# Piscataqua Region Estuaries Partnership
# Comprehensive Conservation and Management Plan Update

## Stakeholder Input and Meeting Summary Report
## June 2009

**Prepared by**

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**for**

**Piscataqua Region Estuaries Partnership**

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# Introduction

The Piscataqua Region Estuaries Partnership (PREP) is part of the U.S. Environmental Protection Agency's (EPA) National Estuary Program, which is a joint local/state/federal program established under the Clean Water Act. PREP's goal is to protect and restore the Great Bay Estuary watershed and Hampton-Seabrook Estuary watershed. The organization receives its funding from the EPA and is administered by the University of New Hampshire.

PREP will complete its update of the Comprehensive Conservation and Management Plan (CCMP) in early 2010. The first CCMP was released in 2000 when the organization was the New Hampshire Estuaries Project (NHEP). The NHEP management committee and a CCMP project team guided development of the 2000 CCMP. This working group was made up of agency representatives, university researchers, municipal employees and board members, representatives of environmental organizations, and other interested parties. A brief update of the plan was published in 2005.

The purpose of the 2010 CCMP update is to focus organizational efforts on the most pressing current issues and to anticipate needs that may appear over the next decade. The plan update is engaging members of the 42 New Hampshire communities and the 10 Maine communities that lie within PREP's focus area. The Maine communities were added to the organization's service area on January 1, 2008. Figure 1 shows the PREP communities and watershed boundaries; the watersheds for the Hampton-Seabrook Estuary, the Great Bay Estuary, and NH's Atlantic coast are included in the focus area.

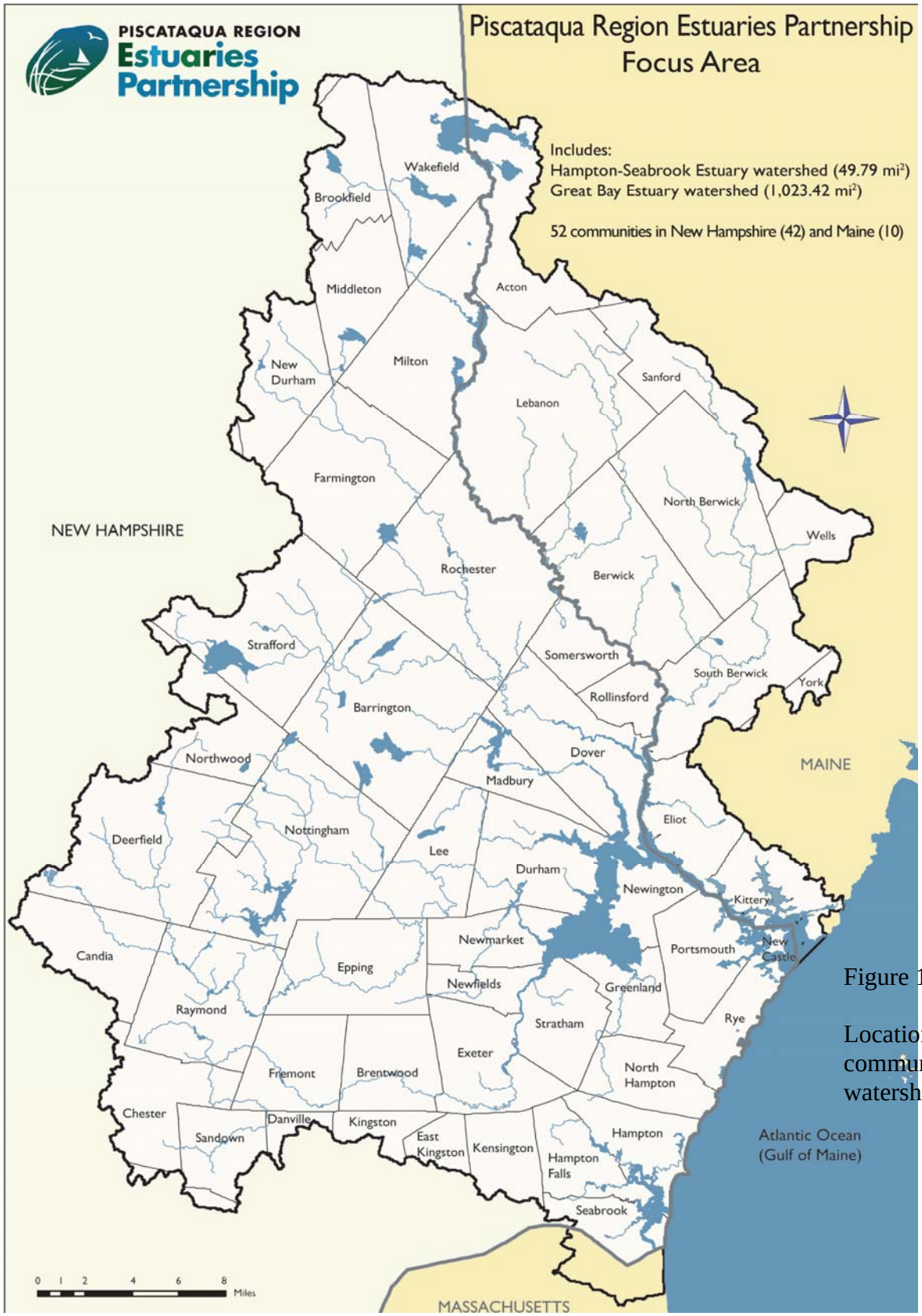


Figure 1 –

Location of stakeholder communities and watershed boundary

The project team of Danna Truslow and Jack Mettee (referred to below as the Truslow Team) was hired by PREP to facilitate stakeholder meetings, manage the update process, and prepare the final CCMP report. Following is a brief report of the stakeholder meetings and outcomes undertaken as part of the CCMP plan development. The process of goal, objective and action selection is detailed and the criteria used to prioritize actions for future planning is explained. Supporting materials are included in the appendices.

## Theme Areas

At the beginning of the CCMP update process, PREP staff prepared preliminary goals and objectives for the new plan. The goals focused on four theme areas:

- Water Resources (WR)
- Living Resources and Habitat Restoration (LR)
- Land Use and Habitat Protection (LU)
- Watershed Stewardship (WS)

The Water Resources theme area focuses on water quality and quantity in the watershed. The Living Resources and Habitat Restoration theme focuses on assessing and restoring the habitats that support freshwater and estuarine species within the watershed. The Land Use and Habitat Protection theme focuses on developing and promoting land use practices that protect watershed resources. The broader Watershed Stewardship theme is focused on educating key stakeholders about estuarine resources and protection and working with organizations, municipalities, state and federal government on policies and regulations that protect watershed resources.

## Stakeholder Involvement Process

In order to get the maximum involvement of stakeholders in the CCMP update, several means of communication were used. Email contact lists already used for communicating monthly PREP news and grant opportunities were used to advertise the process and upcoming meetings. The Management Committee was asked to recommend contact names as well. PREP also established a Wiki site (http://ccmp-update.wikispaces.com/) to publish meeting materials and gather meeting attendance lists. This site also allows stakeholders to comment on existing materials or

provide new information for use in the process. Finally, many stakeholders were contacted directly for additional information and suggestions.

A series of three meetings was held for each of the three theme areas for a total of nine stakeholder meetings. Additionally, three meetings were held or are planned with New Hampshire and Maine agencies involved with protection of marine, estuarine, freshwater and land resources. Table 1 lists the date and location for these meetings.

**Table 1 – Stakeholder and agency meetings**

| Theme Area | Meeting 1 | Meeting 2 | Meeting 3 |
|---|---|---|---|
| Water Resources | January 7, 2009<br>9am – 12 pm<br>NHDES Coastal Office<br>Portsmouth, NH | February 19, 2009<br>9 am – 12 pm<br>Urban Forestry Center<br>Portsmouth, NH | April 1, 2009<br>1 – 4 pm<br>New Hampshire Fish and Game Office<br>Durham, NH |
| Living Resources and Habitat Restoration | February 4, 2009<br>9am – 12 pm<br>Rockingham County Cooperative Extension<br>Brentwood, NH | March 19, 2009<br>9am – 12 pm<br>NHDES Coastal Office<br>Portsmouth, NH | April 29, 2009<br>1 – 4 pm<br>Urban Forestry Center<br>Portsmouth, NH |
| Land Use and Habitat Protection | March 5, 2009<br>9am – 12 pm<br>Exeter Public Library<br>Exeter, NH | April 1, 2009<br>1 – 4 pm<br>Great Bay Discovery Center<br>Stratham, NH | May 21, 2009<br>9am – 12 pm<br>Laudholm Farm<br>Wells, ME |

| | |
|---|---|
| New Hampshire Department of Environmental Services | May 27, 2009<br>NHDES Office – Concord, NH |
| New Hampshire Fish and Game Department | June 2, 2009<br>NHFG Office – Durham, NH |
| Maine resource agencies | July 14, 2009<br>Hallowell, Maine |

**Meeting 1**

The first meeting, in the series of three for each theme area, was an introduction to the CCMP update process and included review of draft goals and objectives. After brief introductions by participants, stakeholders broke into groups and a guided small group facilitation session was conducted with each group to develop indicators that could be used to assess watershed health. Then, participants came together to make comments and suggestions on the goals and objectives that PREP was proposing.

