TABLE OF CONTENTS

Abstract

Maine's 2015 conservation actions consist of complimentary coarse- and fine-filter approaches that maximize limited conservation resources. The Maine Dept. of Inland Fisheries and Wildlife (MDIFW), the Maine Dept. of Marine Resources (MDMR), the Maine Coastal Program (MCP), the Maine Natural Areas Program (MNAP), and other conservation partners worked closely to develop thorough lists of coarse- and fine-filter conservation actions. They attempted to balance action specificity with flexibility so that actions can be adapted as needed to emerging issues and information. Conservation actions are non-regulatory, but rather are undertaken voluntarily by agencies and conservation partners. Actions are not intended to replace current management strategies but can be used to bolster existing or inspire new efforts.

The actions identified reflect several stages of prioritization. MDIFW, MDMR, and partners identified conservation actions for 395 Species of Greatest Conservation Need (SGCN). Of these, 212 were applied to individual SGCN, 166 were applied to guilds, and 17 were applied to one or more taxonomic groups. Nine of these actions were assigned to all SGCN species. MDIFW, MDMR, MCP, MNAP, and partners also identified 362 habitat conservation actions, including 173 marine and coastal habitat actions, 69 freshwater aquatic habitat actions, and 120 terrestrial and freshwater wetland habitat actions. Given the volume of habitat conservation actions identified, workgroups developed several themes to organize actions into discrete packages of related actions that address common stressors or use similar techniques. Actions within a theme are often complimentary, and may be the most effective and efficient use of conservation resources. Three 'super-themes' emerged across habitat groups: Connectivity, Invasive Species, and Mapping and Outreach. Actions included in these themes will benefit from coordinated efforts across habitats. Each conservation action is linked to its target SGCN or habitat and the stressor(s) the actions is addressing in a relational database, an idea proposed in the 2005 CWCS and successfully developed as part of the 2015 Action Plan. MDIFW, MDMR, and partners also identified 11 Programmatic Actions to help guide implementation and tracking of the 2015 Wildlife Action Plan -- Outreach and Engagement, Funding and Tracking, Action Development, and Regional Partnerships. A proposed suite of considerations for MDIFW, MDMR, and partners to use when selecting conservation actions for implementation are presented. Differences from Maine's 2005 Comprehensive Wildlife Conservation Strategy are discussed.

ELEMENT 4: CONSERVATION ACTIONS

6.1 INTRODUCTION

In the previous chapter, we identified the primary issues affecting Maine's Species of Greatest Conservation Need (SGCN) and their habitats. In this chapter, we discuss strategies ('conservation actions') to address the negative effects of stressors on SGCN and habitats. **Conservation actions are non-regulatory approaches undertaken voluntarily by agencies and other partners. These actions are not intended to replace current management strategies but can be used to bolster existing or inspire new efforts.** In this chapter, we describe our approach to developing conservation actions at the SGCN, habitat, and programmatic scales and introduce a strategy for prioritizing conservation projects over the next ten years.

Maine's 2015 conservation actions consist of complimentary coarse- and fine-filter approaches that maximize limited conservation resources. Coarse-filter conservation actions are those applied broadly at large spatial scales (e.g., habitats) or groupings (e.g., communities) and benefit most species associated with that habitat or group. Coarse-filter approaches focus largely on conserving plant and animal communities and the interactions among them. For example, replacing an undersized stream culvert with a larger structure that restores natural stream processes (e.g., flow and sediment transport) benefits multiple aquatic and riparian organisms. However, certain SGCN require additional targeted efforts ('fine-filter' actions) to alleviate stressors not adequately addressed through coarse filter conservation approaches. For example, wildlife diseases (e.g., white nose syndrome in bats) often require targeted species-specific control, treatment, and transmission prevention programs.

The Maine Dept. of Inland Fisheries and Wildlife (MDIFW), the Maine Dept. of Marine Resources (DMR), the Maine Coastal Program (MCP), the Maine Natural Areas Program (MNAP), and other conservation partners worked closely to develop thorough lists of coarse- and fine-filter conservation actions. We attempted to balance action specificity with flexibility so that actions can be adapted as needed to emerging issues and information. The actions presented below set the course for Maine's next ten years of wildlife conservation. These lists are extensive and comprehensive, and thus require a truly statewide collaborative effort among all partners, from agency wildlife stewards to private landowners. Each of us can have a positive effect on Maine's SGCN, and we believe the conservation actions below present a diverse menu of conservation strategies suitable for private citizens up to large regional inter-agency

partnerships. We hope these lists will help partners identify new collaborative opportunities and that they will see a role for themselves in the 2015 Action Plan.

6.1.1 Differences from Maine's 2005 Comprehensive Wildlife Conservation Strategy

Maine's 2005 Comprehensive Wildlife Conservation Strategy (CWCS) (MDIFW 2005) also incorporated coarse and fine filter conservation approaches. For SGCN, actions were divided into five super-strategies (surveys/monitoring, research, population management, habitat conservation, and education and outreach) and relied heavily on the comprehensive species planning process to identify both species-specific and habitat scale conservation priorities.

One major coarse-filter conservation approach outlined in the 2005 CWCS is the *Beginning with Habitat* (BwH) program. BwH is a habitat-based model that provides wildlife and habitat information to towns working to balance wildlife habitat needs with economic growth and development. BwH seeks to achieve habitat conservation for SGCN by working cooperatively with willing public and private landowners; it is not a regulatory or land-use zoning mechanism. The success of BwH depends largely on voluntary land conservation efforts by landowners, particularly private landowners. BwH remains an effective tool for coarse-filter conservation, and the program will continue to provide SGCN habitat information to towns and support meaningful habitat conservation and management incentive programs for private landowners. In the 2015 Action Plan, however, BwH is just one of many collaborative habitat conservation tools identified by partners.

Below are additional major differences in the identification, development, and implementation of conservation actions in the 2015 Action Plan. Specifically, we:

- Identified and developed actions (especially for habitats) collaboratively among agencies and other conservation partners; all conservation partners also were given an opportunity to review and provide input on conservation actions before posting the Action Plan for the 30-day public comment period.

- Developed habitat actions that directly address habitat stresses and not just stresses to SGCN.

- Developed habitat action themes to help organize habitat actions into discrete packages that address a common set of stressors or use similar approaches to do so.

- Added an action type (e.g., new or on-going) to help distinguish between existing programs and those that need to be initiated.

- Developed programmatic actions to guide Action Plan implementation, reporting, and partner involvement.

- Prioritized actions based on biological priority to SGCN and habitats.

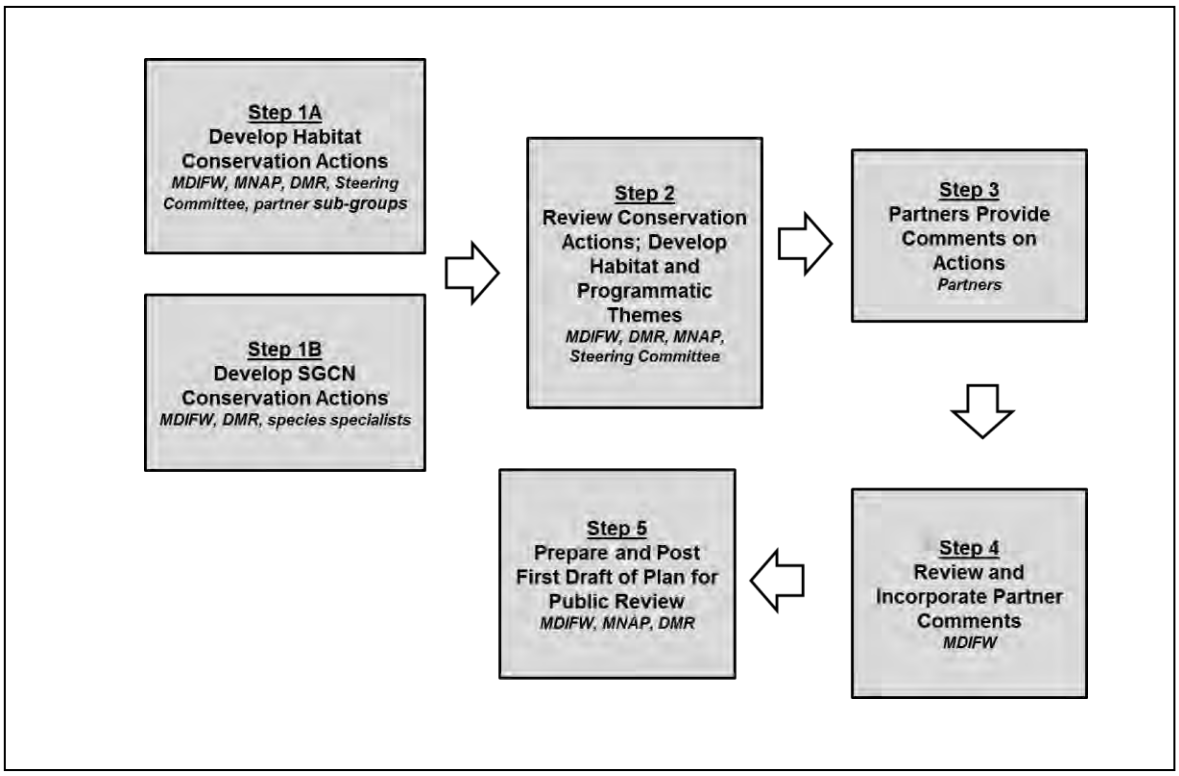
- Developed a prioritization approach to evaluate SWG-funded project proposals.

- Linked conservation actions to SGCN, habitats, and stressors in a relational database.

6.1.2 General Considerations for Development of Conservation Actions

MDIFW collaborated closely with partners, species specialists, and habitat experts over a five-month period (February-July 2015) to develop SGCN and habitat conservation actions. While slightly different but parallel approaches were used to develop SGCN and habitat actions (Figure 6-1), conservation actions at both scales address specific stressor(s) to SGCN and habitats. Conservation action descriptions were written broadly enough to allow for adaptive management over the next ten years but with enough specificity to help assess performance (AFWA 2012). We also developed 11 programmatic actions that will guide implementation of the Action Plan over the next ten years.

Figure 6-1: Overall process for developing SGCN, habitat, and programmatic conservation actions. Agencies and partners involved at each stage are noted in italics.



We identified comprehensive lists of 395 SGCN and 362 habitat conservation actions. These lists reflect several stages of prioritization and condensing. First, we developed SGCN-specific actions only for Priority 1 and Priority 2 species, and addressed Priority 3 species at the guild level. Second, we only developed conservation actions for priority habitat and SGCN stressors, defined as stressors that were at least moderately actionable and moderately severe (Figure 5-1). Finally, we further prioritized our comprehensive list of actions based on biological priority (see below for further explanation).

We used the following categories to help organize and prioritize SGCN and habitat conservation actions:

1. **Action Category:** MDIFW assigned conservation actions to one of six broad categories to help organize related actions. While some actions fit into multiple categories, we assigned the best fitting category for each action.

    a. **Habitat management:** Addresses stressors to SGCN habitats through habitat conservation, management, or stewardship.

    b. **Policy:** Addresses existing policies or the need for new policies that encourage conservation of SGCN and habitats; all actions in this category are strictly non-regulatory.

    c. **Public outreach:** Addresses the need to raise the public's awareness of the stressors to SGCN and their habitats.

    d. **Research** – Addresses gaps in our understanding of life history, productivity, mortality, habitat requirements, limiting factors, interactions with other species, and conservation needs of SGCN.

    e. **Species Management:** Addresses management needs at the species or population level.

    f. **Surveys and Monitoring** – Addresses data gaps and informational needs on the distribution, abundance, and status of SGCN;

2. **Biological Priority:** Actions were assigned a biological priority level based on how essential that action is toward conserving a species or habitat over the next ten years. Biological priority does not take into account the economic or practical feasibility of actions. Because actions were developed only for priority stressors, there is no 'low' level of biological priority.

    a. **Critical**: Actions that are necessary for sustaining species or habitats in order to prevent the loss of populations or significant portions of habitats or habitat integrity in the next ten years.

    b. **High**: Actions that are important for conserving habitats or preventing the loss of SGCN populations but would not result in dire losses if not enacted over the next ten years.

    c. **Moderate:** Actions that would benefit habitats or SGCN but alone may not be crucial for their continued existence over the next ten years.

3. **Action Type:** This category indicates whether an action is already underway ('**on-going**') or if a new effort is needed ('**new**'). We included on-going actions in the 2015 Plan to acknowledge and provide continued support for continuing conservation efforts. For example, one habitat action calls for continued support of programs that add woody material to streams and lakes. Including this action in the plan allows partners to leverage additional resources for promoting and expanding existing effective programs (e.g., Chop and Drop) as appropriate.

Each conservation action is linked to its target SGCN or habitat, the stressor(s) the actions is addressing, and the above categories in a relational database, an idea proposed in the 2005

CWCS and successfully developed as part of the 2015 Action Plan. This database allows users to quickly search by habitat, SGCN, or stressor and group actions by categories or programs of interest. Eventually, MDIFW hopes to add additional information to habitat and SGCN conservation actions in the database, such as contact information for partners or agencies coordinating projects and information on project progress. Programmatic actions may eventually be added to the database but are currently housed in this chapter.

6.2 SGCN CONSERVATION ACTIONS

6.2.1 SGCN Action Background

Conservation Actions for Maine's SGCN represent the Action Plan's fine-filter approach to species conservation. Although we anticipate that coarse-filter, habitat based actions will ultimately address most of the important problems facing SGCN, there are some species that require individual attention. In some cases, stressors impacting SGCN are not directly related to that species' habitat (e.g. white-nosed syndrome in bats), or individual SGCN have specific habitat requirements that can't be reasonably be addressed by generic conservation actions for habitats. Additionally, some SGCN have pre-existing conservation plans (e.g. Atlantic salmon) where actions to monitor and conserve the species have already been determined. In these cases, actions were adopted from these established plans. In assigning conservation actions to SGCN, we hope to ensure that no SGCN 'falls through the cracks' over the next 10 years. At the same time, we attempted to limit the application of species-specific conservation actions to those SGCN have pressing conservation needs.

6.2.2 Development of SGCN Conservation Actions

Conservation actions were developed as follows:

1. Species specialists within MDIFW and DMR developed 23 species 'guilds' in order to streamline the assignment of conservation actions. These guilds consisted of groups of species facing similar conservation problems, and for which conservation actions could be developed concurrently. Guilds included Priority 1, Priority 2, and Priority 3 SGCN.

2. Using expert knowledge, species specialists assigned conservation actions to address stressors of medium-high or high priority (see Element 3) that had been assigned to Priority 1 or Priority 2 SGCN. Conservation actions that were assigned to guilds were applied to all species within the guild, regardless of the species priority level. For each conservation action, specialists assigned a rank for biological priority, conservation type, and conservation category using the criteria described in this chapter's introduction.

