number of completed studies, including recommendations</p> <p><b>MILESTONES:</b>          4-1a – Determine area(s) of need and develop study plan(s)          4-1b – Collect and analyze data          4-2b – Prepare recommendations and distribute to practitioners</p>	<p>Partners: NJDEP, NJSGC, BBP, Stockton University</p> <p>Lead(s): NJDEP, USFWS, NOAA-NMFS, BBP</p> <p>Funding Sources: Federal (NOAA; NFWF); DEP          State Revolving Funds, EIT; Other TBD.</p>	L	\$\$- \$\$\$



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	<p><b>LR 4-2</b></p>	<p><b><u>Identify and assess habitat suitability, connectivity, and barriers to fish passage (e.g. North Atlantic Aquatic Connectivity Collaborative approach.)</u></b></p> <p><b>METRICS:</b> The number of connectivity/passage assessments conducted at potential stream barriers</p> <p><b>MILESTONES:</b>          4-2a – Identify potential barriers to fish passage          4-2b – Prioritize assessment areas based on habitat suitability          4-2c – Conduct assessments</p>	<p>Partners: BBP, NJDEP</p> <p>Lead(s): BBP, NJDEP</p> <p>Funding Sources: CWA Section 320, FEMA, HUD Resilient NJ, ASMFC, MAFMC, WMI, NACC, DEP State Revolving Funds, EIT; Other TBD.</p>	<p>M</p>	<p>\$\$</p>
	<p><b>LR 4-3</b></p>	<p><b><u>Conduct studies that identify and document the life history and/or ecology of pertinent living resources.</u></b></p> <p><b>METRICS:</b> The number of studies conducted</p> <p><b>MILESTONES:</b>          4-3a – Identify potential study subjects          4-3b – Collect and analyze data          4-3c – Disseminate findings</p>	<p>Partners: NJDEP, NOAA, USFWS, Pinelands Commission, BBP, JC NERR</p> <p>Lead(s): Rutgers MFS,</p> <p>Funding Sources: Federal (NOAA), DEP State Revolving Funds, EIT; Other TBD.</p>	<p>L</p>	<p>\$\$</p>
<p><b>4. Increase education and public outreach related to habitats and living resources</b></p>					

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	<p><b>LR 5-1</b></p>	<p><b><u>Disseminate information to promote an understanding of science-based decision-making in the management of habitats and living resources</u></b></p> <p><b>METRICS:</b> Number of educational materials and reports (<i>e.g.</i>, State of the Bay) distributed; number of science workshops and conferences; pre- and post-program evaluations to measure changes in understanding</p> <p><b>MILESTONES:</b>          5-1a: Inventory existing materials.          5-1b: Develop and distribute new materials as necessary.          5-1c: Provide science workshops/conferences.</p>	<p>Lead(s): BBP</p> <p>Funding Sources: CWA Section 320, DEP State Revolving Funds, EIT; Other TBD.</p>	<p>M</p>	<p>\$</p>
	<p><b>LR 5-2</b></p>	<p><b><u>Develop educational materials, programs, and online resources to promote restoration of habitats and living resources (e.g. living shorelines, shellfish)</u></b></p> <p><b>METRICS:</b> Number of materials/resources developed, number distributed, number of programs and people reached, program evaluations</p> <p><b>MILESTONES:</b>          5-2a: Inventory existing programs and materials/resources.          5-2b: Identify needs and target audiences.          5-2c: Develop and distribute new materials/resources as needed.          5-2d: Develop and provide new programs as needed.</p>	<p>Partners: ReClam the Bay, NOAA, USEPA, BBP, NJDEP</p> <p>Lead(s): BBP</p> <p>Funding Sources: CWA Section 320, DEP State Revolving Funds, EIT; Other TBD.</p>	<p>M</p>	<p>\$</p>
	<p><b>LR 5-3</b></p>	<p><b><u>Develop materials, programs, and online resources to educate about the functional role of critical bay habitats, such as seagrass beds and wetlands, and the early life stages of estuarine-dependent species.</u></b></p>	<p>Partners: BBP, JC NERR, USEPA, NJDEP</p>	<p>S</p>	<p>\$</p>

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		<p><b>METRICS:</b> Number of educational materials/resources developed, number distributed, number of programs and people reached, program evaluations</p> <p><b>MILESTONES:</b>          5-3a: Inventory existing materials/resources.          5-3b: Identify needs and target audiences.          5-3c: Develop and distribute new materials/resources as needed.          5-3d: Develop and provide new programs as needed.</p>	<p>Lead(s): BBP, JCNERR</p> <p>Funding Sources: CWA Section 320, NOAA, DEP State Revolving Funds, EIT; Other TBD.</p>		
	<b>LR 5-4</b>	<p><b><u>Produce educational materials and online resources about the impacts of climate change on the living resources of the bay.</u></b></p> <p><b>METRICS:</b> Number of educational materials/resources produced, number distributed, number of people reached</p> <p><b>MILESTONES:</b>          5-4a: Inventory existing materials/resources.          5-4b: Identify needs and target audiences.          5-4c: Develop and disseminate new materials/resources as needed.</p>	<p>Partners: BBP, JC NERR</p> <p>Lead(s): BBP, JCNERR</p> <p>Funding Sources: CWA Section 320, NOAA, DEP State Revolving Funds, EIT; Other TBD.</p>	M	\$
	<b>LR 5-5</b>	<p><b><u>Promote an improved understanding of the economic and ecological importance of fisheries through fisheries programs and activities.</u></b></p> <p><b>METRICS:</b> Number of fisheries programs/activities, number of people reached, program evaluations</p> <p><b>MILESTONES:</b>          5-5a: Inventory existing programs/activities.</p>	<p>Partners: NOAA, NJDEP</p> <p>Lead(s): NOAA</p> <p>Funding Sources: NOAA, DEP State Revolving</p>	S	\$

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		<p>5-5b: Identify needs and target audiences.</p> <p>5-5c: Develop new programs/activities as needed.</p>	<p>Funds, EIT; Other TBD.</p>		
	<p><b>LR 5-6</b></p>	<p><b><u>Promote education and enforcement of regulations and best practices for responsible use of ecologically sensitive and target areas (e.g., personal watercraft and boating, off-road vehicles)</u></b></p> <p><b>METRICS:</b> Number of educational materials/online resources developed, number distributed, number of programs/people reached, program evaluations</p> <p><b>MILESTONES:</b>          5-6a: Inventory existing programs and materials/resources.</p> <p>5-6b: Identify needs (e.g., shallow water habitat management plan, see <a href="http://nmsfloridakeys.blob.core.windows.net/floridakeys-prod/media/archive/sac/othermaterials/20160419boatingimpacts.pdf">http://nmsfloridakeys.blob.core.windows.net/floridakeys-prod/media/archive/sac/othermaterials/20160419boatingimpacts.pdf</a>) and target audiences (e.g., off-road vehicle drivers).</p> <p>5-6c: Develop and distribute new materials/resources as needed.</p> <p>5-6d: Develop and provide new programs as needed.</p>	<p>Partners: NJDEP, USEPA, NJSGC, Ocean County Tourism, Parks &amp; Planning Depts, JCNERR, BBP (including committees), Land Conservancies, Marine Trades Association, PPA</p> <p>Lead(s): NJDEP, Others TBD.</p> <p>Funding Sources: NJDEP, County NLT funds, DEP State Revolving Funds, EIT; Other TBD.</p>	<p>M</p>	<p>\$\$-</p>