During all meetings, volunteer scribes from the UNH Natural Resources Department, the Truslow team, and PREP staff took notes. After each meeting, notes were summarized with a list of indicators and actions, as well as suggested changes to the draft goals and objectives. After staff review, revised goals and objectives were developed.

**Meeting 2**

The second meeting for each theme area focused on development of actions and included review of revised goals and objectives. After introductions, groups were divided and a guided action brainstorming session was conducted; groups re-convened and discussed possible actions. Participants provided further suggestions on goals and objectives at that time. Summary notes and action lists were prepared after each meeting. PREP staff also developed a spreadsheet tool to track current goals and objectives and actions identified during the meeting process.

**Meeting 3**

The third stakeholder meeting was held to prioritize the actions developed during Meetings 1 and 2, as well those suggested on the Wiki site and through direct solicitation of actions by PREP and the Truslow team. A PREP Management Committee brainstorming session in March 2009 also resulted in a number of possible actions. All these actions were tabulated under the appropriate objective for distribution to participants.

During the first ranking meeting (Water Resources theme, April 1, 2009), participants were asked to rank each action from 1 to 5, with 1 being the least important to 5 being the most important. They were asked to rank the action by not comparing it to other actions within the objective or the theme area but only on its own merits. After questions on the ranking process, individuals ranked the actions and were then divided in small groups of 5 to 8 to discuss them. If they wanted to do so, individuals could change their score based on these discussions. Truslow team staff then tallied ranking sheets and mean, median and mode were calculated for each action. After ranking sheets were tallied, a short summary and discussion of the rankings was conducted.

Comments after the first meeting suggested that more guidance on ranking would be helpful. The ranking process was modified to include a list of considerations for ranking (Table 2). In addition, the Truslow Team in conjunction with PREP staff edited the actions more thoroughly before preparing the final action-ranking list for the last two meetings on the themes of Living Resources and Habitat Restoration and of Land Use and Habitat Protection.

As time allowed during tallying at these meetings, participants were invited to comment on partially completed action plans or to develop action plans for one or more actions. An example of the action plan format is included in Appendix A.

**Action statistical analysis, ranking, and refinement**

After the meetings were complete, statistical distributions of mean action rankings were calculated for each theme area. Based on the means and ranges, categories of Highest, High and Priority were assigned for each theme area and actions were ranked accordingly. Actions were sorted within their theme area, from highest to lowest, based on their mean ranking.

Comments offered on goals, objectives, actions and action plans during the meetings were also compiled but are not included in this report. Goals, objectives and actions were refined from the comments. The revised goals and objectives in this document reflect the comments from stakeholders and from agency meetings with New Hampshire Department of Environmental Services and New Hampshire Fish and Game Department. (The Maine agency meeting had not been held before the completion of this summary report.)

**Watershed Stewardship action refinement**

Watershed Stewardship actions were not ranked, but were added to and edited during the ranking process by Truslow team and PREP staff. Further refinement of actions will be carried out during the CCMP action plan development process.

## Table 2 - Considerations for setting priorities:

- Please make an effort to use the full range of rankings when considering each action; going for the middle may result in an overall ranking that does not provide a clear distinction between actions.

- Initially rank plans based on your own knowledge/perceptions; you can re-rank after some group discussion, if desired. Even if you do not have complete knowledge of all the factors, still assign a ranking based on what you think

For purposes of ranking, we recommend you consider the following criteria:

- ✓ **Potential environmental benefit or ability to achieve the desired objective** (i.e., if the action plan is successfully implemented, what's the likelihood of it achieving the objective or producing significant long-term environmental benefits?)

- ✓ **Cost of implementation** (i.e., budget will be a consideration; so if a lower cost action plan can achieve the same outcome as a higher cost one, the lower cost one should be a higher priority, unless there is a dedicated funding source or funding opportunity unique to the higher cost action plan)

- ✓ **Feasibility of implementation** (i.e., is it realistic, is there precedence, is there support for it where needed, is there capacity to do it?)

- ✓ **Linkage to measurable results/outcomes** (i.e., is there an outcome for the action plan that is clear and well-defined? Will we know when we're done implementing the action plan?)

# Results of Stakeholder Meetings

## Stakeholders

Ninety-eight unique stakeholders attended the nine stakeholder meetings and are listed with their affiliation in Appendix B. Volunteers from municipal conservation commissions and planning boards, watershed association members, citizen interest and monitoring groups, municipal employees, representatives from local land trusts and conservation organizations, commercial fisherman, consultants, and state and federal agency representatives were among the attendees. The Land Use and Habitat Protection theme meetings had the highest attendance, 68; followed closely by Water Resources, 64; Living Resources and Habitat Restoration meetings had a total of 34 attendees.

The NHDES meeting was attended by the NHDES Commissioner and seven program managers within NHDES. The Marine Division director and staff, including the Great Bay National Estuarine Research Reserve, attended the NHFG meeting. Staff from six different resource agencies has been invited to the upcoming Maine agencies meeting.

## Goals and objectives

The comments during the stakeholder meeting process offered new insights and helped to further refine goals and objectives. Some of the significant refinements were in the areas of climate change impacts, revisions to measurement of indicator species and habitats, groundwater contributions to estuarine resources and the importance of small streams and wetlands. Additional target species were added to the objectives, in particular salt marsh breeding birds and juvenile marine fish species that mature in estuarine environments. There are two Water Resources goals, one Living Resources and Habitat Restoration goal, three Land Use and Habitat Protection goals and one Watershed Stewardship goal.

The working goals are listed below by theme area; with corresponding objectives for each goal. The order of the goals and objectives does not reflect a ranking by importance.

## WATER RESOURCES

**Goal 1: Water quality in the Piscataqua region watersheds supports shellfish harvesting, recreation, aquatic life, and drinking water consistent with the Clean Water Act, and existing high quality waters are maintained at 2010 conditions.**

WR-1.1 Improve water quality and identify and mitigate pollution sources so that additional estuarine areas meet water quality standards for bacteria for shellfish harvesting.

WR-1.2 Minimize coastal beach closures due to failure to meet water quality standards for bacteria in the estuaries and the ocean.

WR-1.3 Reduce nutrient loads to the estuaries and the ocean so that adverse, nutrient-related effects do not occur.

WR-1.4 Reduce sediment loads to the estuaries and the ocean so that adverse, sediment-related effects do not occur.

WR-1.5 Monitor and reduce loading of toxic contaminants including emerging contaminants and pathogens.

WR-1.6 Improve the water quality in streams, rivers and lakes to support recreation, aquatic life, and drinking water throughout the watersheds and maintain high quality fresh waters at 2010 conditions.

**Goal 2: Quantities of freshwater in rivers and aquifers throughout the Piscataqua region watersheds are appropriate for humans, aquatic species, riparian wildlife, and riparian vegetation.**

WR-2.1 Maintain instream flows and groundwater levels that support aquatic life and recreation, human populations, and the hydrologic integrity of coastal streams and rivers.

WR-2.2 Minimize catastrophic flooding due to development and climate change.

WR-2.3 Restore or maintain geomorphologically balanced river systems.

## LIVING RESOURCES AND HABITAT RESTORATION

### Goal 1: Ecological function, connectivity, resilience, biodiversity, and ecosystem services of habitats are maintained and restored throughout the Piscataqua region watersheds.

LR-1.1 Increase the abundance of adult oysters at the six documented beds in the Great Bay Estuary to 10 million oysters by 2020.

LR-1.2 Increase the number of adult clams in the Hampton-Seabrook Estuary to 5.5 million clams by 2020.

LR-1.3 Increase the aerial extent of eelgrass cover to 2,900 acres and restore connectivity of eelgrass throughout the Great Bay Estuary by 2020.

LR-1.4 Restore native diadromous fish access to 50 percent of their historical mainstem river distribution range by 2020, and improve habitat conditions encountered throughout their life cycle.

LR-1.5 Continue to identify existing populations of native Eastern brook trout and protect the integrity of the subwatersheds that support them.

LR-1.6 Maintain a stable and diverse population of shorebirds and saltmarsh breeding birds in Piscataqua Region estuaries.

LR-1.7 Inventory, evaluate and restore natural vegetative buffers along degraded reaches of tidal shorelands, riparian zones of all stream orders, and wetlands.