3. Once initial assignments were complete, a small group of MDIFW and DMR staff reviewed the draft list of conservation actions, and identified several similar actions that had been applied to many species within a single taxonomic group, and in some cases, to multiple species across taxonomic groups. These actions were refined, and applied either to all SGCN species, or to all SGCN within a taxonomic group, as appropriate.

4. The full list of SGCN conservation actions was reviewed and edited by a small group of staff to improve editorial consistency and ensure accuracy.

5. The draft list of SGCN conservation actions was presented to conservation partners at a meeting on June 16, 2015 and distributed by email for review and feedback.

6.2.3 Summary of SGCN Conservation Actions

A total of 395 conservation actions were identified for SGCN (see Tables 6-1 to 6-11 at the end of this chapter). Of these, 212 were applied to individual SGCN, 166 were applied to guilds of species, and 17 were applied to one or more taxonomic groups. Nine of these actions were assigned to all SGCN species. In total there were 109 actions applied to birds, 85 to reptiles, amphibians or invertebrates, 29 to inland fish, 20 to mammals, and 191 to marine species (Table 6-12). Most actions were classified as research or survey and monitoring, reflecting the pervasive need to gather more information on SGCN in order to facilitate their conservation. Nearly half of the SGCN conservation actions are already ongoing in some form (although they may require enhancement), and approximately 20% were viewed as critical to habitat conservation over the next ten years (Tables 6-13 and 6-14).

Table 6-12: SGCN conservation actions by Action Category

Taxonomic Group	Habitat Management	Policy	Public Outreach	Research	Species Management	Survey and Monitoring	Total
Birds	16	11	11	30	18	23	109
Reptiles, Amphibians, and Invertebrates	15	12	6	22	15	15	85
Inland Fish	7	7	2	9	3	1	29
Mammals	2	9	4	2	1	2	20
Marine	18	31	27	67	8	40	191
Total	55	42	42	130	45	81	395

Table 6-13: SGCN conservation actions by Type

Taxonomic Group	New	Ongoing	Total
Birds	68	41	109
Reptiles, Amphibians, and Invertebrates	53	32	85
Inland Fish	12	17	29
Mammals	10	10	20
Marine	104	87	191
Total	223	172	395

Table 6-14: SGCN conservation actions by Biological Priority

Taxonomic Group	Critical	High	Moderate	Total
Birds	18	76	15	109
Reptiles, Amphibians, and Invertebrates	21	51	12	85
Inland Fish	8	21	0	29
Mammals	1	16	3	20
Marine	34	137	21	191
Total	82	264	51	395

6.3 HABITAT CONSERVATION ACTIONS

6.3.1 Habitat Action Background

Maine's 2015 Action Plan takes a holistic approach to SGCN conservation by focusing on both species and habitats. Habitat-scale conservation uses a coarse-filter approach whereby strategies applied to habitats likely benefit many of the species that occur there. Because habitat-scale actions simultaneously benefit multiple species, they often are an efficient way to stretch limited conservation dollars and often compliment species-specific approaches. While Maine's 2015 Action Plan identifies close to 400 SGCN actions, many of the most common stressors to Maine's 2015 SGCN are associated with habitats (see Element 3).

Maine's landscape is diverse, from subtidal gravel beds to alpine tundra, and the issues facing these habits are equally complex, from localized land-use conversion to regional impacts of climate change. In order to systematically address these complexities, MDIFW, the Steering Committee, and conservation partner representatives worked in small groups (10-15 people) to draft habitat-scale conservation actions based on The Open Standards for the Practice of Conservation (hereafter referred to as 'Open Standards') (Conservation Measures Partnership [CMP] 2013). While widespread conservation partner involvement was crucial at all stages of Action Plan development, the Steering Committee and MDIFW chose this small workgroup approach out of respect for partners' limited time. We felt the most efficient approach was to first create draft actions that the full partner group could then react to.

6.3.2 Development of Habitat Conservation Actions

Conservation actions were developed as follows:

1. MDIFW, the Steering Committee, and several conservation partners attended an Open Standards introductory training led by a local CMP Conservation Coach in mid-February 2015.

2. MDIFW, MNAP, MCP, DMR, and members of the Steering Committee assigned all habitat macrogroups to one of 19 'habitat groupings' (Table 6-15), based on similar ecology, spatial distribution, and/or stressors. Certain macrogroups (e.g., vernal pools, northeastern floodplain forests, central oak pine barrens) did not fit cleanly into habitat groupings due to their ecological uniqueness or nuances of stressors facing them; these macrogroups were pulled out separately into their own habitat grouping. Habitat groupings were then assigned to one of three workgroups for discussion: 1) marine/coastal habitats; 2) freshwater aquatic habitats; or, 3) terrestrial/wetland habitats.

3. In late February, MDIFW, MNAP, MCP, DMR, the Steering Committee, and partners nominated by the Steering Committee participated in two full-day Open Standards work sessions to begin developing conservation actions for each habitat grouping. Each work session was led by a CMP Conservation Coach that also was a member of the Steering Committee or a conservation partner. As a group, we created a conceptual model for each habitat grouping to link key stressors to actions using the following approach:

a. **Conservation Targets:** For each habitat grouping, the workgroup identified conservation targets, such as maintaining the current distribution of the habitat or its ecological integrity.

b. **Key Stressors:** We then identified the key stressors to the habitat grouping. We began this discussion by first looking at stressors assigned to habitat macrogroups that were at least moderately actionable and moderately severe. If the workgroup felt this list of stressors sufficiently captured the major challenges facing the habitat grouping as a whole, we moved onto the next step. If not, we used best professional judgement to decide whether additional stressors should be addressed by conservation actions.

   We recognize that certain activities labeled 'stressors' to certain habitats or SGCN can also have positive effects or no effect at all. For example, aquaculture activities like shellfish seeding can help improve water quality and help form substrate for important habitat like eelgrass.

c. **Contributing Factors:** For each stressor, the workgroup identified the contributing factors that exacerbated the stressor for a particular habitat grouping. For example, Fire Suppression was identified as a key stressor to central oak pine barrens. We identified the public's perception of fire and lack of understanding of the role of fire in maintaining this habitat as key factors inhibiting the use of fire as a management tool in central oak pine barrens, especially near developed areas.

d. **Conservation Actions:** For each stressor, we developed conservation actions designed to alleviate or mitigate that stressor and its contributing factors. For each conservation action, we strived to create a clear link between the action, stressor, and the action's intended benefit to the habitat grouping. We diagrammed these relationships based on Open Standards models. Figure 6-2 depicts a draft conceptual diagram linking stressors and actions for central oak pine barrens.

e. **Categorization:** For each conservation action, we assigned a rank for Biological Priority, Action Type, and Action Category using the criteria described in section 6.1.2.

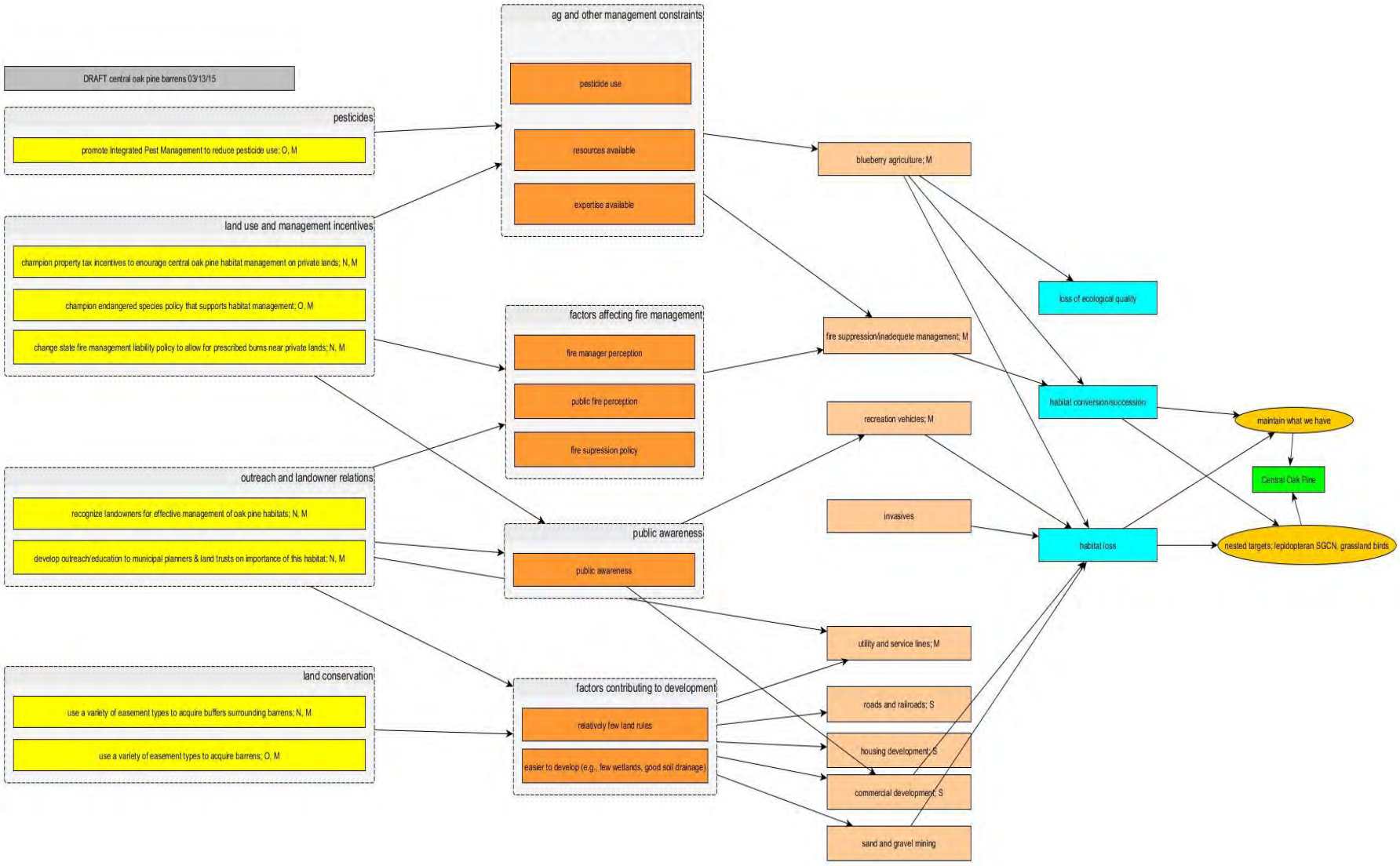
f. **Review:** Each workgroup reviewed and provided feedback on the conceptual diagrams for each habitat grouping in mid-March 2015.

4. The draft list of habitat conservation actions was presented to conservation partners at a meeting on June 16, 2015 and distributed by email for review and feedback.

Table 6-15: Habitat groupings addressed by conservation action workgroups

Workgroup	Habitat Grouping	Habitats (Macrogroups)
Terrestrial/freshwater wetlands	Northern forests and swamps	Boreal forested peatland; boreal upland forest; northern swamp, plantation and ruderal forest, northern hardwood and conifer; northern peatland and fens
	Rocky summits/outcrops/mountaintops	Alpine; cliff and talus; outcrop and summit scrub
	Floodplain forests	Northeastern floodplain forest
	Freshwater marshes	Wet meadow-shrub marsh; emergent marsh; modified-managed marsh; coastal plain pond
	Vernal pools	Vernal pools
	Grassland/shrubland/early successional	Agricultural; maintained grasses and mixed cover; ruderal shrubland and grassland
	Southern/Central forests and swamps	Central hardwood swamp; glade, barren and savanna; northern hardwood and conifer; northern swamp; coastal plain peat swamp
	Pine barrens	Central oak pine
Marine/coastal	Tidal marsh	Intertidal tidal marsh (peat forming)
	Intertidal	Bedrock; gravel shore; mollusc reefs; mudflat; sandy shore; water column
	Subtidal	Bedrock bottom; coarse gravel bottom; mollusc reefs; mud bottom; sand bottom; pelagic (water column)
	Rocky coast	Rocky coast/islands
	Coastal	Coastal grasslands and shrublands
Freshwater aquatics	Headwaters	Ephemeral; headwaters and creeks
	Higher productivity lakes/ponds	Dystrophic lakes and ponds; eutrophic lakes and ponds
	Lower productivity lakes/ponds	Mesotrophic or intermediate lakes and ponds; oligotrophic lakes and ponds, lakeshore beach
	Large rivers	Large rivers
	Small/medium rivers/streams	Medium rivers, small rivers

Figure 6-2. Example Open Standards conceptual model diagram for the central oak pine barren habitat. Objects are as follows: yellow boxes (conservation actions); orange boxes (contributing factors); peach (key stressors) and blue (specific issues caused by stressors) boxes; green box (target habitat) and yellow ovals (specific conservation targets).



6.3.3 Summary of Habitat Conservation Actions

Over 360 habitat actions were identified that address stressors in all habitat groupings, including 173 marine and coastal habitat actions, 69 freshwater aquatic habitat actions, and 120 terrestrial and freshwater wetland habitat actions (Table 6-16 at the end of this chapter). In general, most actions were classified as habitat management, policy, or public outreach (Table 6-17) and more than half are already ongoing (6-18). While all actions included on our list of actions are important, less than 20% were viewed as critical to habitat conservation over the next ten years (Table 6-19).

Table 6-17: Habitat conservation actions by Action Category

Habitat Category	Habitat Management	Policy	Public Outreach	Research	Species Management	Survey and Monitoring	Total
Freshwater	6	24	23	7	2	7	69
Marine / Coastal	51	39	37	33	0	13	173
Terrestrial / Freshwater Wetlands	38	26	27	9	2	18	120
Total	95	89	87	49	4	38	362

Table 6-18: Habitat conservation actions by Type

Habitat Category	New	Ongoing	Total
Freshwater	42	27	69
Marine / Coastal	41	132	173
Terrestrial / Freshwater Wetlands	62	58	120
Total	145	217	362

Table 6-19: Habitat conservation actions by Biological Priority

Habitat Category	Critical	High	Moderate	Total
Freshwater	9	47	13	69
Marine / Coastal	26	77	70	173
Terrestrial / Freshwater Wetlands	32	40	48	120
Total	67	164	131	362

6.3.4 Development of Habitat Themes

Given the volume of habitat conservation actions identified in the 2015 Action Plan, habitat workgroups developed several themes to organize these actions into discrete packages of related actions that address common stressors or use similar techniques (Table 6-20). Actions within a theme are often complimentary, and thus simultaneously undertaking multiple actions within a theme may be the most effective and efficient use of limited conservation resources. Each habitat action was assigned to up to three themes within its respective habitat workgroup (i.e., marine/coastal, terrestrial/freshwater wetlands, or freshwater aquatic habitats) with up to 40 actions per theme.

In order to better illustrate the connection between habitat actions and SGCN, we quantified the minimum number of SGCN likely to benefit from a given theme (Table 6-20). We use the term 'minimum' here because we assume that habitat actions benefit most if not all SGCN associated with a given habitat; however, some species may derive greater benefit than others. We used the approach below to determine the minimum number of SGCN likely to benefit from each theme:

1. We identified all habitat macrogroups associated with a theme.

2. We identified the SGCN (by priority level) associated with each macrogroup. SGCN associated with multiple macrogroups were counted only once.

3. For Priority 1 and 2 SGCN, we identified species with stressors common to those addressed by the habitat theme.

    a. If the common stressor was ranked as moderate or high severity for the SGCN, we assumed the species would likely benefit from a habitat action addressing that stressor. These species were tallied in columns 4 ('P1') and 5 ('P2') of Table 6-20.
        i. For example, 'Housing and Urban Areas' was identified as a severe stressor for Spotted Turtles (Priority 1 SGCN). A theme that includes actions addressing Housing and Urban Areas at the habitat scale would also benefit Spotted Turtles.
    b. If the common stressor was ranked as low severity for the SGCN, we assumed the species may benefit from a habitat theme addressing that stressor, but the

link was not clear. These species were tallied in column 6 ('Total SGCN') of Table 6-20. In many cases, low severity stressors were not even assigned to SGCN because they are unlikely to be priorities in the next ten years.

c. Priority 3 species were not assigned stressors but would likely benefit from habitat actions applied to their habitats. These species were tallied in column 6 ('Total SGCN') of Table 6-20.

While the number of SGCN likely to benefit from themes can help readers assess the relative breadth of themes, these tallies should not be used to evaluate the relative merits of themes. For example, Terrestrial/Wetland Theme 8 (TW8) is broad (minimizing habitat loss and fragmentation by guiding detrimental land-use activities away from the most sensitive and limited SGCN habitats) and encompasses 17 actions, nine habitat groupings, and likely benefits a minimum of 25, 68, and 147 Priority 1, Priority 2, and total SGCN, respectively. In contrast, Terrestrial/Wetland Theme 2 (TW2) has a narrower scope (monitoring and managing impacts of problematic native species) in four terrestrial/wetland habitats. This theme likely benefits at least 160 SGCN associated with these habitats but, using our approach outlined above, does not link directly with any Priority 1 or Priority 2 SGCN. In this case, Problematic Native Species was identified as a moderate stressor in some habitats but was a low severity stressor (or not ranked at all) for SGCN associated with these habitats.

Three 'super-themes' emerged across habitat groups; actions included in these themes will likely benefit from coordinated efforts across habitats. The themes are:

1. **Connectivity:** This super-theme addresses habitat connectivity especially to facilitate the persistence and range expansion of SGCN and their habitats in the face of climate change. While Habitat Shifting and Alteration related to climate change was not a priority stressor for most SGCN, it the second most common stressor assigned to habitat macrogroups. This super-theme also addresses other common causes of habitat fragmentation such as Housing and Urban Areas and Roads and Railroads.

2. **Invasive Species:** Actions in this super-theme consist of monitoring, containment, and control of invasive species. The Invasive Non-native/Alien Species/Diseases stressor was assigned to the largest number of habitat macrogroups and has the potential to affect nearly every habitat in Maine. This stressor also affects many SGCN.

3. **Mapping and Outreach:** Actions in this super-theme address mapping and outreach needs for SGCN and habitats. Lack of Knowledge was identified as a priority stressor for SGCN. For example, many marine SGCN distributions and habitats are largely unknown and therefore unmapped. Many negative effects of stressors can be minimized or avoided by simply knowing where SGCN and habitats are located and conveying this information to local decision makers, landowners, and conservation stewards.

Table 6-20: Habitat conservation action themes (Page 1 of 3)

Code	Theme Description (Total No. Conservation Actions per Theme)	Habitat Groups Directly Addressed by Theme	Min. No. of SGCN Likely to Benefit from a Theme		
			P1[1]	P2[1]	Total SGCN[2]
Marine Themes					
M1 Mapping and Outreach[3]	Map and provide outreach/technical assistance for SGCN occurrence and habitat location information for marine spatial planning and other uses (31)	Intertidal; Subtidal; Tidal marsh; Rocky coast; Coastal	25	62	108
M2	Research, implement, and provide outreach/technical assistance for new and underutilized technologies designed to reduce impacts to SGCN habitats including, but not limited to, litter reduction, ghost gear removal, bycatch reduction, pollution mitigation, climate change and ocean acidification, alternative energies, and aquaculture (30)	Intertidal; Subtidal; Tidal marsh	25	62	104
M3M4	Research the effects of climate change on SGCN and their habitats and incorporate this information and other climate change concepts (e.g., buffering for marsh migration and extreme storms) into coastal development and infrastructure planning, land acquisition, spatial modeling, fishable stock management, habitat restoration, and other efforts to reduce impacts of climate change to SGCN, SGCN habitats, and coastal communities (38)	Intertidal; Subtidal; Tidal marsh; Rocky coast; Coastal	25	62	108
M5 Connectivity	Maintain and improve habitat connectivity while also considering impacts of climate change for SGCN aquatic organisms through mapping, outreach, town/municipal collaboration, and habitat conservation (23)	Intertidal; Subtidal; Tidal marsh; Coastal	18	48	107
M6	Conduct law enforcement training and workshops to support knowledge of SGCN and how existing regulations affect SGCN and their habitats (11)	Intertidal; Subtidal; Tidal marsh; Rocky coast	23	54	105
M7 Invasive Species	Monitor, contain, and control the spread of invasive species that are negatively affecting SGCN habitats through research, management, public outreach, and enforcement of existing policies and regulations (14)	Intertidal; Subtidal; Tidal marsh; Rocky coast	25	62	105
M8	Minimize impacts to SGCN waterbird feeding, roosting and nesting habitats from activities including but not limited to fishing and recreation (13)	Intertidal; Rocky coast; Coastal	14	26	66
M9	Evaluate and implement new and existing methods to monitor and manage commercial and recreational harvest of SGCN to ensure ecological sustainability (including ecosystem or bay scale management) (22)	Intertidal; Subtidal	23	54	93
M10	Minimize loss of marine SGCN habitats due to development (e.g., structures, dwellings, docks, piers, aquaculture facilities, and marinas) and mitigate for associated impacts such as contaminants (e.g., oil, gas, and chemical spills) and disturbance associated with human activity (33)	Intertidal; Subtidal; Tidal marsh; Coastal; Rocky coast	25	62	108
Freshwater Aquatic Themes					
F1 Connectivity	Maintain and improve (where practicable) connectivity for SGCN and their habitats through mapping, outreach, town/municipal collaboration, and policies, while considering impacts of climate change and invasive species (36)	Streams; Rivers; Lakes; Ponds	20	27	72
F2 Invasive Species	Monitor, contain, and control the spread of invasive species that negatively impact SGCN or their habitats through surveys, research, public outreach, habitat management, reclamation, and improved enforcement of existing regulations (9)	Streams; Rivers; Lakes; Ponds	0	0	72

Table 6-20: Habitat conservation action themes (continued; Page 2 of 3)

F3 Mapping and Outreach	Map the distribution of SGCN, their habitats, and their stressors, and provide this information to landowners, land trusts, municipal governments, and conservation partners to aid in spatial planning (9)	Streams; Rivers; Lakes; Ponds	20	27	72
F4	Maintain and restore (where practicable) riparian habitats used by SGCN by providing technical assistance and education to municipalities and natural resource professionals, providing technical assistance and incentives to landowners, and developing BMPs, in order to mitigate climate change and land-use effects (18)	Streams; Rivers; Lakes; Ponds	20	27	72
F5	Reduce pollution and degradation of important SGCN habitats by working with landowners and municipalities to improve wastewater treatment and reduce development near lake and river shores (12)	Streams; Rivers; Lakes; Ponds	20	27	72
F6	Improve passage of fish SGCN at dams by providing outreach and technical assistance to dam owners and operators, researching fish behavior and alternative technologies, conducting a statewide inventory of dams, and reducing the regulatory burden to remove dams (17)	Streams; Rivers; Lakes; Ponds	20	27	72
Terrestrial/Freshwater Wetland Themes					
TW1 Mapping and Outreach	Identify, map, distribute information, and provide technical assistance and outreach to landowners, towns, land trusts, etc. on the location and management of selected high-value, at-risk habitats important to the conservation of SGCN. (28)	Vernal pools; South-central forests and swamps; Grassland, shrubland, early successional; Pine barrens; Freshwater marshes; Floodplain forest	23	64	139
TW2	Identify potential additions or improvements to existing financial and non-financial incentives to encourage landowner participation in the restoration, retention, and management of habitats important to SGCN, analyze these ideas for effectiveness, and seek state and private actions to implement those with the greatest potential for use and benefit (20)	Northern forests and swamps; South-central forests and swamps; Grassland, shrubland, early successional; Pine barrens; Freshwater marshes; Floodplain forest	22	60	147
TW3	Promote expansion of ruderal habitat in southern Maine, which includes determining the amount needed for SGCN conservation, identifying where habitat expansion could most practically occur, and developing habitat management guidelines (21)	Grassland, shrubland, early successional	11	25	57
TW4	Promote expansion of early successional forest habitats in southern Maine and ecologically mature forests in northern Maine needed by SGCN dependent on those habitats, which includes determining the amount needed, and developing habitat management guidelines (20)	Northern forests and swamps; Grassland, shrubland, early successional	19	51	108
TW5 Connectivity	Facilitate the persistence and range expansion of SGCN in Maine in the face of a changing climate by ensuring landscape connectivity (both terrestrial and aquatic) through reducing habitat fragmentation and promoting the conservation of diverse and resilient landscapes and watersheds(28)	Northern forests and swamps; Pine barrens; Freshwater marshes; Rocky summits, outcrops; Vernal pools	22	64	130
TW6 Invasive Species	Monitor, prevent, contain, and control invasive species (plant and animal) and diseases with potential for significant detrimental impact on SGCN and their primary habitats (12)	Vernal pools; Northern forests and swamps; South-central forests and swamps; Freshwater marshes; Floodplain forests; Grasslands, shrublands, early successional	3	3	143

Table 6-20: Habitat conservation action themes (continued; Page 3 of 3)

TW7	Monitor and manage the impact of problematic native species and diseases on SGCN and their habitats (7)	Northern forests and swamps; South-central forests and swamps; Floodplain forest; Grasslands, shrublands, early successional	0	0	130
TW8	Minimize habitat loss and fragmentation by guiding detrimental land-use activities away from the most sensitive and limited SGCN habitats, ensuring land use standards and regulations are appropriately followed, and acquiring conservation lands and buffers surrounding sensitive SGCN habitats (17)	Freshwater marshes; Grasslands, shrublands, early successional; Northern forests and swamps; Pine barrens, South-central forests and swamps; Vernal pools; Floodplain forests	25	68	147
TW9	Promote SGCN habitat management on lands in conservation ownership, especially habitats that are limited and hard to manage economically, such as ruderal habitats, grasslands, pine barrens, floodplains, early and late successional forest habitats (12)	Pine barrens; Rocky summits, outcrops Grasslands, shrublands, early successional; Northern forests and swamps; Freshwater marshes Floodplain forest	11	29	144
TW10	Develop habitat management guidelines for SGCN and promote their incorporation into forest certification systems and outcome-based forestry. (8)	Vernal pools; Northern forests and swamps; Floodplain forest; South-central forests and swamps	14	40	76
TW12	Conduct biological monitoring as required to guide the conservation of SGCN and their habitats especially for habitats requiring active management (e.g., grasslands, shrublands, early successional habitats) or are vulnerable to adjacent activities (e.g., vernal pools) (10)	Grasslands, shrublands, early successional; vernal pools, Northern forests and swamps; South-central forests and swamps; Rocky summits, outcrops	22	60	134

[1]SGCN included in this tally are most likely to benefit from a theme because actions within that theme address habitat stressors that also were identified as 'moderate' or 'severe' stressors at the species scale; SGCN for which a stressor was determined to be of 'slight' severity are not included in this tally.

[2]This is the total number of SGCN that occur in habitats addressed by a theme.

[3]Cell shading indicates a cross-cutting theme common among the three habitat categories; these cross-cutting themes are abbreviated as: 1) Mapping and Outreach, 2) Connectivity, and 3) Invasive Species.

6.4 PROGRMMATIC CONSERVATION ACTIONS

MDIFW and the Steering Committee identified 11 Programmatic Actions to help guide implementation and tracking of the 2015 Wildlife Action Plan Table 6-21). We also identified target start dates for each programmatic action (short-term: within the first few years of Plan implementation; mid-term: within the first half of Plan implementation; long-term: within the second half of Plan implementation) are given for each. Programmatic actions are categorized as follows:

1. **Outreach and Engagement (Programmatic Actions 1-3):** Actions to inform and engage the public and partners on Action Plan accomplishments and opportunities for involvement. These actions are described in Elements 7-8.

2. **Funding and Tracking (Programmatic Actions 4-8):** Actions to bolster funding, capacity, and tracking of SGCN-related projects. Programs 4 and 6 are discussed briefly below. Program 5 is discussed in Elements 7-8 and Programs 7 and 8 are described in Elements 5-6.

    a. **Program 4:** This action supports efforts to establish stable state and federal funding sources for SGCN and habitat conservation. At the federal level, Maine hopes to reinvigorate and expand its dedicated Teaming with Wildlife (TWW) Coalition. The TWW Coalition sponsors annual outreach events in Washington, D.C. to communicate to Congress the importance of SWG and to ask for their support for the program in annual appropriation bills (http://www.teaming.com/state-tribal-wildlife-grants-swg-program). At the state level, MDIFW and partners will continue to investigate stable funding sources for SGCN conservation.

    b. **Program 6:** This action focuses on increasing long-term agency staffing and capacity needs for Action Plan implementation. While many staff in MDIFW work on projects related to SGCN conservation, there are no dedicated Action Plan staff or programs to coordinate Plan administration, tracking, or outreach.

3. **Action Development (Programmatic Action 9):** This action relates to creating SMART (Specific, Measurable, Achievable, Results-oriented, and Time-bound) objectives for high priority SGCN and habitat conservation actions. This action will be discussed in Elements 5-6.

4. **Regional Partnerships (Programmatic Actions 10-11):** These actions address continued MDIFW and partner involvement in existing conservation efforts.

    a. **Program 10:** This action supports efforts to identify new and update existing SGCN Conservation Opportunity Areas (COAs). One such effort is already underway. MDIFW, MNAP, MCP, DMR and other partners are reviewing and revising BwH's Focus Areas of Ecological Significance. BwH Focus Areas are 140 natural areas of statewide ecological significance that contain unusually rich concentrations of at-risk species and habitats

(http://beginningwithhabitat.org/about_bwh/focusareas.html). These areas support rare plants, animals, and natural communities, high quality common natural communities; significant wildlife habitats; and their intersections with large blocks of undeveloped habitat. BwH Focus Area boundaries are drawn based on the species and natural communities that occur within them and the supporting landscape conditions that contribute to the long-term viability of the species, habitats, and community types. MDIFW and partners are revising existing Focus Areas with 2015 SGCN distribution and habitat information and are exploring ways to incorporate resilient landscapes and connectivity among Focus Areas. We expect this revision to be completed within the first few years of Action Plan implementation. We also expect to create a framework that will guide and standardize periodic updates to Focus Areas.