LR-1.8 Identify and address stream and shoreline modifications that have significant negative impacts on the physical, chemical, or biological integrity of waterways.

LR-1.9 Identify vulnerabilities of upland and aquatic habitats to anticipated climate change impacts and take appropriate actions to mitigate or adapt to impacts.

LR-1.10 Restore or enhance an additional 300 acres of salt marsh by 2020 through tidal restriction removal and invasive species management.

LR-1.11 Monitor and control the extent of invasive nuisance species throughout the Piscataqua region watershed and estuaries.

LR-1.12 Minimize impacts to benthic habitat from direct alterations to submerged lands.

LR-1.13 Restore degraded natural freshwater wetlands and priority upland habitats.

LR-1.14 Protect and restore estuarine habitats for juvenile fish populations to support regional marine management plans.

## LAND USE AND HABITAT PROTECTION

### Goal 1: Development patterns and practices protect watershed and estuarine water quality and quantity.

LU-1.1 Promote sustainable land use practices in new development and redevelopment of existing sites.

LU-1.2 Promote regional strategies for consistent use of ecologically protective development standards across the Piscataqua region watersheds.

### Goal 2: Ecosystem functions and services provided by tidal and freshwater wetlands, floodplains, streams and shorelands are maintained.

LU-2.1 Protect floodplains, wetlands, shorelands and associated fluvial erosion hazard zones to maintain their function and value.

LU-2.2 Improve protections for small streams through regulatory and other means.

### Goal 3: Critical upland areas support viable plant and animal communities and provide watershed services to improve aquatic habitats and water quality.

LU-3.1 Implement the Land Conservation Plan for New Hampshire's Coastal Watersheds and Southern Maine's regional land conservation plan, as well as and protect 75 percent of lands identified as Conservation Focus Areas by 2025.

LU-3.2 Implement strategies from the NH Wildlife Action Plan, NHFG Connectivity Model and Maine's Beginning with Habitat Program to protect key species at risk and critical habitats identified in those plans.

LU-3.3 Protect the quality of current and future drinking water supplies through land protection and other activities.

LU-3.4 Implement permanent land protection activities to protect high value farmlands.

LU-3.5 Encourage land protection and land stewardship through local and regional land protection organizations.

## WATERSHED STEWARDSHIP

### Goal 1: Legislative, resource management, and land use planning decisions and processes affecting the Piscataqua region watersheds support Management Plan goals and objectives.

WS-1.1 Promote the economic and environmental value of ecosystem services and functions that support healthy estuarine systems and coastal watersheds to citizens and state and local decision-makers.

WS-1.2 Provide access to science-based information about Piscataqua region estuaries and watersheds to coastal watershed decision-makers.

WS-1.3 Improve state and local capacity to enforce measures that protect and restore aquatic habitats in PREP focus area.

**Ranking actions**

All the actions that were used in the rankings are included in Appendix C-1 through C-3; they number 189 and came from stakeholder and management committee meetings, stakeholder comments on the Wiki, stakeholder conversations, and the existing Management Plan. The Water Resources theme included 93 actions, which were minimally edited prior to ranking. Actions for the Living Resources and Land Use themes were reviewed and edited prior to ranking; their totals were 46 and 50 respectively.

To prioritize each action, the action was given a score based on input from stakeholders; data are summarized in Appendix D and further categorized below in Table 3. The resulting highest-ranked actions are listed in Tables 4a, 4b, and 4c on pages 19 to 21; Table 5 is a summary of major issues of concern with the number of "highest"-ranked actions, within each theme area.

**Table 3 – Actions scored into highest, high and priority ranges**

| Theme Area | "Highest" Mean Ranking Score | "High" Mean Ranking Score | "Priority" Mean Ranking Score |
|---|---|---|---|
| Water Resources | 4.2 to 5.0 | 3.4 to 4.1 | 2.4 to 3.3 |
| Living Resources and Habitat Restoration | 4.0 to 5.0 | 3.0 to 3.9 | 2.0 to 2.9 |
| Land Use and Habitat Protection | 4.4 to 5.0 | 3.7 to 4.3 | 3.1 to 3.6 |

**Summary of "highest" ranking actions**

In the Water Resources theme area, 21 actions ranked as highest priority out of the 93 suggested. The highest ranked action was the adoption of NHFG road crossing guidelines to assist with culvert upgrades and replacements. Of the 21 actions there were three stormwater and three river function related actions. There were two each of nutrient, water supply and bacteria related actions. Other highly ranked actions addressed groundwater quality, water quality monitoring, reduction of sedimentation, and waste collection and reduction.

In the Living Resource and Habitat Restoration area, 10 ranked as highest priority out of the 46 edited actions. The highest ranked actions included oyster and clam bed restoration, nutrient removal, control of invasive plants, marsh restoration, inundation mapping, dam removal and stream crossing restoration, and habitat protection.

In the Land Use and Habitat Protection area, 16 actions out of 50 edited actions ranked as highest. Supporting and providing assistance for local land protection organizations and conservation commissions ranked highest. Other actions ranking highest were protection of high value wetlands, migration corridors, and drinking water protection areas, minimization of impervious cover and off site impacts from development, enforcement of existing land use regulations, protecting stream buffers and supporting the NROC and NEMO assistance programs.

**Watershed Stewardship actions**

Appendix C-4 lists the Watershed Stewardship Actions developed during the stakeholder outreach and meeting process. Actions include evaluating the economic value of watershed services, providing science based education and training for citizens and decision makers and supporting the agencies that implement the PREP management plan.

## Next Steps

The next steps in furthering the development of goals, objectives and actions include:

- Incorporation of stakeholder and agency comments in actions and action plans
- PREP review of goals and objectives, as well as the prioritized actions, to assure compliance with its mission
- Combining similar actions to avoid redundancy in the plan
- Development of detailed action plans for each selected action

Assembled into the 2010 Comprehensive Conservation and Management Plan will be background on the plan development process, PREP's mission and progress on estuarine quality, key watershed issues, as well as goals, objectives and detailed action plans. Stakeholders will

have the opportunity to comment during the draft review process and on the Wiki site prior to plan completion early in 2010.

**Table 4a – Highest ranked Water Resource actions from stakeholder meetings**

| |
|---|
| Encourage communities to adopt the NHF&G Stream Crossing Guidelines as the communities' standard for stream crossings. If they adopt and implement this standard, FEMA may approve upgrades to failed culverts (disaster declaration needed). |
| Complete instream flow studies and establish instream flow withdrawal limits for all coastal rivers |
| Support the development and implementation of water resource management plans to determine sustainable groundwater and surface water use in the coastal watershed. |
| Promote the use of stormwater best management practices that remove nitrogen |
| Encourage infiltration of wastewater and stormwater for groundwater recharge |
| Eliminate sewer and storm drain illicit connections |
| Promote nutrient limits for NPDES permits for all the municipal wastewater treatment facilities in the Piscataqua Region watershed |
| Regularly monitor water quality for indicators of human and animal wastes and pollution sources in shellfish growing areas |
| Promote PPCP collection programs in the Piscataqua Region watershed |
| Maintain or re-establish floodplains to protect habitat, sediment and nutrient attenuation, and flood prevention attributes |
| Promote source water protection programs for public drinking water supplies in the Piscataqua Region watershed |
| Implement the requirements of the Protected Rivers Management Act (RSA 483) by assisting LACs conduct geomorphic assessments to serve as a basis for watershed/corridor management plans authorized under RSA 483:10 |
| Locate, eliminate, and prevent groundwater contamination. |
| Promote collaboration of state and local officials to locate and eliminate illegal discharges into surface waters |
| Identify sources of and reduce or eliminate toxic contaminants in the coastal watershed. |
| Implement National Shellfish Sanitation Program guidance to maintain a FDA-certified shellfish program |
| Increase funding for wastewater treatment facilities for nutrient removal |
| Reduce or eliminate contaminants from pollution sources affecting shellfish growing areas |
| Identify high priority stream corridor protection and restoration opportunities to support sediment reduction |
| Develop programs to encourage water conservation |
| Develop watershed-based management plans for tidal beaches that include septic system management plans. Plans will be based on storm water modeling to be completed by DES by May 2009. The goal is to reduce or eliminate contaminants from pollution sources affecting beaches. |

**Table 4b – Highest ranked Living Resources and Habitat Protection actions from stakeholder meetings**

| |
|---|
| Implement a comprehensive recovery plan for native oyster populations in Great Bay. |
| Support the Coastal Watershed Invasive Plant Partnership's efforts to control terrestrial and wetland invasive plants. |
| Identify and implement salt marsh restoration and enhancement projects. |
| Advocate for the removal of non-essential dams on coastal streams and rivers, with a priority emphasis on dams located within the natural zone of tidal influence. |
| Develop a clam bed management plan for the Hampton Seabrook Estuary. |
| Develop a plan and support control of nitrogen entering estuarine areas. |
| Work with DES Wetlands Program to increase mitigation ratios and/or in lieu mitigation fees required when permitting impacts to smaller, higher quality wetlands (i.e. vernal pools) or wetland that are very difficult to replace (forested wetlands, bogs, etc.) |
| Work with partners to acquire high-resolution LIDAR datasets for the entire coastal block for accurate inundation modeling. |
| Identify undeveloped land adjacent to Piscataqua Region estuaries that can be protected through purchase, easements, or regulation to allow shoreline and marsh migration in response to sea level rise. |
| Conduct stream/road crossing inventories in all estuarine tributaries to identify and fix crossings that are fish passage barriers or have significant negative impacts on the physical, chemical, or biological integrity of waterways. |

**Table 4c – Highest ranked Land Use and Habitat Protection actions from stakeholder meetings**

| |
|---|
| Support and provide technical assistance for local and regional land protection organizations and conservation commissions |
| Fund and promote ongoing landscape scale ecosystem based stewardship management planning and implementation |
| Identify and protect highest value wetlands within Piscataqua Region watersheds |
| Develop municipal ordinances to protect buffers for first, second and third order streams |
| Minimize impervious cover in new development |
| Promote regulations that minimize off-site impacts from development activity |
| Add a linkage plan to the Coastal Conservation Plan (CCP) |
| Promote, expand and develop a dedicated funding source for Drinking Water Land Protection Programs. |
| Promote site development strategies that protect key natural areas from adverse impacts |
| Improve enforcement of state and local land use regulations that protect natural resources |
| Support NROC and NEMO land use planning outreach program and encourage continued improvement of this program. |
| Update land use regulations to reflect LID techniques and principles |
| Implement and enforce provisions of the NH Comprehensive Shoreland Protection Act and the Maine Mandatory Shoreland Zoning Act. |
| Develop education for landowner, planning boards and conservation commissions regarding 1st order streams and why they are important to protect |
| Improve specifications for bridge and culvert design for aquatic activity, hydrologic connectivity |
| Permanently protect North-South and East-West migration corridors |

## Table 5 – Highest ranked actions classified by issue of concern and theme area

| Issue of Concern | Theme Area | Action/Application | # of highest actions |
|---|---|---|---|
| Shellfish | Living Resources | Oyster restoration | 5 |
| | Living Resources | Clam bed management | |
| | Water Resources | Shellfish Sanitation Program | |
| | Water Resources | Reduce contaminants affecting shellfish growing | |
| | Water Resources | Water quality monitoring | |
| Invasive Species | Living Resources | Coastal WIPP - control | 2 |
| | Living Resources | Saltmarsh restoration | |
| Wetlands | Living Resources | Saltmarsh restoration | 5 |
| | Living Resources | Mitigation ratios | |
| | Living Resources | Protection of marsh migration | |
| | Living Resources | Inundation mapping | |
| | Land Use | Protect high value wetlands | |
| Wastewater/nutrients | Living Resources | Reduce nitrogen loads | 7 |
| | Water Resources | Stormwater BMPs | |
| | Water Resources | Wastewater and Stormwater infiltration | |
| | Water Resources | Eliminate illicit/illegal connections or discharges | |
| | Water Resources | Nutrient limits for WWTPs | |
| | Water Resources | Maintain floodplains for nutrient removal | |
| | Water Resources | WWTP nutrient removal | |
| River/floodplain management | Living Resources | Land protection for areas of marsh/floodplain migration | 4 |
| | Water Resources | Instream flow limits on all coastal rivers | |
| | Water Resources | Maintain-re-establish floodplain | |
| | Water Resources | Geomorphic assessments for management planning | |
| Road/stream crossings | Living Resources | Inventory crossings to ID barriers | 3 |
| | Water Resources | Adopt NHFG guidelines for FEMA funded replacement | |
| | Land Use | Improve specs for bridges and culverts to design for aquatic connectivity | |

| Subject | Theme Area | Application | Number of actions |
|---|---|---|---|
| Drinking water | Water Resources | Sustainable water use - management plans | 4 |
| | Water Resources | Source water protection for all DW supplies | |
| | Land Use | Expand and fund drinking water land protection | |
| | Land Use | Water conservation | |
| Contaminants (not nutrient-specific) | Water Resources | PPCP monitoring and waste collection | 5 |
| | Water Resources | Groundwater contamination | |
| | Water Resources | Toxic contaminants | |
| | Water Resources | Shellfish pollution sources | |
| | Land Use | Stream buffer restoration to prevent sedimentation | |
| Land Protection Support and Protection | Land Use | Support and Provides Assist for LP orgs and con coms | 7 |
| | Land Use | Ecosystem based stewardship and LP | |
| | Land Use | Protect high value wetlands | |
| | Land Use | Expand and fund drinking water land protection | |
| | Land Use | Protect migration corridors | |
| | Land Use | Add linkages to conservation plans | |
| | Land Use | Support NROC and NEMO programs | |
| Low order streams | Land Use | Education to citizens and boards about importance of 1st order streams | 3 |
| | Land Use | Protect buffers for 1st, 2nd and 3rd order streams | |
| | Land Use | Stream buffer restoration to prevent sedimentation | |
| Enforcement of regulations | Land Use | Improve enforcement of regulation that protect natural resources | 2 |
| | | Enforce shoreland protection | |
| Development impacts | Land Use | Reduce/minimize impervious cover | 4 |
| | Land Use | Minimize off-site impacts | |
| | Land Use | Add LID to land use regulations | |
| | Land Use | Protect natural areas from dev. Impacts | |

# Appendices

**Appendix A. Example Action Plan**

## Piscataqua Region Estuaries Partnership

## Action Plan

**Theme Area-**

**Action Number**

**Action Description**

**Priority - TBD**

**Background Information**

**Activities/Tasks**

1.

2.

3.

**Responsible Parties**

**Implementation Location**

**Estimated Costs - High ☐ Medium ☐ Low ☐**

**Funding sources**

**Expected Outputs and Outcomes**

**References**

## Appendix B. List of Stakeholders at CCMP Meetings

| *Attendee* | *Affiliation* |
|---|---|
| Amanda Stone | UNH Cooperative Extension |
| Barbara Pinto Mauer | Gundalow Company |
| Ben McDougall | Town of York |
| Bev Hollingworth | NH Executive Council |
| Bill Arcieri | VHB Consulting |
| Bobbi Atkinson | Eliot Conservation Commission |
| Brian Giles | Lamprey River Local Advisory Council |
| Candace Dolan | Hodgson Brook Watershed Association |
| Carolyn Matthews | Raymond, NH |
| Cheryl Killam | Town of Raymond Conservation Commission |
| Chris Fuert | Wells National Estuarine Research Reserve |
| Chris Keeley | UNH student |
| Chris MacClinchy | Southern Maine Regional Planning Commission |
| Chris Nash | NH Dept. of Environmental Services Shellfish Program |
| Christine MacGruder | Great Works Regional Land Trust |
| Chuck Gilboy | Congresswoman Shea-Porter's office |
| Cliff Sinnott | Rockingham Planning Commission |
| Colin Lawson | Antioch College |
| Connie Weeks | Eliot Conservation Commission |
| Cynthia Copeland | Strafford Regional Planning Commission |
| Dan Kern | Bear Paw Regional Greenways |
| Dari Ward | Great Bay Coast Watch |
| Dave Funk | Great Bay Stewards |
| Dave Gentile | Exeter River Local Advisory Committee |
| Dave Burdick | UNH Jackson Estuarine Laboratory |
| Dea Brickner Wood | Great Bay Resource Protection Partnership |
| Deborah Zarta Gier | NHSC, Inc. |
| Don Clement | Exeter River Local Advisory Committee |
| Don Kale | Maine Dept. of Environmental Protection |
| Don Woodard | Exeter River Local Advisory Committee |
| Doug Bogen | Clean Water Action |
| Duane Hyde | The Nature Conservancy |
| Elizabeth Fairchild | UNH Zoology Dept. |
| Ellen Goethel | Hampton Conservation Commission |
| Felicia Giordano | Public Service of New Hampshire |
| Fred Short | UNH Jackson Estuarine Lab |
| Glenn MacWilliams | York Planning Board |
| Helen Winebaum | York Land Trust |
| Hillary Behr | UNH Student |
| Jahnay Pickett | UNH Office of Sponsored Research |
| Jamie Oman-Saltmarsh | Southern Maine Regional Planning Commission |
| James Houle | UNH Stormwater Center |
| Jean Brochi | US Environmental Protection Agency |