MDIFW and conservation partners also are engaged in several ongoing efforts to adapt broad-scale climate change resiliency information to local and regional scales. For example, MDIFW, MNAP, The Nature Conservancy (TNC), and the 10 partners of Mount Agamenticus to the Sea Conservation Initiative (MTA2C) are assessing the resilience of the MTA2C Focus Area using climate change resilience data and revised SGCN distribution information (http://www.osiny.org/site/DocServer/Catalyst_GranteesToDate_All.pdf?docID=14401). Results of this project will be used to inform local landscape planning and serve as a model for other communities wishing to incorporate climate change information into their planning efforts. A similar effort also is underway in several Downeast Maine communities.

b. **Program 11:** The action supports MDIFW and partner participation in the Northeast Regional Conservation Needs (RCN) Grant Program. The RCN Grant Program addresses critical landscape-scale wildlife conservation needs by combining multi-state resources, leveraging funds, and regionally prioritizing conservation actions identified in State Wildlife Action Plans (http://rcngrants.org/content/northeast-regional-conservation-needs-grant-program). RCN grants funded several products (e.g., the Northeast Terrestrial Habitat Classification System [Anderson et al. 2013]) used in Maine's 2015 Action Plan. MDIFW will work with the Implementation Committee to evaluate, at least annually, continued participation in and endorsement of the RCN program.

Table 6-21: 2015 Maine Wildlife Action Plan Programmatic Actions

Program Type	Program Code	Program Description	Target Start Timeframe		
			Short Term	Mid Term	Long Term
Outreach and Engagement	Program 1	Establish an Action Plan Implementation Committee comprised of conservation partners and agency staff to help guide implementation of the 2015 Action Plan	X		
	Program 2	Devise and implement outreach strategies, including periodic meetings, to inform and engage conservation partners and the general public on 2015 Action Plan information, accomplishments, and opportunities for involvement		X	
	Program 3	Develop a public survey of SWAP and non-game species awareness, concerns, and priorities	X		X
Funding and Tracking	Program 4	Secure stable and additional sources of federal and state funding for SGCN and habitat conservation		X	
	Program 5	Consider establishing a competitive small grants program to make a portion of SWG funds available to partners implementing priority actions identified in the 2015 Action Plan		X	
	Program 6	Increase MDIFW and DMR nongame fish and wildlife staff and capacity to help with SGCN conservation action implementation			X
	Program 7	Annually compile agency and partner expenditures and seek additional match opportunities to maximize efficiency and impact of 2015 Action Plan implementation	X		
	Program 8	Track SWAP conservation action implementation accomplishments by agencies and partners	X		
Action Development	Program 9	Develop SMART (Specific, Measurable, Achievable, Results-oriented, and Time-bound) style objectives for high priority habitat-scale and SGCN conservation actions		X	
Regional Partnerships	Program 10	Identify new and review/update existing SGCN Conservation Opportunity Areas, including *Beginning with Habitat* Focus Areas, using SGCN distribution data, resilient landscapes analyses, and landscape planning concepts	X		
	Program 11	Participate in the Northeast Regional Conservation Needs (RCN) Grant Program following annual endorsements from Maine's Action Plan implementation committee (*tentative*)		X	

6.5 AN APPROACH TO PRIORITIZING CONSERVATION EFFORTS

6.5.1 Uses for Prioritization Considerations:

Maine's 2015 Wildlife Action Plan needs to be a tightly prioritized plan because State Wildlife Grant (SWG) funds are limited and the number of SGCN is large. As discussed in 6.1.2, we have already prioritized in a number of important ways:

- We assigned SGCN to three priority levels.
- We ranked stressors and did not comprehensively develop conservation proposals for any stressors that were ranked less than high or medium-high
- Conservation actions on behalf of SGCN and habitats were also ranked by biological priority (e.g. Critical, High, Moderate).

With regard to the approximately 30 habitat conservation themes (Section 6.3.4), rather than prioritizing among these per se, we have provided information for each on the number and priority level of the SGCN and habitats they are designed to address. We hope this will help partners evaluate the nature of their likely impact.

In the sections below, we propose a suite of criteria for MDIFW, DMR and partners to use in focusing their conservation resources towards selected conservation actions during implementation of the plan. These criteria could also form the basis for MDIFW to select proposals for SWG funding, although for proposals competing for SWG funding, there are likely to be additional criteria and considerations, such as whether the proposal has clear and measurable objectives and the amount of non-federal, non-MDIFW funds offered.

6.5.2 Potential Criteria for Prioritizing Conservation Actions

A. Biological Impact Considerations

The overarching concept is that - all other things being equal - actions that benefit Priority 1 SGCN, i.e. those at most immediate risk of extirpation from Maine, should be higher priority than those for Priority 2 and greater than Priority 3. Actions that benefit multiple SGCN should have priority over those that benefit only a single species. Actions that impact a larger geographic scale should have priority over those that impact only a small area.

1. **Degree of Impact:** Will the proposed action or suite of actions significantly affect the conservation status of the SGCN(s) and/or its habitat (e.g., improved distribution, abundance, or viability essential to avoiding extirpation)?

2. **Scope of Impact:** Will the proposed action or suite of actions significantly affect the conservation status of multiple SGCN or multiple habitats or facilitate multiple actions for multiple SGCN and their habitats at a state-wide level?

3. **Endurance of Impact:** Will the proposed actions likely have lasting impact (e.g., even in the face of significant sea level rise or other impacts of a changing climate)?

4. **Regional/National Collaboration:** Are the proposed actions recommended through an established regional or national conservation initiative, such that the certainty of impact is

greater through increased peer review of approach, experience in implementation or evidence of success, as well as amplification of impact through regional networking?

B. Feasibility Considerations

1. **Partnership:** Does the proposal enhance opportunities for SWAP partner collaboration, and are partners willing and able to participate?

2. **Public Support:** Does the proposal conserve SGCN of high economic, social, or cultural value such that it is likely to have strong support from relevant sectors and/or the general public?

3. **Capacity:** Does MDIFW and/or the conservation partners have the necessary expertise, staff capacity and resources to successfully complete the proposal?

4. **Value (Cost-Benefit Ratio)**: How do the proposal's likely costs compare to its likely impact? (Figure 6-3).

Figure 6-3: Cost-benefit matrix of conservation proposals

COST	**BENEFIT**		
	HIGH – long lasting, very high improvement in viability for multiple highly ranked SGCN	MEDIUM	LOW
Low	Worth the effort	Likely worth the effort	Proposal needs revision, or consider other actions
Medium	Likely worth the effort	Find ways to increase benefit and reduce cost	Proposal needs revision, or consider other actions
High	Find funds to do it	Proposal needs revision, or consider other actions	Likely not worth the effort

Table 6-1 Conservation Actions assigned to Taxonomic Groups				
Taxanomic Groups	**Category**	**Biological Priority**	**Type**	**Description**
Birds, Reptiles, Amphibians, and Invertebrates, Inland Fish, Mammals	Habitat Management	High	On-going	Map and distribute information on species distribution, habitat requirements, and required Conservation Actions through programs such as Beginning with Habitat, with a goal of increased voluntary conservation by landowners, towns, and land trusts
Birds, Reptiles, Amphibians, and Invertebrates, Inland Fish, Mammals, Marine	Policy	High	New	Develop habitat management recommendations for all Priority 1 and Priority 2 SGCN and Guilds that are sensitive to certain intensive forest management practices
				Review and update SGCN distribution maps on a regular basis throughout the Action Plan implementation period
				Ensure ETSC database tracking is in place and accurate for all Priority 1 SGCN, and develop a system for prioritizing ETSC database tracking for a higher proportion of Priority 2 SGCN than are currently tracked
				Integrate SGCN habitat needs and Conservation Actions more explicitly into MDIFW Wildlife Management Area Plan reviews and updates, while maintaining the original management goals for each property
		Moderate	New	Develop conservation actions for all medium-ranked stressors assigned to Priority 1 and Priority 2 SGCN
		High	On-going	Conduct a comprehensive review of S-ranks and share with Natureserve
				Continue and improve quality of mapping and tracking of documented populations using MDIFW's ETSC database
	Public Outreach	High	New	Provide increased partner and public access to SGCN species reports, maps, and conservation actions through MEGIS, or other venues
			On-going	Increase public awareness of the economic and ecological value of SGCN and their conservation needs
Marine	Habitat Management	High	On-going	Assess new aquaculture sites for potential positive, benign, or negative species interactions. Continue to review the presence of and impacts to ecologically sensitive species and areas during the review process.
	Public Outreach	High	On-going	Increase capacity for collaborative data collection and management that fosters partnerships among harvesters, citizens, scientists, and managers
				Increased leadership and education regarding climate change mitigation and adaptation
	Research	Critical	On-going	Create species distribution maps to facilitate reduced response time to potential oil spills by creating 'hot' zones
		High	New	Conduct research to evaluate the impacts (including sublethal/lethal effects) of nutrients, chemicals, and other pollutants on marine SGCN to

				better understand risks to exposure, and monitor natural environments to understand where these stressors may be impacting SGCN
				Conduct laboratory and in situ research to understand the direct and indirect impacts of climate change (e.g. warming ocean temperatures, decreased salinity, increased eutrophication) and ocean acidification on individual species, food webs, and ecosystem functioning
				Conduct research to better understand impacts on marine SGCN and recovery from mechanical disturbances at various scales (e.g. dredging, dredge disposal, offshore infrastructure construction, mineral mining, etc.).
			On-going	Improve understanding of non-harvested species through targeted data collection, habitat surveys, and other efforts
				Map species distributions and abundances to track changes over time, identify ecologically important areas for multiple SGCN, andexamine ecosystem interactions and predator-prey relationships.
				Investigate biological effects (both lethal and sublethal) of oil spills and related treatments and response techniques including oil dispersants, burnring, etc., as well as the short and long term effect of oil spills
				Determine accuracy of harvester and dealer reported landings for target species and bycatch.
		Moderate	On-going	Research the impacts of diversifying Maine's marine fisheries on both non-commercial and commercially important SGCN
	Survey and Monitoring	High	On-going	Conduct surveys to monitor and better understand distribution and abundance
				Improve evaluation of commercially-harvested intertidal and subtidal SGCN through designation of conserved areas and rotational management (e.g., scallops)
		Moderate	On-going	Create an incentive-based reporting tool for non-commercial bycatch
Birds	Survey and Monitoring	High	New	Improve documentation of breeding status and distribution through an update to the Maine Breeding Bird Atlas
Reptiles, Amphibians, and Invertebrates	Survey and Monitoring	High	On-going	Implement targeted professional surveys to better understand species distribution and status and to help direct conservation actions to newly documented populations

Table 6-2 Conservation Actions assigned to Bird Guilds					
Guild	**Species**	**Category**	**Biological Priority**	**Type**	**Description**
Grassland birds	Northern Harrier, Upland Sandpiper, American Kestrel, Horned Lark, Grasshopper Sparrow, Field Sparrow, Bobolink, Eastern Meadowlark, Short-eared Owl, Barn Owl	Public Outreach	High	New	Develop program to inform small landowners of the best methods for keeping fields open and suitable for nesting by for grassland wildlife
		Species Management	High	New	Develop a BMP guide, linked with incentives, for farmers to minimize negative effects of cutting hay/silage during the grassland bird nesting season. NRCS recommendations should be viewed as a start with increased emphasis on timing, field size, and bird behavioral cues.
Island Nesting Seabirds	Razorbill, Atlantic Puffin, Laughing Gull, Roseate Tern, Common Tern, Arctic Tern, Leach's Storm-petrel, Great Cormorant	Research	High	New	Determine the association with commercial fisheries and climate-induced changes to food availability
				On-going	Determine which factors influence colony loss or failure
		Survey and Monitoring	High	On-going	Continue seabird restoration activities at historic nesting sites using social attraction, vegetation management, and predator control
Marsh birds	Black Tern, Yellow Rail, American Coot, Common Gallinule, Sora, Sedge Wren, American Bittern, Least Bittern, Pied-billed Grebe	Habitat Management	High	New	Work with landowners to maximize hemi-marsh conditions and maintain stable water levels.
		Species Management	Moderate	New	Work with landowners to develop and post signs or other strategies for discouraging recreational users from disturbing nesting birds.
		Survey and Monitoring	High	New	Implement targeted surveys to better understand the distribution and status of this species and to help direct conservation actions to newly documented populations
Shorebirds	Black-bellied Plover, American Oystercatcher, Ruddy Turnstone, Sanderling, Dunlin, Red Knot,	Habitat Management	High	On-going	Provide recommendations through the environmental permit review process that will minimize habitat loss and associated disturbance from development, docks/piers, rip rap, seawalls, and dredging projects.
			Moderate	New	Use voluntary agreements, conservation easements, conservation tax abatements and incentives and acquisition to protect important

	Purple Sandpiper, Least Sandpiper, Semipalmated Sandpiper, Short-billed Dowitcher, Whimbrel, Red Phalarope, Lesser Yellowlegs, Greater Yellowlegs				habitats.
		Policy	Critical	New	Work with the Maine Department of Marine Resources to conduct research to determine the impact of macroalgae harvest on wintering waterfowl
		Public Outreach	High	On-going	Provide outreach to pet owners, beachgoers, kayakers, beach managers, and landowners to raise public awareness on shorebirds and on the impacts of disturbance from recreational activities in coastal areas.
		Research	High	New	Gain a better understanding of the extent and impacts of algae harvesting on staging and wintering shorebirds. Conduct longterm monitoring of ecosystem-wide impacts of cutting algae to determine potential impacts to shorebird habitats and invertebrate prey base.
				On-going	Identify prey resources in significant staging areas to determine potential limiting factors and optimal management techniques to promote these resources.
					Determine length of stay at stopover areas, site fidelity, local movements and premigration condition to determine if coastal habitats are meeting shorebird requirements for successful migration.
			Moderate	New	Determine limiting factors for SGCN shorebird species on breeding, migratory, or wintering areas, including OA and SLR
		Species Management	High	New	Place symbolic stake and twine fencing around important beach roosting areas with signage to identify roosting areas.
		Survey and Monitoring	High	On-going	Identify and map priority feeding and roosting areas including offshore habitats, and implement protection initiatives such as inclusion in existing Significant Wildlife Habitat provisions under NRPA. Enter data in IFW ETSC database for SWH mapping
					To determine population status continue monitoring program for SGCN shorebird species at high priority migration sites coastwide. Continue to coordinate with ISS, PRISM, Atlantic Flyway ESMP programs.