| *Attendee* | *Affiliation* |
|---|---|
| Jean Eno | Greenland Conservation Commission |
| Jeff Andrews | NH Dept. of Environmental Services |
| Jeff Barnum | Coastal Conservation Association of NH |
| Jeff Winders | Rochester Conservation Commission |
| Jeremy Tomkiewicz | UNH M.S. Student |
| Jodi Castallo | Mt. A to the Sea Conservation Initiative |
| John Merrill | Stratham, NH |
| Ken Ortmann | City of Rochester |
| Kevin Lucey | NH Dept. of Environmental Services |
| Laura Deming | NH Audubon |
| Laurel Cox | Oyster River Watershed Association |
| Leonard Lord | VHB Consulting |
| Linda Schier | Acton Wakefield Watershed Association |
| Lorie Chase | Cocheco River Watershed Coalition |
| Mark Arenberg | City of Rochester Public Works |
| Mark West | Bear Paw Regional Greenways |
| Mark Zankel | The Nature Conservancy |
| Mel Cote | US Environmental Protection Agency |
| Michelle Daley | NH Water Resource Research Center |
| Mike Speltz | Society for the Protection of New Hampshire's Forests |
| Mitch Kalter | Great Bay Trout Unlimited / Coastal Conservation Assoc. of NH |
| Nancy Farron | Community Wellness Coalition - KEYS Region, Maine |
| Nicole Whitney | UNH Student |
| Pam Hunt | NH Audubon |
| Patti Gentile | Exeter River Local Advisory Committee |
| Paul Currier | NH Dept. of Environmental Services |
| Paul Dest | Wells National Estuarine Research Reserve |
| Paul Susca | NH Dept. of Environmental Services |
| Pete Richardson | Exeter River Local Advisory Committee |
| Peter Britz | City of Portsmouth |
| Peter Tilton | Defiant Lobster |
| Phyllis Ford | Spruce Creek Association |
| Rachel Kelly | Southern New Hampshire Planning Commission |
| Ray Konisky | The Nature Conservancy |
| Robert Roseen | UNH Stormwater Center |
| Ruta Dzenis | Maine State Planning Office |
| Sally Soule | NH Dept. of Environmental Services |
| Sharon DesJardins | UNH Office of Sponsored Research |
| Steve Couture | NH Dept. of Environmental Services |
| Steve Jones | UNH Jackson Estuarine Lab |
| Steve Miller | Great Bay National Estuarine Research Reserve |
| Steven Bedard | UNH student |
| Sue Cobbler | Town of Kittery |
| Sue Foote | Seabrook Conservation Commission |

| *Attendee* | *Affiliation* |
|---|---|
| Sylvia Von Aulock | Town of Exeter |
| Ted Walsh | NH Dept. of Environmental Services |
| Theresa Walker | Rockingham Planning Commission |
| Tin Smith | Wells National Estuarine Research Reserve |
| Tom Fargo | Town of Dover Conservation Commission |
| Torbert MacDonald | Town of York |
| Vanessa Jones | NH Audubon |
| Wallace Berg | Greenland Conservation Commission |
| Wally G. Fries | UNH Marine Docent |
| Wendy Ryan Beagen | UNH Marine Docent |
| Will Brewster | Spruce Creek Association |

List of attendees at agency meetings

| *Meeting* | *Attendees* |
|---|---|
| New Hampshire Department of Environmental Services | Thomas Burack, Paul Susca, Steve Couture, Laura Weit, Harry Stewart, Ted Diers, Paul Currier, Vince Perelli, Phil Trowbridge |
| New Hampshire Fish and Game Department | Rachel Stevens, Steve Miller, Cheri Patterson, Katherine Mills, Kelle Loughlin, Peter Wellenberger, Doug Grout, Bruce Smith, Matt Carpenter, John Wimsatt |
| Maine Agencies | TBD |

## Appendix C-1. Water Resources Actions

| *Action #* | *Action* | *Mean* | *Median* | *Mode* |
|---|---|---|---|---|
| 1.1.1 | Implement National Shellfish Sanitation Program guidance to maintain a FDA-certified shellfish program | 4.3 | 4 | 5 |
| 1.1.2 | Collect and monitor shellfish tissue samples as appropriate for toxins and biotoxins | 4.1 | 4 | 5 |
| 1.1.3 | Eliminate sewer and storm drain illicit connections | 4.5 | 5 | 5 |
| 1.1.4 | Conduct and periodically update shoreline surveys for pollution sources | 3.9 | 4 | 5 |
| 1.1.5 | Promote collaboration of state and local officials to locate and eliminate illegal discharges into surface waters | 4.3 | 5 | 5 |
| 1.1.6 | Provide incentives, including cost-share funding, to fix or eliminate illegal direct discharges such as grey water pipes, failing septic systems, and agricultural runoff | 4.0 | 4 | 5 |
| 1.1.7 | Promote public education about pet waste disposal throughout the watershed | 2.7 | 3 | 3 |
| 1.1.8 | Assist boaters in complying with the requirement for no boat sewage discharges in NH and Maine's coastal waters consistent with the "No Discharge Area" designation | 3.3 | 3 | 3 |
| 1.1.9 | Regularly monitor water quality for indicators of human and animal wastes and pollution sources in shellfish growing areas | 4.5 | 5 | 5 |
| 1.1.10 | Reduce or eliminate contaminants from pollution sources affecting shellfish growing areas | 4.3 | 5 | 5 |
| 1.1.11 | Research bacterial and microbial source tracking techniques and increase capabilities and help with source reduction | 3.8 | 4 | 4 |
| 1.2.1 | Complete bacteria TMDLs for all beaches that close due to bacteria pollution | 3.8 | 4 | 3 |
| 1.2.2 | Correct drainage pipe discharge north of New Castle Beach that drains a human constructed duck pond. | 3.1 | 3 | 2 |
| 1.2.3 | Develop watershed-based management plans for tidal beaches that include septic system management plans. Plans will be based on storm water modeling to be completed by DES by May 2009. The goal is to reduce or eliminate contaminants from pollution sources affecting beaches. | 4.2 | 5 | 5 |
| 1.2.4 | Conduct a GIS inventory and create an integrated network of wastewater and storm water drainage systems for monitoring and trouble shooting | 3.5 | 3.5 | 3 |
| 1.2.5 | Promote public on pet waste disposal and provide receptacles to reduce deposits on beaches | 3.4 | 4 | 4 |

## Appendix C-1. Water Resources Actions (continued)

| *Action #* | *Action* | *Mean* | *Median* | *Mode* |
|---|---|---|---|---|
| 1.3.1 | Ban nitrogen fertilizers in the Piscataqua Region watershed. | 2.3 | 2 | 1 |
| 1.3.2 | Promote nutrient limits for NPDES permits for all the municipal wastewater treatment facilities in the Piscataqua Region watershed | 4.5 | 5 | 5 |
| 1.3.3 | Research the nitrogen cycle in Piscataqua Region watersheds | 3.3 | 3 | 5 |
| 1.3.4 | Research stormwater best management practices that remove nitrogen | 4.1 | 4 | 5 |
| 1.3.5 | Promote the use of stormwater best management practices that remove nitrogen | 4.6 | 5 | 5 |
| 1.3.6 | Certify commercial landscapers that use greener options | 3.1 | 3 | 4 |
| 1.3.7 | Determine the amount of nutrient loading from groundwater discharge to Piscataqua region estuaries. | 2.9 | 3 | 4 |
| 1.3.8 | Identify and prioritize locations with high nutrient stormwater loads for restoration | 3.9 | 4 | 5 |
| 1.3.9 | Increase funding for wastewater treatment facilities for nutrient removal | 4.3 | 5 | 5 |
| 1.3.10 | Promote low impact landscaping "landscaping socials" (Landscaping to the Waters Edge, NH Innovative Land Use Guide) | 3.3 | 3 | 3 |
| 1.4.1 | Conduct fluvial erosion geomorphic assessments in coastal tributaries to identify sediment reduction opportunities, including floodplain access restoration | 4.2 | 4 | 5 |
| 1.4.2 | Improve erosion and sedimentation controls at construction sites in the Piscataqua Region watershed | 4.1 | 4 | 5 |
| 1.4.3 | Conduct research to document potential sediment reductions provided by existing floodplain areas | 3.0 | 3 | 2 |
| 1.4.4 | Conduct research to document potential sediment reductions that can be achieved via floodplain restoration | 3.3 | 3 | 5 |
| 1.4.5 | Identify high priority stream corridor protection and restoration opportunities to support sediment reduction | 4.2 | 4 | 5 |
| 1.5.1 | Identify sources of and reduce or eliminate toxic contaminants in the coastal watershed. | 4.3 | 5 | 5 |
| 1.5.2 | Acknowledge and support the Oil Spill Response Team of the Piscataqua River Cooperative. | 3.5 | 4 | 4 |
| 1.5.3 | Enhance oil spill clean up efforts through pre-deployment of infrastructure and development of high-speed current barriers. | 3.2 | 3 | 3 |
| 1.5.4 | Better understand ways of changing behavior to minimize contaminant impacts | 2.6 | 2 | 2 |
| 1.5.5 | Develop and implement innovative means to reduce loads of chemical de-icers from roadways to the estuary | 3.9 | 4 | 4 |
| 1.5.6 | Promote a certification program for road agents and private contractors who apply deicing chemicals. | 3.3 | 3 | 4 |
| 1.5.7 | Increase household hazardous waste and pollution prevention programs in the Piscataqua Region watershed | 3.2 | 3 | 3 |

## Appendix C-1. Water Resources Actions (continued)

| *Action #* | *Action* | *Mean* | *Median* | *Mode* |
|---|---|---|---|---|
| 1.6.1 | Develop and implement a monitoring program for pharmaceuticals and personal care products in wastewater, lakes, rivers, and the estuaries. | 3.8 | 4.5 | 5 |
| 1.6.2 | Promote PPCP collection programs in the Piscataqua Region watershed | 4.4 | 5 | 5 |
| 1.7.1 | Locate, eliminate, and prevent groundwater contamination. | 4.3 | 5 | 5 |
| 1.7.2 | Establish ongoing training and support for municipal personnel in monitoring storm drainage systems for illicit connections. | 3.9 | 4 | 4 |
| 1.7.3 | Develop model restoration plans for priority pollutants that can be replicated on a subwatershed scale | 3.4 | 4 | 4 |
| 1.7.4 | Promote source water protection programs for public drinking water supplies in the Piscataqua Region watershed | 4.4 | 4 | 5 |
| 1.7.5 | Encourage adoption of subwatershed management plans | 4.1 | 4 | 4 |
| 1.7.6 | Encourage watershed-based permitting for NPDES discharges | 3.6 | 4 | 4 |
| 1.7.7 | Promote the development of TMDL studies for all impaired water bodies in the Piscataqua Region watershed | 3.9 | 4 | 5 |
| 1.7.8 | Targeted outreach and technical assistance to MSGP permittees (NPDES program) in the seacoast that have industrial activities known to discharge pollutants contributing to impairments. | 3.9 | 4 | 3 |
| 1.7.9 | Establish a standard set of metrics (indicators) to be used within the watershed to monitor water quality | 3.6 | 4 | 5 |
| 1.7.10 | Identify and target most polluted storm water discharge and set clean up priorities | | | |
| 1.8.1 | Establish volunteer programs to monitor biological data | 3.9 | 4 | 5 |
| 1.8.2 | Prioritize restoration of water bodies that are failing to meet standards | 4.2 | 4 | 4 |
| 1.8.3 | Upgrade existing water quality monitoring to incorporate macroinvertebrate monitoring | 4.1 | 4 | 5 |
| 1.8.4 | Establish a more stringent requirement for septic systems in the coastal watershed | 4.1 | 5 | 5 |
| 1.8.5 | Identify actions to address municipal barriers to implementing wastewater programs | 3.8 | 4 | 4 |
| 1.8.6 | Improve biosolids management in the Piscataqua Region watershed | 3.1 | 3 | 3 |
| 1.8.7 | Develop a financial assistance program for qualified homeowners to fund septic system upgrades | 3.8 | 4 | 4 |
| 1.8.8 | Improve inspection of on-site septic systems by municipal and state officials and strengthen authority for enforcement | 4.2 | 4.5 | 5 |
| 1.8.9 | Increase the availability of public sewer hook-ups to reduce the number of on-site septic systems (in towns with tidal frontage?) | 3.8 | 4 | 4 |
| 1.8.10 | Research the impacts of on-site wastewater treatment (septic systems) on water quality in the estuaries | 3.7 | 3.5 | 5 |
| 1.8.11 | Research new technologies for on-site septic systems which could be used in the Piscataqua Region watershed | 4.1 | 4 | 5 |

## Appendix C-1. Water Resources Actions (continued)

| *Action #* | *Action* | *Mean* | *Median* | *Mode* |
|---|---|---|---|---|
| 2.1.1 | Locate, quantify and qualify groundwater inflow to the estuaries. | 3.1 | 3 | 3 |
| 2.1.2 | Support the development and implementation of water resource management plans to determine sustainable groundwater and surface water use in the coastal watershed. | 4.6 | 5 | 5 |
| 2.1.3 | Map the current extent of public drinking water distribution systems and POTW collection systems at a scale of 1:24,000 or better, and provide a mechanism for continuous updates, to enable better estimates of water use and its spatial distribution." | 3.1 | 3 | 3 |
| 2.1.4 | Complete instream flow studies and establish instream flow withdrawal limits for all coastal rivers | 4.7 | 5 | 5 |
| 2.1.5 | Develop a 3-D model of groundwater and flow paths in the coastal watershed (Model by USGS only covered immediate coastal drainage area. Essentially the area east of the Squamscott River and Great Bay.) | 3.3 | 3 | 3 |
| 2.1.6 | Develop programs to encourage water conservation | 4.2 | 5 | 5 |
| 2.1.7 | Encourage rainwater harvesting for water supply and stormwater mitigation | 3.6 | 3 | 3 |
| 2.1.8 | Encourage guidelines for minimizing outdoor water use (irrigation) | 3.4 | 3 | 3 |
| 2.1.9 | Encourage infiltration of wastewater and stormwater for groundwater recharge | 4.6 | 5 | 5 |
| 2.1.10 | Establish a watershed approach to water resource management planning per RSA 4C | 4.0 | 4 | 5 |
| 2.1.11 | Establish an integrated mapping program that merges groundwater and surface water and vegetation and slope | 3.2 | 3 | 2 |
| 2.1.12 | Establish baseline data on groundwater levels, stream flow, and river geomorphology within the Piscataqua Region Estuary watershed | 4.0 | 4 | 5 |
| 2.1.13 | Establish quantity standards for groundwater withdrawals | 4.2 | 4 | 5 |
| 2.1.14 | Establish tiered fee system for water withdrawals and a hierarchy of uses | 3.8 | 4 | 4 |
| 2.1.15 | Integrate regulations of surface water and groundwater for water quantity | 3.2 | 3 | 3 |
| 2.1.16 | Install additional monitoring wells in watersheds to characterize groundwater | 3.4 | 3.5 | 4 |
| 2.1.17 | Inventory major water withdrawals | 3.8 | 4 | 5 |
| 2.1.18 | Research the effects of stream flow on biology | | | |

## Appendix C-1. Water Resources Actions (continued)

| *Action #* | *Action* | *Mean* | *Median* | *Mode* |
|---|---|---|---|---|
| 2.2.1 | Acquire LIDAR data for the PREP focus area | 3.8 | 5 | 5 |
| 2.2.2 | Establish a flood mapping program using LIDAR technology | 3.4 | 3 | 5 |
| 2.2.3 | Encourage communities to develop floodplain maps for streams that are not currently mapped | 3.3 | 3 | 5 |
| 2.2.4 | Update the rainfall model for flood forecasting and stormwater design in the Piscataqua Region watershed to reflect current rainfall estimates | 3.9 | 4 | 4 |
| 2.2.5 | Encourage & assist coastal watershed communities to implement Flood Commission Report & Stormwater Commission Report | 3.8 | 4 | 4 |
| 2.2.6 | Establish a flood mapping program using LIDAR technology to create more accurate flood forecasts | 3.6 | 4 | 5 |
| 2.2.7 | Inventory locations of flooding areas using GIS | 3.8 | 4 | 4 |
| 2.2.8 | Perform wetlands analysis for functional flood attenuation performance | 2.9 | 3 | 3 |
| 2.2.9 | Maintain or re-establish floodplains to protect habitat, sediment and nutrient attenuation, and flood prevention attributes | 4.4 | 4.5 | 5 |
| 2.2.10 | Obtain high-resolution impervious surface data (1-foot ground resolution or better) on a recurring basis from remotely sensed imagery, as basis for modeling hydrologic impacts of development. | 3.3 | 4 | 4 |
| 2.3.1 | Assess the geomorphic conditions of all coastal rivers to identify fluvial erosion hazards (see EPA method for "watershed assessment of river stability and sediment supply (WARSSS)") | 4.1 | 4.5 | 5 |
| 2.3.2 | Encourage the adoption of Fluvial Erosion Hazard Ordinances by municipalities | 4.2 | 4 | 5 |
| 2.3.3 | Encourage communities to adopt the NHF&G Stream Crossing Guidelines as the communities' standard for stream crossings. If they adopt and implement this standard, FEMA may approve upgrades to failed culverts (disaster declaration needed). | 4.7 | 5 | 5 |
| 2.3.4 | Implement the requirements of the Protected Rivers Management Act (RSA 483) by assisting LACs conduct geomorphic assessments to serve as a basis for watershed/corridor management plans authorized under RSA 483:10 | 4.4 | 5 | 5 |