Table 6-3 Conservation Actions assigned to Reptile, Amphibian, and Invertebrate Guilds					
Guild	**Species**	**Category**	**Biological Priority**	**Type**	**Description**
Bumble Bees	Rusty-patched Bumble Bee, Ashton's Cuckoo Bumble Bee, Lemon Cuckoo Bumble Bee, Fernald's Cuckoo Bumble Bee, Yellow Bumble Bee, Brownbelted Bumble Bee, Indiscriminate Cuckoo Bumble Bee , American Bumble Bee, Sanderson's Bumble Bee, Yellowbanded Bumble Bee	Public Outreach	Moderate	New	Develop and implement outreach materials to raise public awareness of native pollinator ecology, threats and conservation needs, and to encourage use of Integrated Pest Management practices.
		Research	High	New	Produce a statewide atlas and conservation assessment
		Survey and Monitoring	High	On-going	Conduct statewide surveys to document species diversity, distribution and relative abundance.
Dry Barrens Lepidoptera	Dusted Skipper, Sleepy Duskywing, Leonard's Skipper, Cobweb Skipper, Southern Cloudywing, Edwards' Hairstreak, Coral Hairstreak, Similar Underwing, Oblique Zale, Barrens Itame, Twilight Moth, Barrens	Habitat Management	Critical	New	Conduct a statewide review of potential high quality barrens habitat that is threatened by succession and identify strategic habitat restoration actions for implementation by key conservation partners.
		Species Management	Critical	New	Prepare occurrence maps and pesticide spray consultation guidelines for rare Lepidoptera and distribute to strategic partners including Maine Bureau of Pesticides Control

	Metarranthis Moth, Nepytia pellucidaria, Chaetaglaea ce				
Forested Wetlands Lepidoptera	Hessel's Hairstreak, Satyr Comma, Appalachian Brown, Spicebush Swallowtail	Research	High	New	Prepare a statewide atlas and conservation assessment.
Lacustrine Odonates	Comet Darner, Dusky Dancer, Tule Bluet, Big Bluet, New England Bluet, Scarlet Bluet, Citrine Forktail, Rambur's Forktail, Ringed Emerald, Lilypad Clubtail, Common Sanddragon, Needhams Skimmer, Carolina Saddlebags, Black Saddlebags, Martha's Pennant	Research	High	New	Prepare a statewide atlas and conservation assessment.
Palustrine Odonates	Sedge Darner, Swamp Darner, Spatterdock Darner, Quebec Emerald, Ringed Boghaunter, Canada Whiteface, Painted Skimmer, Zigzag Darner, Incurvate Emerald, Elfin Skimmer	Research	High	New	Prepare a statewide atlas and conservation assessment.
Peatland	Bog Elfin, Clayton's	Species	Critical	New	Prepare occurrence maps and pesticide spray consultation

Lepidoptera	Copper, Crowberry Blue, Frigga Fritillary, New England Buckmoth	Management			guidelines for rare Lepidoptera and distribute to strategic partners including Maine Bureau of Pesticides Control.
Riverine Odonates	Arrowhead Spiketail, Broadtailed Shadowdragon, Rapids Clubtail, Cobra Clubtail, Southern Pygmy Clubtail, Extra-striped Snaketail, Boreal Snaketail, Pygmy Snaketail, Arrow Clubtail, Ocellated Emerald	Research	high	New	Prepare a statewide atlas and conservation assessment.

Table 6-4 Conservation Actions assigned to Inland Fish Guilds

Guild	Species	Category	Biological Priority	Type	Description
Rare Minnows	Creek Chubsucker, Eastern Silvery Minnow, Pearl Dace, Bridle Shiner, Blacknose Shiner, Longnose Dace	Research	Critical	New	Determine population abundance, habitat use, size and age structure and interaction with other fish species in representative waters
					Develop a robust, reliable method to assess population trends, habitat associations, and geographic distribution.
					Determine susceptibility and risks associated with certain disease scenarios
Whitefishes	Lake Whitefish, Round Whitefish	Habitat Management	High	On-going	Cooperate with regulatory agencies and landowners in land and water use planning and enforcement to prevent habitat degradation.
		Research	Critical	On-going	Determine population abundance, habitat use, size and age structure and interaction with other fish species in representative waters
			High	On-going	Identify factors that have contributed to declining populations of lake whitefish.
		Species Management	Critical	On-going	Develop and implement rehabilitation programs for fisheries that have declined.

Table 6-5 Conservation Actions assigned to Mammal Guilds					
Guild	**Species**	**Category**	**Biological Priority**	**Type**	**Description**
Cave bats	Big Brown Bat, Eastern Smallfooted Myotis, Little Brown Bat, Northern Long-eared Myotis, Tricolored Bat	Policy	High	On-going	Through the environmental review process, continue to apply curtailment standards to all wind projects and require pre and post construction monitoring to assess potential impacts to bats
		Public Outreach	Moderate	New	Investigate the feasibility of gating known hibernaculum.
		Research	High	On-going	Conduct research and monitoring to address knowledge gaps, with a focus on developing baseline presence/absence data, monitoring and identifying new hibernaculums, and furthering our understanding of habitat selection by cave bat species, including the use of cavity trees

Table 6-6 Conservation Actions assigned to Marine Guilds				
Species	**Category**	**Biological Priority**	**Type**	**Description**
Bivalves	Policy	Critical	New	Through education and collaboration, reduce the use of antifouling agents and biocides that negatively affect SGCN, and investigate alternative biofouling agents.
Brachiopod	Policy	Critical	New	Reduce the collection and possession of live specimens Through education and collaboration, reduce the use of antifouling agents and biocides that negatively affect SGCN, and investigate alternative biofouling agents.
	Public Outreach	High	On-going	Encourage the use of more targeted fishing gear in order to reduce bycatch and habitat disturbance
	Research	High	New	Develop molecular tools to identify where specimens are collected.
Cnidaria	Policy	Critical	New	Reduce the collection and possession of live specimens Through education and collaboration, reduce the use of antifouling agents and biocides that negatively affect SGCN, and investigate alternative biofouling agents.
	Public Outreach	High	On-going	Encourage the use of more targeted fishing gear in order to reduce bycatch and habitat disturbance
	Research	High	New	Develop molecular tools to identify where specimens are collected.
Diadromous Fish	Policy	High	On-going	Encourage improved municipal planning for siting for new or retrofitting development, taking into account future environmental change, to improve connectivity for diadromous fish passage
	Public Outreach	High	On-going	Conduct education to increase awareness of the importance of these species to maintaining productive ecosystem functioning. Expand existing education or incentives to change behavior (for lawn care companies, homeowners, and municipalities). Encourage the use of more targeted fishing gear in order to reduce bycatch and habitat disturbance
		Moderate	On-going	Continue to work with the fishing industry to develop gear modifications that reduce of bycatch of diadromous fishes
	Research	Critical	On-going	Determine the location and timing of critical habitat use (for endangered species) and important habitat use for diadromous fishes at different life history stages
		High	New	Improve understanding of the relative roles of natural predation, fishing mortality, and climate change in stock dynamics
			On-going	Improve understanding of species distribution especially in regards to ecosystem interactions, predator-prey relationships, and prey buffering concepts

				Ground-truth mapped habitat and compare to historical maps to monitor change over time, may require updating mapping plans to map more frequently
				Gather information to support management, including stock assessments, population genetics, population monitoring, etc.
	Survey and Monitoring	Critical	On-going	Monitor population stock status through surveys and sampling programs
Echinoderms	Policy	Critical	New	Through education and collaboration, reduce the use of antifouling agents and biocides that negatively affect SGCN, and investigate alternative biofouling agents.
	Public Outreach	High	On-going	Encourage the use of more targeted fishing gear in order to reduce bycatch and habitat disturbance
				Encourage the use of more targeted fishing gear in order to reduce bycatch and habitat disturbance
	Research	High	New	Investigate the effect of various harvesting practices on the integrity of habitats and trophic and ecological systems
				Research to understand how effects such as habitat modifications, population changes, and pollution can influence SGCN
				Identify species that are resilient to ocean acidification (OA) and rises in sea surface temperature (SST).
			On-going	Expand existing education and research among researchers and managers to improve understanding and management ability
				Conduct research to support management, including but not limited to stock assessments, population genetics, population monitoring, etc.
	Survey and Monitoring	High	New	Ground-truth mapped habitat and compare to historical maps to monitor change over time, may require updating mapping plans to map more frequently
Gastropods	Policy	Critical	New	Reduce the collection and possession of live specimens
				Reduce the use of tributilyn compounds as a biocide and antifouling prophalactic
	Public Outreach	High	On-going	Encourage the use of more targeted fishing gear in order to reduce bycatch and habitat disturbance
	Research	High	New	Develop molecular tools to identify where specimens are collected.
	Survey and Monitoring	High	New	Ground-truth mapped habitat and compare to historical maps to monitor change over time, may require updating mapping plans to map more frequently
Seaturtles	Habitat Management	Moderate	On-going	Reduce the amount of ghost gear that could increase the risk of entanglement for sea turtles
	Public Outreach	High	New	Conduct outreach with fishermen to increase reporting for entangled turtles
		Moderate	New	Conduct outreach and trainings to improve the detection of and response time to entangled turtles in Maine waters
			On-going	Continue to work with the fishing industry to develop gear modifications that reduce the risk of entanglement and conduct outreach on gear best practices to

				use
	Survey and Monitoring	Critical	On-going	Conduct baseline surveys to determine the seasonal density and distribution of fixed fishing gear
		High	On-going	Gather baseline data on the configurations of fixed fishing gear used as a function of seasonality and distance from shore.
		Moderate	New	Conduct surveys (aerial, boat based) to determine the distribution of sea turtles in the coastal waters of Maine
Shrimp	Policy	Critical	New	Through education and collaboration, reduce the use of antifouling agents and biocides that negatively affect SGCN, and investigate alternative biofouling agents.
	Research	High	New	Develop molecular tools to identify where specimens are collected.
			On-going	Expand existing education and research among researchers and managers to improve understanding and close data loopholes in order to inform management
	Survey and Monitoring	High	New	Ground-truth mapped habitat and compare to historical maps to monitor change over time, may require updating mapping plans to map more frequently
Whales	Habitat Management	Moderate	On-going	Reduce the amount of ghost gear that could increase the risk of entanglement for large whales
	Public Outreach	High	On-going	Continue to work with the fishing industry to develop gear modifications that reduce the risk of entanglement and conduct outreach on gear best practices to use
		Moderate	On-going	Conduct outreach and trainings to improve the detection of and response time to entangled whales in Maine waters
	Survey and Monitoring	Critical	New	Conduct surveys (aerial, boat based and/or passive acoustic) to determine the distribution of large whales in the coastal waters of Maine
			On-going	Conduct baseline surveys to determine the seasonal density and distribution of fixed fishing gear
		High	On-going	Gather baseline data on the configurations of fixed fishing gear used as a function of seasonality and distance from shore.
				Determine the high overlap areas between whales, high risk behaviors or persistent habitat use and fixed fishing gear

Table 6-7 Conservation Actions assigned to Bird SGCN				
Species	**Category**	**Biological Priority**	**Type**	**Description**
Bank Swallow, Riparia riparia	Public Outreach	High	New	Develop Best Management Practices for gravel pit operators and for reclamation of abandoned pits
	Research	Critical	New	Gather more information on the influence of Neonoctinoid (systemic) pesticides on populations of aerial insectivores.
Bicknell's Thrush, Catharus bicknelli	Habitat Management	High	New	Encourage landowners to manage the amount and timing of pre-commercial thinning in areas occupied by this species, and to leave residual patches in areas that are thinned
				Encourage land managers to rotate harvests and create a mixed distribution of stand ages, which might undergo pre-commercial thinning and cutting at different times, thus temporally balancing the amount of habitat available at a given time.
	Policy	High	New	For suitable/occupied habitat on public lands (BPL) incorporate stand management BMPs into public land management policy.
	Research	High	New	Determine how this species responds to specific forestry practices on the landscape.
				Assess the effects of climate change on habitat loss, occupancy, and predicted range shift.
				Evaluate the effects of high elevation development such as Wind Power on habitat quality and long-term persistence of occupied sites.
	Species Management	Critical	New	Work to ensure that developments at high elevation that entail land clearing, specifically permanent conversion of forest to non-forest (road, gravel, grass) avoid areas occupied by Bicknell's Thrush
		High	On-going	Participate in work of International Bicknell's Thrush Conservation Group (IBTCG) to track progress on conservation and research actions, discuss funding needs and revise the action plan as appropriate to ensure that emerging information is used to inform groups working to conserve Bicknell's Thrush across its range and to strengthen links among these groups.
	Survey and Monitoring	High	On-going	Support Mountain Birdwatch 2.0, an international, volunteer-based program to track Bicknell's Thrush populations across their breeding range.
Black-crowned Night-heron, Nycticorax	Research	High	New	Determine whether prefledging success and productivity rates are contributing to declining numbers
		Moderate	New	Investigate effect of aerial predators (gulls, crows, eagles) on nesting success.
	Species Management	Moderate	New	Develop outreach program to educate landowners and recreational users about black-crowned night herons' breeding habitat requirements and sensitivity to

nycticorax				disturbance.
				In cooperation with landowners and partners, develop and post signs at colonies encouraging users to keep a wide berth during nesting.
	Survey and Monitoring	High	New	Implement targeted surveys to better understand the distribution and status of this species and to help direct conservation actions to newly documented populations
Eastern Meadowlark, Sturnella magna	Habitat Management	Critical	New	Improve habitat quality and abundance.
Grasshopper Sparrow, Ammodramus savannarum	Habitat Management	Critical	New	Conduct landscape analysis to determine potential for other sites for this species, what management would be necessary, and current ownership
		High	On-going	Maintain known nesting areas in native grasses, little bluestem, or low-growing shrubs like lowbush blueberry and prevent conversion to other land uses
		Moderate	New	Reduce commercial gravel and sand mining in grasslands and blueberry barrens of suitable size for this species. Restore old gravel pits and agricultural fields to grasslands and low shrubs
	Public Outreach	Critical	New	Contact landowners at formerly occupied (Wells, Sanford) and potential sites (near Poland) to examine opportunities for habitat enhancement and management of species.
	Research	Critical	New	Conduct research on population status, productivity levels, and limiting factors at indiv sites, and use this information to update a Population Viability Analysis
		High	New	Assess effects of past and present management practices at the Kennebunk Plains by comparing with longterm population data by management unit over time
	Survey and Monitoring	Critical	On-going	Continue to monitor populations at Kennebunk Plains and the former Naval Air Station in Brunswick
		High	New	Expand monitoring effort to other potential or previously occupied sites (Sanford Airport, Wells Barrens, Poland Spring fields)
Greater Scaup, Aythya marila	Public Outreach	High	On-going	Install signage at boat ramps
	Survey and Monitoring	High	On-going	Continue monitoring through the mid-winter waterfowl survey
Harlequin Duck, Histrionicus histrionicus	Habitat Management	Critical	New	Continue to work with the Maine Department of Marine Resources to coordinate macroalgae harvest in important wintering sites
Least Tern, Sternula antillarum	Habitat Management	High	On-going	Develop long-term, non-regulatory habitat protection via management agreements, conservation easements, or acquisition.
	Public Outreach	High	On-going	Continue efforts to educate beach recreationalists, landowners and municipal officials regarding ecology and life history requirements.
	Species	Critical	On-	Continue current management activities including: stake and twine symbolic

	Management		going	fencing around nesting areas, exclosures around colonies, posting signage to identify nesting areas, and locating and monitoring nesting pairs.
	Survey and Monitoring	Critical	On-going	Continue targeted management of native and nonnative predators at nesting and brood rearing areas, including lethal and nonlethal methods
		High	On-going	Continue efforts to annually monitor abundance, distribution, and productivity.
		Moderate	On-going	Continue efforts to recruit and provide training sessions for volunteer beach monitors.
Lesser Yellowlegs, Tringa flavipes	Research	High	New	To determine if recent population declines are due to impacts occurring in Maine, conduct research to: identify food quality and quantity at lesser yellowleg staging areas; assess premigration body condition; length of stay; other potential limiting factors
	Survey and Monitoring	High	New	Survey inland wetlands to identify and map important inland staging areas. Determine if mapped areas are adequately protected through Significant Wildlife Habitat under NRPA or conservation ownership.
Nelson's Sparrow, Ammodramus nelsoni	Research	High	New	Investigate what role, if any, non-native invasive species have in habitat loss or reduction in habitat quality. Determine mitigation measures appropriate for Maine saltmarshes.
		Moderate	New	Assess whether Mercury is a problem at marshes across Maine and whether certain marshes pose a higher risk
				Determine the relative impacts of point source (landfills) vs non-point source (atmospheric) contamination by Mercury on post-fledgling survival
	Survey and Monitoring	High	New	Develop a long-term monitoring program which allows for evaluation of effects of human perturbations, natural changes to habitat and management actions to reverse/mitigate such actions.
Peregrine Falcon, Falco peregrinus	Public Outreach	Moderate	New	Develop an information pamphlet and website content focused on the importance of hikers and rock climbers limiting disturbance to nesting peregrines.
	Species Management	High	On-going	Prevent seasonal disturbances within 1/4 mile of occupied nests
				Maintain trail closures until five weeks after the last bird has fledged
Piping Plover, Charadrius melodus	Habitat Management	High	On-going	Develop long-term, non-regulatory habitat protection via management agreements, conservation easements, or acquisition.
	Public Outreach	High	On-going	Continue efforts to educate beach recreationalists, landowners and municipal officials regarding ecology and life history requirements.
	Species Management	Critical	On-going	Continue current management activities including: stake and twine symbolic fencing around nesting areas, exclosures around nests, posting signage to identify nesting areas, and locating and monitoring nesting pairs.
			On-going	Conduct intensive predator management including lethal and nonlethal removal of native and nonnative predators from nesting and brood rearing areas.

	Survey and Monitoring	High	On-going	Continue efforts to annually monitor abundance, distribution, and productivity.
		Moderate	On-going	Continue efforts to recruit and provide training sessions for volunteer beach monitors.
Purple Martin, Progne subis	Habitat Management	High	New	Support further development, and increase awareness of, existing BMPs for purple martin colony management in concert with Purple Martin Conservation Association
	Public Outreach	High	On-going	Increase public awareness of the Purple Martin Conservation Association and its activities
	Research	High	On-going	Support Scout Arrival Study, monitoring of arrival times, through Purple Martin Conservation Association
				Support Purple Martin Nest Cavity Research Project which uses mini martin cams to monitor nestling development and engage volunteers; consider a live web cam
	Species Management	High	New	Provide support or otherwise increase awareness of the mentor program for Purple Martin colony landlords consistent with efforts of the Purple Martin Conservation Association
	Survey and Monitoring	Critical	New	Conduct an inventory of breeding colonies, possibly using eBird.
		High	On-going	Promote the registration of existing colonies through Purple Martin Conservation Association
				Support Project Martinwatch, a weekly nest monitoring program, through Purple Martin Conservation Association
Purple Sandpiper, Calidris maritima	Habitat Management	Critical	New	Continue to work with the Maine Department of Marine Resources to coordinate macroalgae harvest in important wintering sites
	Survey and Monitoring	Critical	On-going	Continue annual long term monitoring plan to determine if the Purple Sandpiper population is in severe decline. Combine annual survey with a coastwide survey to be conducted every 5 years.
Red Knot, Calidris canutus rufa	Species Management	High	New	Partner with municipalities and BP&L to develop beach management agreements, and municipal ordinance to minimize impacts to feeding and roosting red knots using beach habitats.
Red-necked Phalarope, Phalaropus lobatus	Policy	High	New	Site wind/tidal energy projects away from mapped red-necked phalarope current or historical staging areas through enviromental permit review.
Roseate Tern, Sterna dougallii	Species Management	High	On-going	Increase breeding population distribution and productivity
Rusty Blackbird, Euphagus carolinus	Research	High	New	Examine the food web of boreal forest wetlands and determine the role of aquatic invertebrates (Tricoptera, Odonata) in maintaining Rusty Blackbird abundance and productivity.

				Investigate postfledging habitat use relative to timber harvest practices
				Evaluate the effects of precommercial thinning on nesting habitat quality and determine whether nesting success is more sensitive to pre-commercial thinning in some landscapes than in others
			On-going	Support cross-agency data sharing to better understand breeding range-wide survival and fecundity.
	Species Management	High	New	Work with partners on wintering grounds to develop a full life cycle model of Demography
Saltmarsh Sparrow, Ammodramus caudacutus	Habitat Management	High	On-going	Support current Phragmites control efforts in sourthern Maine and expand to other regions as needed. Monitor effectiveness by conducting point counts to determine bird response.
	Research	High	New	Assess whether Mercury is a problem at marshes across Maine and whether certain marshes pose a higher risk
				Determine the relative impacts of point source (river-born) vs non-point source (atmospheric) contamination by Mercury.
				Investigate what role, if any, non-native invasive species have in habitat loss or reduction in habitat quality. Determine mitigation measures appropriate for Maine saltmarshes.
		Moderate	New	Determine whether the restoration of tidal action would improve resiliency to sea level rise and whether restricted areas would serve as high marsh refugia, at least temporarily
	Species Management	Moderate	New	Determine whether gene flow from Nelson's sparrow will lead to loss of Saltmarsh Sparrow genotype from Maine, and whether certain marshes may be more resistant to hybridization
	Survey and Monitoring	Critical	New	Develop a long-term monitoring program which allows for evaluation of effects of human perturbations, natural changes to habitat and management actions to reverse/mitigate such actions.
Solitary Sandpiper, Tringa solitaria	Policy	Moderate	New	Include important solitary sandpiper inland staging areas in existing Significant Wildlife Habitat provisions under NRPA.
	Survey and Monitoring	High	New	Survey inland wetlands to identify and map important inland staging areas. Determine if mapped areas are adequately protected through Significant Wildlife Habitat under NRPA or conservation ownership.
Upland Sandpiper, Bartramia longicauda	Survey and Monitoring	Critical	New	Support state and regional efforts to survey/inventory populations of Upland Sandpiper leading to an estimate of population trend
Whimbrel, Numenius phaeopus	Research	High	New	Determine population status, pre migration body condition, and importance of commercial blueberry barrens to staging whimbrels.
				Determine potential impacts from hazing and disturbance occurring on commercial blueberry barrens

Table 6-8 Conservation Actions assigned to Reptile, Amphibian, and Invertebrate SGCN				
Species	**Category**	**Biological Priority**	**Type**	**Description**
Bigmouth Pondsnail, Stagnicola mighelsi	Research	High	New	Examine effects of dams as well as water quality changes from residential and agricultural pollutant and nutrient runoff on bigmouth pondsnail populations
			On-going	Develop an improved understanding of habitat and movement ecology to help develop Best Management Practices and other targeted species conservation actions
Blanding's Turtle, Emydoidea blandingii	Habitat Management	Critical	On-going	Continue cooperation with the Maine Department of Environmental Protection in the review of Significant Vernal Pools, recommendations for their management, and location mapping
		High	New	Manage and where necessary create nesting habitat to improve viability of high-priority Blanding's turtle populations
				Research and coordinate the development of a publically available Potential Vernal Pool map product that covers the entire State, or at least all organized townships
	Policy	Moderate	On-going	Cooperate with University of Maine and the Maine Department of Environmental Protection to research and implement a voluntary Special Area Management Program (SAMP) by towns that want greater flexibility in the implementation of Significant Vernal Pool rules in designated growth areas.
	Public Outreach	High	On-going	Continue to build public awareness of risks posed by roadways with seasonally appropriate press release that also warns motorists to be on the lookout for turtles during spring/early summer.
	Research	Critical	On-going	Identify potential road crossing hotspots using GIS and monitor mortality at those locations with road surveys to prioritize the most problematic road segments for mitigation measures such as cautionary signage, exclusionary fencing, and under-road passages
	Species Management	Critical	New	Install road crossing structures consisting of under-road passageways and guidance fencing where high-mortality road segments bisect habitat that hosts high priority populations
		High	On-going	Continue the cautionary road crossing signage program, and expand the number of locations with signs as additional road crossing hotspots are identified.
Blue-spotted Salamander, Ambystoma laterale	Habitat Management	Critical	On-going	Continue cooperation with the Maine Department of Environmental Protection in the review of Significant Vernal Pools, recommendations for their management, and location mapping
	Policy	Moderate	On-going	Cooperate with University of Maine and the Maine Department of Environmental Protection to research and implement a voluntary Special Area

				Management Program (SAMP) by towns that want greater flexibility in the implementation of Significant Vernal Pool rules in designated growth areas.
	Research	High	On-going	Develop an improved understanding of habitat and movement ecology to help develop Best Management Practices and other targeted species conservation actions
	Survey and Monitoring	High	On-going	Pure diploid (and non-hybrid) populations of Ambystoma laterale are believed to be rare in Maine and throughout their range. Systematic tissue sampling is needed to document the extent and distribution of all genotypes within the species complex, with a focus on identifying cryptic diploid populations requiring potential targeted conservation attention
Brook Floater, Alasmidonta varicosa	Survey and Monitoring	Critical	On-going	Develop and implement a systematic protocol for monitoring population size, demographics, and trends.
Clayton's Copper, Lycaena dorcas claytoni	Habitat Management	Critical	New	Conduct selective thinning at sites where forest canopy is encroaching and shading out host plant stands.
	Research	High	New	Prepare a statewide atlas and conservation assessment.
	Survey and Monitoring	Critical	On-going	Develop and implement a systematic protocol for monitoring population size, demographics, and trends.
Cobblestone Tiger Beetle, Cicindela marginipennis	Research	High	New	Develop an improved understanding of habitat and movement ecology to help develop Best Management Practices and other targeted species conservation actions
Crowberry Blue, Plebejus idas empetri	Research	High	New	Prepare a statewide atlas and conservation assessment.
Early Hairstreak, Erora laeta	Research	High	New	Prepare a statewide atlas and conservation assessment.
Eastern Ribbon Snake, Thamnophis sauritus	Habitat Management	Critical	On-going	Continue cooperation with the Maine Department of Environmental Protection in the review of Significant Vernal Pools, recommendations for their management, and location mapping
		High	New	Research and coordinate the development of a publically available Potential Vernal Pool map product that covers the entire State, or at least all organized townships
	Policy	Moderate	On-going	Cooperate with University of Maine and the Maine Department of Environmental Protection to research and implement a voluntary Special Area Management Program (SAMP) by towns that want greater flexibility in the implementation of Significant Vernal Pool rules in designated growth areas.
	Research	High	New	Develop an improved understanding of habitat and movement ecology to help develop Best Management Practices and other targeted species conservation actions
Edwards' Hairstreak,	Research	High	New	Prepare a statewide atlas and conservation assessment.

Satyrium edwardsii				
Hessel's Hairstreak, Callophrys hesseli	Habitat Management Species Management	Moderate Moderate	New New	Conduct a comprehensive review of silvicultural effects on Atlantic White Cedar habitat (e.g., regeneration, composition, structure) Develop Forestry Species Management Guidelines for distribution to cooperative landowners and forest management community.
Juniper Hairstreak, Callophrys gryneus **Katahdin Arctic, Oeneis polixenes katahdin**	Habitat Management	Critical	New	Research host tree regeneration ecology and develop site restoration management strategies for distribution to cooperative landowners.
	Research	High	New	Prepare a statewide atlas and conservation assessment.
	Habitat Management	High	New	Work with BSP and MNAP to develop tundra habitat monitoring procedures for assessing potential impacts from off-trail recreation.
	Research	High	New	Prepare a statewide atlas and conservation assessment.
	Survey and Monitoring	High	New	Work with Baxter State Park to develop species monitoring protocols that are robust enough to detect potential trends in population size.
Northern Black Racer, Coluber constrictor constrictor	Habitat Management	Critical	On-going	Manage black racer habitat to improve and expand upon habitat that is available where populations occur.
	Survey and Monitoring	Moderate	New	Identify potential road crossing hotspots using GIS and monitor mortality at those locations with road surveys to prioritize the most problematic road segments for mitigation measures such as cautionary signage, exclusionary fencing, and under-road passages.
Northern Blue, Plebejus idas	Research	High	New	Prepare a statewide atlas and conservation assessment.
	Species Management	Critical	New	Prepare occurrence maps and pesticide spray consultation guidelines for rare Lepidoptera and distribute to strategic partners including Maine Bureau of Pesticides Control.
Northern Brownsnake, Storeria dekayi dekayi	Survey and Monitoring	Moderate	New	Implement targeted professional surveys to better understand the distribution and status of this species and to help direct conservation actions to newly documented populations
Pine Barrens Zanclognatha, Zanclognatha martha	Survey and Monitoring	High	New	Develop and implement a systematic protocol for monitoring population size, demographics, and trends.
Purple Lesser Fritillary, Boloria chariclea grandis	Research	High	New	Prepare a statewide atlas and conservation assessment.
	Species Management	Critical	New	Prepare occurrence maps and pesticide spray consultation guidelines for rare Lepidoptera and distribute to strategic partners including Maine Bureau of Pesticides Control.
		Moderate	New	Develop Forestry Species Management Guidelines for distribution to cooperative landowners and forest management community.
Rapids Clubtail, Gomphus quadricolor	Survey and Monitoring	Critical	New	Conduct surveys to determine the status of the historic population(s) on the Saco River. This species may no longer be extant in Maine.
Ringed Boghaunter,	Research	High	New	Develop an improved understanding of habitat and movement ecology to help