## Appendix C-2. Living Resources and Habitat Restoration Actions

| *Action #* | *Action* | *Mean* | *Median* | *Mode* |
|---|---|---|---|---|
| 1.1.1 | Establish monitoring and analysis protocols that correlate water characteristics and phytoplankton type/abundance to the growth of clams and shellfish. | 3.0 | 3.0 | 3.0 |
| 1.1.2 | Implement a comprehensive recovery plan for native oyster populations in Great Bay. | 5.0 | 5.0 | 5.0 |
| 1.2.1 | Develop a clam bed management plan for the Hampton Seabrook Estuary. | 4.3 | 4.0 | 4.0 |
| 1.3.1 | Support and invest in oyster restoration activities as a nitrogen-removal strategy. | 3.3 | 3.0 | 3.0 |
| 1.3.2 | Develop a plan and support control of nitrogen entering estuarine areas. | 4.3 | 5.0 | 5.0 |
| 1.3.3 | Implement a comprehensive recovery strategy for eelgrass throughout the Great Bay Estuary. | 3.8 | 4.0 | 4.0 |
| 1.4.1 | Continue or establish long term stocking programs for anadromous fish where deemed appropriate and effective in helping populations rebuild. | 2.4 | 2.5 | 3.0 |
| 1.4.2 | Require all dams to pass at least 80% of every species of migratory fish. | 3.2 | 4.0 | 4.0 |
| 1.4.3 | Develop state plans for improving fish access to upstream habitat on a river-by-river basis | 3.9 | 4.0 | 4.0 |
| 1.4.4 | Advocate to NHFG and the Atlantic States Marine Fisheries Commission for improved harvest management of river herring. | 2.7 | 2.5 | 2.0 |
| 1.4.5 | Streamline historical/cultural permit requirements for aquatic habitat restoration projects. | 3.6 | 4.0 | 4.0 |
| 1.4.6 | Develop a monitoring/indicator strategy for diadromous fish returns. | 3.7 | 4.0 | 4.0 |
| 1.5.1 | Identify, protect, and restore existing populations of native Eastern brook trout. | 3.7 | 4.0 | 4.0 |
| 1.6.1 | Establish long term population database for shorebirds and saltmarsh breeding species | 3.6 | 3.0 | 3.0 |
| 1.6.2 | Develop and implement a restoration program to restore Saltmarsh sharp-tailed sparrows to five currently unoccupied sites by 2020. | 3.2 | 3.0 | 3.0 |

## Appendix C-2. Living Resources and Habitat Restoration Actions (continued)

| *Action #* | *Action* | *Mean* | *Median* | *Mode* |
|---|---|---|---|---|
| 1.7.1 | Assess status of buffers, prioritize restoration sites and restore chosen reaches | 3.7 | 4.0 | 3.0 |
| 1.7.2 | Promote statewide vegetative buffer regulations and outreach. | 3.5 | 4.0 | 4.0 |
| 1.7.3 | Evaluate first and second order stream buffer regulations and work with towns on implementing consistent regulatory protections throughout the watershed. | 3.5 | 4.0 | 5.0 |
| 1.8.1 | Conduct stream/road crossing inventories in all estuarine tributaries to identify and fix crossings that are fish passage barriers or have significant negative impacts on the physical, chemical, or biological integrity of waterways. | 4.0 | 4.0 | 4.0 |
| 1.8.2 | Assess and improve effectiveness of fish ladders. | 3.6 | 3.0 | 3.0 |
| 1.8.3 | Conduct public outreach campaign on the benefits of dam removal for water quality, habitat, and anadromous fish restoration. | 3.1 | 3.0 | 3.0 |
| 1.8.4 | Consider Brownfield sites as priority sites for restoration activities. | 2.2 | 2.0 | 3.0 |
| 1.8.5 | Support/initiate legislation that requires owners of buried surface waters to restore/daylight buried waterways. | 2.0 | 2.0 | 2.0 |
| 1.8.6 | Advocate for the removal of non-essential dams on coastal streams and rivers, with a priority emphasis on dams located within the natural zone of tidal influence. | 4.4 | 4.0 | 4.0 |
| 1.9.1 | Identify areas of shoreline hardening and coastal infrastructure that create an inability for marshes to migrate and provide options for alternatives. | 3.2 | 3.0 | 4.0 |
| 1.9.2 | Identify undeveloped land adjacent to Piscataqua Region estuaries that can be protected through purchase, easements, or regulation to allow shoreline and marsh migration in response to sea level rise. | 4.1 | 4.0 | 5.0 |

## Appendix C-2. Living Resources and Habitat Restoration Actions (continued)

| *Action #* | *Action* | *Mean* | *Median* | *Mode* |
|---|---|---|---|---|
| 1.9.3 | Work with partners to acquire high-resolution LIDAR datasets for the entire coastal block for accurate inundation modeling. | 4.2 | 4.0 | 4.0 |
| 1.9.4 | Promote state/regional adoption of updated culvert and bridge sizing standards that account for predicted increases in the frequency and magnitude of large storm events. | 3.7 | 4.0 | 3.0 |
| 1.10.1 | Identify and implement salt marsh restoration and enhancement projects. | 4.5 | 5.0 | 5.0 |
| 1.11.1 | Create mechanism/program for management of invasive species in new storm water detention ponds. | 2.3 | 2.0 | 2.0 |
| 1.11.2 | Support the Coastal Watershed Invasive Plant Partnership's efforts to control terrestrial and wetland invasive plants. | 4.6 | 5.0 | 5.0 |
| 1.11.4 | Support NHDES Exotic Species Program's efforts to control freshwater aquatic nuisance species. | 3.0 | 3.0 | 3.0 |
| 1.11.5 | Support the development and implementation of marine aquatic nuisance species management plans for Piscataqua Region estuaries. | 3.8 | 4.0 | 4.0 |
| 1.12.1 | Develop comprehensive outreach program for communities on siting new energy infrastructure projects. | 2.0 | 2.0 | 1.0 |
| 1.12.2 | Review possible new energy projects and determine those that have least impact to estuarine environments. | 2.7 | 3.0 | 3.0 |
| 1.13.1 | Work with private retailers and marinas to offer incentives for "conservation moorings" that greatly reduce mooring impacts to eelgrass beds | 3.7 | 4.0 | 4.0 |
| 1.13.2 | Review permit proposals for new or expanded estuarine dredging operations and comment on adequacy of proposed mitigation strategies. | 3.2 | 4.0 | 4.0 |
| 1.13.3 | Incorporate environmental standards with the rules that govern new tidal moorings. | 3.8 | 4.0 | 4.0 |
| 1.14.1 | Review existing shoreland hardening regulations and revise to incorporate environmental concerns. | 3.9 | 4.0 | 4.0 |

## Appendix C-2. Living Resources and Habitat Restoration Actions (continued)

| *Action #* | *Action* | *Mean* | *Median* | *Mode* |
|---|---|---|---|---|
| 1.15.1 | Inventory and map populations of key species and habitat for restoration. | 3.9 | 4.0 | 4.0 |
| 1.15.2 | Support science-based decision-making in determining appropriate strategies to control disease-carrying mosquitoes while avoiding negative impacts on wildlife and habitat. | 3.4 | 3.0 | 3.0 |
| 1.15.3 | Work with DES Wetlands Program to increase mitigation ratios and/or in lieu mitigation fees required when permitting impacts to smaller, higher quality wetlands ( i.e. vernal pools) or wetland that are very difficult to replace (forested wetlands, bogs, etc..) | 3.7 | 4.0 | 4.0 |
| 1.15.4 | Implement restoration/protection of rare or exemplary habitats and habitats for rare, threatened or endangered species as recognized by the State of NH. | 4.2 | 4.0 | 5.0 |
| 1.15.5 | Initiate and support management of grasslands and open fields to protect grassland species. | 3.7 | 4.0 | 4.0 |
| 1.16.1 | Restore winter flounder population through stocking and research. | 2.8 | 2.5 | 2.0 |