Williamsonia lintneri				develop Best Management Practices and other targeted species conservation actions
Roaring Brook Mayfly, Epeorus frisoni	Survey and Monitoring	High	On-going	Develop and implement a systematic protocol for monitoring population size, demographics, and trends.
Sleepy Duskywing, Erynnis brizo	Research	High	New	Prepare a statewide atlas and conservation assessment.
Spotted Turtle, Clemmys guttata	Habitat Management	Critical	On-going	Continue cooperation with the Maine Department of Environmental Protection in the review of Significant Vernal Pools, recommendations for their management, and location mapping
		High	New	Research and coordinate the development of a publically available Potential Vernal Pool map product that covers the entire State, or at least all organized townships
	Policy	Moderate	On-going	Cooperate with University of Maine and the Maine Department of Environmental Protection to research and implement a voluntary Special Area Management Program (SAMP) by towns that want greater flexibility in the implementation of Significant Vernal Pool rules in designated growth areas
	Public Outreach	High	On-going	Continue to build public awareness of risks posed by roadways with seasonally appropriate press release that also warns motorists to be on the lookout for turtles during spring/early summer.
	Species Management	Critical	New	Identify potential road crossing hotspots using GIS and monitor mortality at those locations with road surveys to prioritize the most problematic road segments for mitigation measures such as cautionary signage, exclusionary fencing, under-road passages
				Install road crossing structures consisting of under-road passageways and guidance fencing where high-mortality road segments bisect habitat that hosts high priority populations
		High	On-going	Continue the cautionary road crossing signage program, and expand the number of locations with signs as additional road crossing hotspots are identified.
				Deter casual collection by educating the public on the importance of leaving turtles where they find them
Tidewater Mucket, Leptodea ochracea	Survey and Monitoring	Critical	New	Develop and implement a systematic protocol for monitoring population size, demographics, and trends.
Tomah Mayfly, Siphlonisca aerodromia	Survey and Monitoring	High	On-going	Develop and implement a systematic protocol for monitoring population size, demographics, and trends.
Twilight Moth, Lycia rachelae	Research	High	New	Identify host plant(s) and document extent of habitat use outside Pitch Pine - Scrub Oak barrens
	Survey and	High	New	Develop and implement a systematic protocol for monitoring population size,

	Monitoring			demographics, and trends.
Wood Turtle, Glyptemys insculpta	Policy	High	On-going	Deter casual collection by educating the public on the importance of leaving turtles where they find them
	Public Outreach	Moderate	On-going	Continue to build public awareness of risks to wood turtles posed by roadways with seasonally appropriate press release that also warns motorists to be on the lookout for turtles during spring/early summer.
	Species Management	High	New	Install road crossing structures consisting of under-road passageways and guidance fencing where high-mortality road segments bisect habitat that hosts high priority populations
			On-going	Identify potential road crossing hotspots using GIS and monitor mortality at those locations with road surveys to prioritize the most problematic road segments for mitigation measures such as cautionary signage, exclusionary fencing, and under-road passages.
		Moderate	On-going	Expand cautionary road crossing signage program to include wood turtle as important road crossing hotspots are identified for this species.
	Survey and Monitoring	Critical	New	Develop and implement a systematic protocol for monitoring population size, demographics, and trends.

Table 6-9 Conservation Actions assigned to Inland Fish SGCN				
Species	**Category**	**Biological Priority**	**Type**	**Description**
Arctic Charr, Salvelinus alpinus oquassa	Habitat Management	High	On-going	Identify key aquatic habitats such as spawning sites and coordinate protection with federal, state, or NGOs and willing private landowners
				Identify key terrestrial habitats connected or adjacent to aquatic habitats that are essential to maintaining viability of populations
	Research	High	On-going	Investigate and describe all life history and life cycle requirements of each population to provide for maximum protection of each population
	Species Management	Critical	On-going	Assess population status at each location where the species is present
		High	On-going	Assess the utilization of charr by recreational anglers, including harvest rates and the attitudes of participating anglers
Redfin Pickerel, Esox americanus americanus	Habitat Management	Critical	On-going	Work with landowners to enhance and restore riparian buffers on redfin pickerel occupied streams within agricultural lands.
				Enhance and improve fish passage to proximal habitats so redfin pickerel can migrate to and colonize new habitats as necessary.
		High	On-going	Work with agricultural landowners to restrict or eliminate livestock access to streams occupied by redfin pickerel.
Swamp Darter, Etheostoma fusiforme	Research	High	New	Conduct research to develop and improved understanding of seasonal habitat requirements for all size and age classes
				Conduct research to develop an improved understanding of spawning ecology
				Conduct research to develop an improved understanding of trophic ecology
	Survey and Monitoring	High	On-going	Implement targeted professional surveys to better understand the distribution and status of this species and to help direct conservation actions to newly documented populations

Table 6-10 Conservation Actions assigned to Mammal SGCN				
Species	**Category**	**Biological Priority**	**Type**	**Description**
New England Cottontail, Sylvilagus transitionalis	Habitat Management	Critical	On-going	Restore early successional habitat in southern Maine following guidance in the New England Cottontail Conservation Strategy
	Public Outreach	High	On-going	Improve public perception of the value of early successional habitat following guidance in the New England Cottontail Conservation Strategy
	Species Management	High	On-going	Conduct a captive breeding program following guidance in the New England Cottontail Conservation Strategy
	Survey and Monitoring	High	New	Conduct active restoration of early-successional brushy habitat on both private and public lands in southern Maine, and monitor the success of habitat restoration using methodologies identified in the Rangewide Conservation Strategy
				Monitor released individuals from the captive breeding program using radio telemetry to determine survival and use of landscape. Alternatively, populations may be monitored using mark-recapture techniques that rely on genotype
Northern Bog Lemming, Synaptomys borealis sphagnicola	Policy	Moderate	On-going	Develop a policy where the Maine Forest Service or LURC would notify IFW of forest management plans where cutting was planned on high elevation sites (above 2,700 feet)
	Research	Moderate	New	Develop a technique to identify northern bog lemmings using e-DNA found in small water bodies associated with alpine sites

Table 6-11 Conservation Actions assigned to Marine SGCN				
Species	**Category**	**Biological Priority**	**Type**	**Description**
Alewife, Alosa pseudoharengus	Public Outreach	High	On-going	Identify priority locations for connectivity restoration and work with municipalities, local groups, and state and federal partners to restore access to historical habitat or improve access at partial barriers.
	Research	High	On-going	Increase understanding of fish passage efficiency in different fish passage designs including pool and weir, nature-like, Denil, and Alaskan steeppass
				Continue collecting biological samples to understand how age distribution, length at age, and repeat spawning ratios differ between long-term, recently restored, and rebuilding runs
		Moderate	New	Monitor multiple life stages of river herring to understand which stages may be experiencing high mortality
	Survey and Monitoring	Moderate	On-going	Update current and historical habitat maps representing spawning locations for alewife and blueback herring.
American Pelicanfoot, Arrhoges occidentalis	Public Outreach	High	New	Education to increase awareness of how the shell trade can reduce the economic value of natural systems.
American shad, Alosa sapidissima	Research	Critical	New	Conduct population estimates for Saco, Androscoggin, Kennebec/Sebasticook, and Penobscot rivers
		High	On-going	Conduct fishway efficiency studies that focus on shad passage at existing fishways
	Species Management	High	On-going	Increase access to historical spawning habitat through effective fish passage or dam removal
	Survey and Monitoring	Moderate	New	Ground-truth assumed current spawning habitat state-wide
				Map young-of-year habitat based on existing beach seine and in-river trawl surveys in the Kennebec River/Merrymeeting Bay estuary complex and Penobscot River
				Determine locations beyond those regularly monitored where American shad passage may be limited by human-made obstructions
			On-going	Monitor water chemistry (DO, turbidity, pH, temperature, conductivity) at known spawning grounds during May-July
Atlantic salmon, Salmo salar	Research	Critical	On-going	Continue to assess the causes of the precipitous decline in Atlantic salmon returning to Maine waters.
	Species Management	High	On-going	Continue to collaborate with NOAA on the Atlantic Salmon Recovery Framework and all recovery activities.
				Further develop the habitat restoration and connectivity program for Atlantic salmon.

	Survey and Monitoring	Critical	On-going	Continue to monitor the abundance and status of juvenile and adult salmon throughout the geographic range of the GOM DPS.
Atlantic sturgeon, Acipenser oxyrinchus oxyrinchus	Research	High	On-going	Characterize intersystem movements of shortnose and Atlantic sturgeon (e.g., which systems used, paths taken, timing and duration of movements).
		Moderate	On-going	Determine feeding habitat and trophic position of shortnose and Atlantic sturgeon in each system
				Investigate possibility of shortnose and Atlantic sturgeon scute elemental analysis as indicator of river of origin
	Species Management	High	New	Estimate current population size of shortnose and Atlantic sturgeon in major river systems in Maine.
			On-going	Determine sex and stage of maturity of shortnose and Atlantic sturgeon
Barndoor Skate, Dipturus laevis	Research	High	New	Develop an improved understanding of discard mortality rates Update life history data across species range
		Moderate	New	Determine the location and timing of important habitat use at different life history stages
Blueback Herring, Alosa aestivalis	Public Outreach	High	On-going	Identify priority locations for connectivity restoration and work with municipalities, local groups, and state and federal partners to restore access to historical habitat or improve access at partial barriers.
	Research	High	On-going	Increase understanding of fish passage efficiency in different fish passage designs including pool and weir, nature-like, Denil, and Alaskan steeppass
				Continue collecting biological samples to understand how age distribution, length at age, and repeat spawning ratios differ between long-term, recently restored, and rebuilding runs
		Moderate	New	Monitor multiple life stages of river herring to understand which stages may be experiencing high mortality
	Survey and Monitoring	Moderate	On-going	Update current and historical habitat maps representing spawning locations for alewife and blueback herring.
Green Sea Urchin, Strongylocentrotus droebachiensis	Public Outreach	High	New	Design and encourage the use of more size-selective fishing gear
	Research	High	New	Conduct research to support stock assessment and population dynamics modeling
				Determine the relative roles of natural predation, fishing mortality, and climate change in stock dynamics
				Assess the feasibility and advantages of local or area species management approaches
		Moderate	New	Determine the feasibility of reseeding programs

	Species Management	High	On-going	Support community engagement in developing a fisheries management plan
	Survey and Monitoring	Critical	On-going	Monitor stock status through surveys and sampling programs
Harbor Porpoise, Phocoena phocoena	Public Outreach	Moderate	On-going	Continue to work with the fishing industry to develop gear modifications that reduce the risk of entanglement and conduct outreach on gear best practices to use
				Conduct outreach on gear best practices to use
Horseshoe Crab, Limulus polyphemus	Habitat Management	High	On-going	Purchase or protect undeveloped shoreline and adjacent areas that is known or potential habitat for horseshoe crab
	Public Outreach	High	On-going	Encourage use of selective fishing gear that minimizes bycatch and impacts to habitat.
	Research	Critical	On-going	Identify areas where degraded water quality my adversely impact horseshoe crabs
		High	On-going	Promote research to fill data gaps and inform managers
	Survey and Monitoring	High	New	Conduct surveys to monitor and better understand distribution and abundance
Northern Shrimp, Pandalus borealis	Public Outreach	High	New	Design and encourage the use of more size-selective fishing gear
	Research	High	New	Conduct research to support stock assessment and population dynamics modeling
				Determine the relative roles of natural predation, fishing mortality, and climate change in stock dynamics
	Survey and Monitoring	Critical	On-going	Monitor stock status through surveys and sampling programs
Orange-footed Sea Cucumber, Cucumaria frondosa	Public Outreach	High	New	Design and encourage the use of more size-selective fishing gear
	Research	High	New	Conduct research to support management, including stock assessments, e.g. development of predation, reproduction, growth and aging data and habitat mapping
		Moderate	New	Assess the feasibility and advantages of local or area species management approaches
	Species Management	Moderate	New	Support community engagement in developing a fisheries management plan
	Survey and Monitoring	High	New	Monitor stock status through surveys and sampling programs
Porbeagle, Lamna nasus	Research	Critical	New	Determine the location and timing of important habitat use at different life history stages

				Identify methods to reduce incidental bycatch by recreational anglers Develop an improved understanding of discard mortality rates
Rainbow smelt, Osmerus mordax	Research	High	New	Developing a mark-recapture study to estimate the current extraction rate of recreational ice fishing on the Kennebec River and Merrymeeting Bay and other rivers and embayments that support recreational ice fishing
			On-going	Assessing threats to smelt habitat and evaluating connections between degraded habitat and local smelt population decline
	Species Management	Critical	On-going	Restoring stream connectivity and access to historical spawning grounds with monitoring to assess pre- and post-construction conditions and smelt populations
		Moderate	On-going	Stocking rainbow smelt larvae marked with oxytetracycline into historical smelt spawning streams that maintain good habitat, while maintaining the genetic structure as identified by this project and annually monitoring stocking success.
	Survey and Monitoring	High	On-going	Continuing monitoring of smelt populations through fyke net sampling, creel surveys, the inshore trawl survey, and the juvenile abundance survey
Shortfin Mako, Isurus oxyrinchus	Research	High	New	Determine the location and timing of important habitat use at different life history stages
				Identify methods to reduce incidental bycatch by recreational anglers
				Develop an improved understanding of discard mortality rates
Shortnose sturgeon, Acipenser brevirostrum	Research	High	On-going	Characterize intersystem movements of shortnose and Atlantic sturgeon (e.g., which systems used, paths taken, timing and duration of movements).
		Moderate	On-going	Determine feeding habitat and trophic position of shortnose and Atlantic sturgeon in each system
				Investigate possibility of shortnose and Atlantic sturgeon scute elemental analysis as indicator of river of origin
	Species Management	High	New	Estimate current population size of shortnose and Atlantic sturgeon in major river systems in Maine.
			On-going	Determine sex and stage of maturity of shortnose and Atlantic sturgeon
Smooth Skate, Malacoraja senta	Research	Critical	New	Develop an improved understanding of discard mortality rates
				Determine the location and timing of important habitat use at different life history stages
Thorny Skate, Amblyraja radiata	Research	Critical	New	Develop an improved understanding of discard mortality rates
				Determine the location and timing of important habitat use at different life history stages

				Update life history data across species range
Winter Flounder, Pseudopleuronectes americanus	Research	Moderate	New	Identify areas were winter flounder spawn
			On-going	Conduct research regarding winter flounder habitat needs for various life stages and determine the importance of unique habitat systems such as eelgrass on survivability
	Survey and Monitoring	Moderate	On-going	Monitor water quality at winter flounder habitats to determine effect of changing water quality on winter flounder biology and survivability (e.g. temperature and sex ratio relationships).
Winter Skate, Leucoraja ocellata	Research	High	New	Update life history data across species range

Table 6-6: 2015 Maine Wildlife Action Plan Habitat Conservation Actions. Actions are sorted by Habitat Workgroup (FW=freshwater, M=marine, TW=terrestrial/freshwater wetlands), Habitat Group, Action Category, then by Biological Priority (C=critical, H=high, M=moderate). *Stressor names are from Level 2 of the IUCN Threat Classification Scheme; these are broad categories that may not capture all the nuances of stressor-SGCN-habitat interactions, including beneficial effects. Readers are urged to refer to species and habitat reports for more details on interactions among stressors, habitats, and SGCN.