## Appendix C-3. Land Use and Habitat Protection Actions

| *Action #* | *Action* | *Mean* | *Median* | *Mode* |
|---|---|---|---|---|
| LU 1.1.1 | Promote site development strategies that protect key natural areas from adverse impacts | 4.5 | 5 | 5 |
| LU 1.1.2 | Promote residential and commercial density to maximize protection of open space and ecologically valuable lands. | 4.0 | 4 | 5 |
| LU 1.1.3 | Develop an interactive website to coordinate outreach and updates to stakeholders regarding land use practices that protect natural resources | 3.1 | 3 | 3 |
| LU 1.1.4 | Work with the development community to adopt smart growth and green development standards. | 3.8 | 4 | 4 |
| LU 1.1.5 | Support NROC and NEMO land use planning outreach program and encourage continued improvement of this program. | 4.4 | 5 | 5 |
| LU 1.2.1 | Minimize impervious cover in new development | 4.6 | 5 | 5 |
| LU 1.2.2 | Promote regulations that minimize off-site impacts from development activity | 4.6 | 5 | 5 |
| LU 1.2.3 | Update land use regulations to reflect LID techniques and principles | 4.4 | 4 | 4 |
| LU 1.2.4 | Encourage communities to develop water conservation plans that include LID techniques e.g. rain barrels etc. | 3.2 | 3 | 3 |
| LU 1.2.5 | Develop an LID Road Show and travel to PREP communities to provide training and information on these strategies. | 3.8 | 4 | 4 |
| LU 1.2.6 | Provide guidance to municipalities and work with NHDES and Maine DEP to implement stormwater management guidance and regulations | 3.7 | 4 | 4 |
| LU 1.2.7 | Provide support to municipalities to implement stormwater programs and regulations | 4.0 | 4 | 4 |
| LU 1.2.8 | Support programs to minimize impacts of impervious surface cover and inadequate stormwater treatment. | 3.8 | 4 | 4 |
| LU 1.2.9 | Establish a focused program to maintain effective impervious cover below 5% in small and less developed watersheds | 4.4 | 4 | 5 |

## Appendix C-3. Land Use and Habitat Protection Actions (continued)

| *Action #* | *Action* | *Mean* | *Median* | *Mode* |
|---|---|---|---|---|
| LU 1.3.1 | Improve enforcement of state and local land use regulations that protect natural resources | 4.5 | 5 | 5 |
| LU 1.3.2 | Explore and support regional mechanism to implement land use practices and patterns that minimize environmental impacts and nutrient loads | 4.2 | 4 | 5 |
| LU 2.1.1 | Identify and protect highest value wetlands within Piscataqua Region watersheds | 4.7 | 5 | 5 |
| LU 2.1.2 | Implement model ordinances from Innovative Land Use Planning in all PREP communities. | 4.3 | 4.5 | 5 |
| LU 2.1.3 | Track and enforce no net wetland loss on a regional basis -- require mitigation | 3.7 | 4 | 3 |
| LU 2.1.4 | Work with Maine and NH to improve wetlands mitigation policy | 4.1 | 4 | 4 |
| LU 2.1.5 | Control or eliminate wetland draining | 4.1 | 4 | 5 |
| LU 2.2.1 | Provide scientific information on the function and values of buffers to determine buffer uses and no disturbance areas. | 4.0 | 4 | 4 |
| LU 2.2.2 | Implement and enforce provisions of the NH Comprehensive Shoreland Protection Act and the Maine Mandatory Shoreland Zoning Act. | 4.4 | 5 | 5 |
| LU 2.2.3 | Address grandfathered land use regulations with financial incentives for relocation away from coastlines or out of floodplains | 3.3 | 3 | 3 |
| LU 2.2.4 | Identify vulnerable areas where there should not have been development and then prohibit any further building there | 4.2 | 4 | 5 |
| LU 2.2.5 | Promote and implement model ordinances for development in fluvial erosion hazard zones, floodplains and shorelands. | 4.1 | 5 | 5 |
| LU 2.2.6 | Implement adaptive planning to accommodate climate change induced changes to hydrology | 4.1 | 4 | 4 |
| LU 2.2.7 | Promote land protection strategies for critical areas (wetlands, floodplains, shorelands) | 4.4 | 5 | 5 |
| LU 2.3.1 | Develop education for landowner, planning boards and conservation commissions regarding 1st order streams and why they are important to protect | 4.4 | 5 | 5 |
| LU 2.3.2 | Improve specifications for bridge and culvert design for aquatic activity, hydrologic connectivity | 4.4 | 5 | 5 |
| LU 2.3.3 | Develop municipal ordinances to protect buffers for first, second and third order streams | 4.7 | 5 | 5 |

## Appendix C-3. Land Use and Habitat Protection Actions (continued)

| *Action #* | *Action Description* | *Mean* | *Median* | *Mode* |
|---|---|---|---|---|
| LU 3.1.1 | Work with The Nature Conservancy, NPR, etc. with land trust groups for fundraising efforts for land purchase | 4.4 | 5 | 5 |
| LU 3.1.2 | Add a linkage plan to the Coastal Conservation Plan (CCP) | 4.6 | 5 | 5 |
| LU 3.1.3 | Refine the CCP to the local level that includes local priorities | 3.9 | 4 | 3 |
| LU 3.1.4 | Promote and support forest land acquisition for carbon absorption | 3.9 | 4 | 4 |
| LU 3.2.1 | Provide or locate funding for conducting local wildlife, natural community surveys | 4.1 | 4 | 5 |
| LU 3.2.2 | Develop local interest in surveying, evaluating habitat of rare and endangered species | 3.6 | 3 | 3 |
| LU 3.2.3 | Permanently protect North-South and East-West migration corridors | 4.4 | 5 | 5 |
| LU 3.3.1 | Protect groundwater and drinking water supplies in perpetuity by prohibiting commercial exploitation of water resources (bottling, etc..) . | 3.6 | 4 | 5 |
| LU 3.3.2 | For drinking water supplies that cross town boundaries, adopt regional standards - I.E.: erosion control, setbacks, Land use standards to protect drinking water | 4.5 | 5 | 5 |
| LU 3.3.3 | Promote, expand and develop a dedicated funding source for Drinking Water Land Protection Programs. | 4.2 | 4 | 4 |
| LU 3.4.1 | Support implementation of the action from the NH Climate Action Plan to Protect Agricultural Land | 3.8 | 4 | 4 |
| LU 3.4.2 | Market farmland benefits and connections at the local and regional level. | 3.6 | 4 | 4 |
| LU 3.5.1 | Support and provide technical assistance for local and regional land protection organizations and conservation commissions | 4.8 | 5 | 5 |
| LU 3.5.2 | Create mechanism for and provide conservation easement education to subsequent owners of conservation easements | 3.2 | 3 | 3 |
| LU 3.5.3 | Fund and promote ongoing landscape scale ecosystem based stewardship management planning and implementation | 4.7 | 5 | 5 |
| LU 4.1.1 | Research impacts of climate change on estuarine lands and resources | 4.2 | 5 | 5 |
| LU 4.1.2 | Identify invasive species versus adaptive species coming into the area | 3.4 | 3 | 3 |
| LU 4.1.3 | Work with FEMA to obtain updated regional flood maps | 3.7 | 4 | 4 |

## Appendix C-4. Watershed Stewardship Theme Actions [(1)]

| *Action #* | *Action Description* |
|---|---|
| 1.1.1 | Complete an economic impact study assessing the dollar value of functions and services of specific estuary resource areas. |
| 1.1.2 | Develop and implement a strategic communication plan that will result in the utilization of the economic valuation data by coastal decision makers. |
| 1.2.1 | Produce an Environmental Indicators Report, State of the Estuaries Report, and State of the Estuaries conference. |
| 1.2.2 | Support outreach and education programs on natural resource planning issues to Conservation Commission, Planning Board, Zoning Board of Adjustments, and municipal staff. |
| 1.2.3 | Develop UNH GRANIT tools to aid municipal planning officials in identifying the impacts of development proposals on various natural resources. |
| 1.2.4 | Support coordinated communication to coastal watershed stakeholders about activities that implement the PREP Management Plan |
| 1.2.5 | Update curricula in existing environmental education programs to include current estuaries issues. |
| 1.3.1 | Support municipal implementation of Phase II stormwater requirements for MS4 communities and BMP outreach and education to municipal staff for communities that are not required to comply with Phase II regulations. |
| 1.3.2 | Assist NHFG with outreach for Operation Game Thief |
| 1.3.3 | Support efforts to increase capacity of regulatory agencies that implement the PREP Management Plan. |

(1) Watershed Stewardship actions were not ranked in the stakeholder input and meeting process

**Appendix D. Statistics Used in Ranking Actions by Theme Areas**

| *Statistic* | *Water Resources* | *Living Resources & Habitat Restoration* | *Land Use & Habitat Protection* |
|---|---|---|---|
| Mean ranking | 3.8 | 3.5 | 4.1 |
| Standard deviation | 0.52 | 0.65 | 0.44 |
| Number of actions | 91 | 45 | 49 |
| Maximum mean ranking | 4.7 | 5.0 | 4.8 |
| Minimum mean ranking | 2.3 | 2.0 | 3.1 |