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
FW	81	Headwaters and Creeks	Policy	C	on-going	Encourage enforcement of existing riparian protection laws and rules	F4			Logging & Wood Harvesting
FW	82	Headwaters and Creeks	Public Outreach	H	new	Encourage improved road maintenance to reduce road gravel input and other pollutants into streams	F5			Logging & Wood Harvesting
FW	83	Headwaters and Creeks	Public Outreach	H	new	Develop best management practices for riparian management in forest lands	F4			Logging & Wood Harvesting
FW	84	Headwaters and Creeks	Public Outreach	H	on-going	Provide outreach and education to forest landowners on the value of maintaining >60% tree cover in watersheds with high value SGCN habitats	F4			Logging & Wood Harvesting
FW	85	Headwaters and Creeks	Public Outreach	H	on-going	Encourage wood addition as a management objective for riparian areas	F4			Logging & Wood Harvesting
FW	86	Headwaters and Creeks	Research	H	new	Determine whether existing protections provide adequate riparian protection to headwaters and creeks	F4			Logging & Wood Harvesting
FW	87	Headwaters and Creeks	Survey & Monit.	M	new	Identify high value native Coldwater SGCN fish and other SGCN species habitats that may be vulnerable to watershed scale hydrology effects due to tree loss	F4	F3		Logging & Wood Harvesting

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
FW	121	Streams, Rivers, Lakes, and Ponds	Habitat Mgmt.	H	new	Identify and protect Coldwater resilient areas and waterbodies that are not amenable to the spread of invasive species	F2	F3		Invasive Non-native/Alien Species/Diseases
FW	130	Streams, Rivers, Lakes, and Ponds	Habitat Mgmt.	H	on-going	Explore options to encourage the addition of woody material to streams and lakes	F4			Logging & Wood Harvesting
FW	131	Streams, Rivers, Lakes, and Ponds	Habitat Mgmt.	H	on-going	Construct crossings to pass storm flows and ensure enduring aquatic SGCN organism passage	F1			Roads & Railroads
FW	104	Streams, Rivers, Lakes, and Ponds	Habitat Mgmt.	M	new	Encourage installation of constructed wetlands to buffer waterways from wastewater contamination	F5			Domestic & Urban Waste Water
FW	122	Streams, Rivers, Lakes, and Ponds	Habitat Mgmt.	M	new	Use habitat modifications to reduce the vulnerability of habitats to species invasions, such as returning impoundments to free-flowing river conditions	F2			Invasive Non-native/Alien Species/Diseases
FW	123	Streams, Rivers, Lakes, and Ponds	Habitat Mgmt.	M	on-going	Remove dams to reduce impoundments to improve habitat conditions for SGCN	F2	F6		Invasive Non-native/Alien Species/Diseases
FW	88	Streams, Rivers, Lakes, and Ponds	Policy	C	new	Develop a process to expedite dam removal and reduce the Federal regulatory burden, particularly for small, dilapidated dams	F6			Dams & Water Management/Use
FW	105	Streams, Rivers, Lakes, and Ponds	Policy	C	new	Provide incentives for landowners to maintain riparian buffers	F4			Domestic & Urban Waste Water
FW	118	Streams, Rivers, Lakes, and Ponds	Policy	C	new	Require septic inspections when a house sells to ensure that it is functioning properly	F5			Domestic & Urban Waste Water

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
FW	124	Streams, Rivers, Lakes, and Ponds	Policy	C	on-going	Improve enforcement of existing laws related to the transport of invasive species by boats, anglers, and through the pet trade	F2			Invasive Non-native/Alien Species/Diseases
FW	125	Streams, Rivers, Lakes, and Ponds	Policy	C	on-going	Expand targeted inspections of boats and the pet trade in order to reduce the spread of invasives and raise awareness	F2			Invasive Non-native/Alien Species/Diseases
FW	135	Streams, Rivers, Lakes, and Ponds	Policy	C	on-going	Continue bond funding for municipalities to implement road stream crossing improvements	F1			Roads & Railroads
FW	89	Streams, Rivers, Lakes, and Ponds	Policy	H	new	Develop a dam registry to ensure that dams are identified and mapped	F6	F3		Dams & Water Management/Use
FW	90	Streams, Rivers, Lakes, and Ponds	Policy	H	new	Develop incentives to encourage landowners to remove dams	F6			Dams & Water Management/Use
FW	91	Streams, Rivers, Lakes, and Ponds	Policy	H	new	Identify funding to construct passage structures at dams	F6			Dams & Water Management/Use
FW	92	Streams, Rivers, Lakes, and Ponds	Policy	H	new	Identify and bring awareness to practitioners on technologies that have failed to promote fish passage	F6			Dams & Water Management/Use
FW	93	Streams, Rivers, Lakes, and Ponds	Policy	H	new	Develop monitoring standards for SGCN fish passage efficiency	F6			Dams & Water Management/Use
FW	97	Streams, Rivers, Lakes, and Ponds	Policy	H	new	Apply state Streamflow standards to dams	F6			Dams & Water Management/Use

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
FW	98	Streams, Rivers, Lakes, and Ponds	Policy	H	new	Develop Safety Standards for dams and corresponding enforcement, in order to reduce the number of unmaintained dams by encouraging removal	F6			Dams & Water Management/Use
FW	106	Streams, Rivers, Lakes, and Ponds	Policy	H	new	Develop incentives to encourage homeowners near lake/river shores to replace their old septic systems	F5			Domestic & Urban Waste Water
FW	126	Streams, Rivers, Lakes, and Ponds	Policy	H	on-going	Improve fishing regulations related to the undesirable transfer of invasive species	F2			Invasive Non-native/Alien Species/Diseases
FW	132	Streams, Rivers, Lakes, and Ponds	Policy	H	new	Develop standards for new/replacement road stream crossings	F1			Roads & Railroads
FW	133	Streams, Rivers, Lakes, and Ponds	Policy	H	new	Develop a state road stream crossing restoration program with dedicated staff	F1			Roads & Railroads
FW	134	Streams, Rivers, Lakes, and Ponds	Policy	H	new	Streamline permitting process for road crossing upgrades	F1			Roads & Railroads
FW	136	Streams, Rivers, Lakes, and Ponds	Policy	H	on-going	Conduct statewide/watershed scale connectivity planning	F1			Roads & Railroads
FW	137	Streams, Rivers, Lakes, and Ponds	Policy	H	on-going	Enhance coordination of agencies and NGOs to facilitate road stream crossing improvements	F1			Roads & Railroads
FW	108	Streams, Rivers, Lakes, and Ponds	Policy	M	new	Increase penalties for infractions of current laws relating to riparian buffers near residential development	F4	F5		Domestic & Urban Waste Water

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
FW	109	Streams, Rivers, Lakes, and Ponds	Policy	M	new	Develop incentives to encourage municipalities to increase the capacity of their treatment facilities	F5			Domestic & Urban Waste Water
FW	117	Streams, Rivers, Lakes, and Ponds	Public Outreach	C	on-going	Work with municipalities, code enforcement officers, etc. to improve the enforcement of current laws that require riparian buffers to reduce impacts of wastewater on aquatic habitats	F4			Domestic & Urban Waste Water
FW	139	Streams, Rivers, Lakes, and Ponds	Public Outreach	C	on-going	Continue Stream Smart general and technical training	F1			Roads & Railroads
FW	46	Streams, Rivers, Lakes, and Ponds	Public Outreach	H	new	Provide outreach and education to horticulturalists and landscape architects on the importance of maintaining riparian vegetation during the course of their work	F4			Domestic & Urban Waste Water
FW	47	Streams, Rivers, Lakes, and Ponds	Public Outreach	H	new	Provide outreach and education to town planning boards on the importance of maintaining riparian vegetation to prevent declines in water quality	F4			Domestic & Urban Waste Water
FW	94	Streams, Rivers, Lakes, and Ponds	Public Outreach	H	new	Provide outreach and education to dam owners and the public about the benefits of removing dams in some circumstances	F6			Dams & Water Management/Use
FW	95	Streams, Rivers, Lakes, and Ponds	Public Outreach	H	new	Provide outreach and education to dam operators on ways to facilitate SGCN fish passage at dams	F6			Dams & Water Management/Use
FW	112	Streams, Rivers, Lakes, and Ponds	Public Outreach	H	new	Provide outreach and education to residents living on lake or river shores on the importance of maintaining riparian buffers, including options that allow water views (i.e. unmowed grass, shrubs)	F4			Domestic & Urban Waste Water
FW	113	Streams, Rivers, Lakes, and Ponds	Public Outreach	H	new	Provide outreach and education to code enforcement officers and town planners on current regulations related to wastewater discharge	F5			Domestic & Urban Waste Water

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
FW	114	Streams, Rivers, Lakes, and Ponds	Public Outreach	H	new	Work with municipalities to increase treatment capacity of wastewater facilities to reduce wastewater impacts to aquatic habitats	F5			Domestic & Urban Waste Water
FW	138	Streams, Rivers, Lakes, and Ponds	Public Outreach	H	new	Provide online tools to prioritize road crossing upgrades	F1	F3		Roads & Railroads
FW	140	Streams, Rivers, Lakes, and Ponds	Public Outreach	H	on-going	Encourage the use of temporary and permanent bridges rather than culverts	F1			Roads & Railroads
FW	141	Streams, Rivers, Lakes, and Ponds	Public Outreach	H	on-going	Encourage information exchange forums such as Fisheries Improvement Network (FIN) and Small Woodlot Owners Association of Maine (SWOAM)	F1			Roads & Railroads
FW	142	Streams, Rivers, Lakes, and Ponds	Public Outreach	H	on-going	Encourage alternative road routes that do not interfere with streams or riparian areas	F1	F3		Roads & Railroads
FW	143	Streams, Rivers, Lakes, and Ponds	Public Outreach	H	on-going	Continue advanced aquatic SGCN organism passage training	F1			Roads & Railroads
FW	96	Streams, Rivers, Lakes, and Ponds	Public Outreach	M	on-going	Train new and existing engineers on proper ways to design fish passage structures through universities and training programs	F6			Dams & Water Management/Use
FW	115	Streams, Rivers, Lakes, and Ponds	Public Outreach	M	new	Develop best management practices for development near waterways	F4	F5		Domestic & Urban Waste Water
FW	116	Streams, Rivers, Lakes, and Ponds	Public Outreach	M	new	Decrease the amount of input into wastewater treatment facilities (e.g., treat storm water differently than sewage where appropriate)	F5			Domestic & Urban Waste Water

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
FW	99	Streams, Rivers, Lakes, and Ponds	Research	H	on-going	Investigate alternative technologies to promote passage of aquatic organisms	F6			Dams & Water Management/Use
FW	100	Streams, Rivers, Lakes, and Ponds	Research	H	on-going	Research fish behavior and movement to identify ways to improve the design of fish passage structures	F6			Dams & Water Management/Use
FW	119	Streams, Rivers, Lakes, and Ponds	Research	H	new	Conduct research to determine the adequacy of current laws in maintaining effective riparian buffers near residential development	F4			Domestic & Urban Waste Water
FW	120	Streams, Rivers, Lakes, and Ponds	Research	H	new	Solicit help from experts in septic system design to determine solutions to septic seepage into waterways	F5			Domestic & Urban Waste Water
FW	127	Streams, Rivers, Lakes, and Ponds	Research	H	on-going	Conduct research on the economic impact of invasive species, mitigation strategies, and containment strategies in aquatic ecosystems	F2			Invasive Non-native/Alien Species/Diseases
FW	144	Streams, Rivers, Lakes, and Ponds	Research	M	on-going	Increase understanding of climate change/infrastructure threats to freshwater aquatic ecosystems	F1			Roads & Railroads
FW	128	Streams, Rivers, Lakes, and Ponds	Species Mgmt.	H	on-going	Expand efforts to suppress and control invasive species, including through reclamation of water bodies	F2			Invasive Non-native/Alien Species/Diseases
FW	129	Streams, Rivers, Lakes, and Ponds	Species Mgmt.	M	on-going	Promote native species abundance in aquatic SGCN habitats in order to foster competition that may reduce or slow the spread of invasives	F2			Invasive Non-native/Alien Species/Diseases
FW	101	Streams, Rivers, Lakes, and Ponds	Survey & Monit.	H	new	Conduct a statewide inventory of dams, including on headwater streams	F6			Dams & Water Management/Use

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
FW	102	Streams, Rivers, Lakes, and Ponds	Survey & Monit.	H	new	Identify priority locations for ecological flow management in aquatic habitats	F6	F3		Dams & Water Management/Use
FW	145	Streams, Rivers, Lakes, and Ponds	Survey & Monit.	H	on-going	Increase habitat surveys and models for road stream crossings	F1	F3		Roads & Railroads
FW	146	Streams, Rivers, Lakes, and Ponds	Survey & Monit.	H	on-going	Complete a statewide inventory of the status and condition of road and railroad crossings, including on headwater streams	F1	F3		Roads & Railroads
FW	103	Streams, Rivers, Lakes, and Ponds	Survey & Monit.	M	new	Develop better methods to map potential barriers in priority watersheds	F1	F6	F3	Dams & Water Management/Use
FW	147	Streams, Rivers, Lakes, and Ponds	Survey & Monit.	M	on-going	Track completed road stream crossing projects	F1			Roads & Railroads
M	169	Coastal	Habitat Mgmt.	C	on-going	Implement agency recommendations that mitigate impacts of development on coastal and rocky coast SGCN habitats through permit review process	M10			Commercial & Industrial Areas , Housing & Urban Areas, Other Ecosystem Modifications, Roads & Railroads, Tourism & Recreational Areas
M	170	Coastal	Habitat Mgmt.	C	on-going	Develop and implement best management practices or beach management agreements with municipalities and beach managers	M10	M5		Commercial & Industrial Areas , Housing & Urban Areas, Other Ecosystem Modifications, Roads & Railroads, Tourism & Recreational Areas
M	171	Coastal	Habitat Mgmt.	C	on-going	Implement predator control programs near SGCN nesting areas in coastal and rocky coast habitats	M8			Commercial & Industrial Areas , Housing & Urban Areas, Other Ecosystem Modifications, Roads & Railroads, Tourism & Recreational Areas
M	172	Coastal	Habitat Mgmt.	C	on-going	Develop and implement best management practices or beach management agreements with municipalities and beach managers	M10			Recreational Activities

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
M	168	Coastal	Habitat Mgmt.	H	on-going	Use voluntary agreements, conservation easements, tax abatements and incentives, and acquisition to conserve important coastal and rocky coast SGCN habitats	M10			Commercial & Industrial Areas , Housing & Urban Areas, Other Ecosystem Modifications, Roads & Railroads, Tourism & Recreational Areas
M	174	Coastal	Habitat Mgmt.	M	on-going	Protect upland areas through acquisition, easements, and municipal planning that will allow coastal habitats to migrate inland as sea level rise occurs	M5	M3M4		Habitat Shifting or Alteration, Storms & Flooding, Temperature Extremes
M	173	Coastal	Public Outreach	C	on-going	Provide outreach to recreationalists regarding effects of human disturbance on beach nesting birds and roosting/feeding shorebirds	M8	M10		Recreational Activities
M	175	Coastal	Research	M	new	Research and identify management actions that may minimize impacts to coastal SGCN habitats from climate change	M3 M4			Storms & Flooding, Temperature Extremes, Habitat Shifting or Alteration
M	167	Coastal	Survey & Monit.	H	on-going	Work with municipalities to identify important SGCN nesting and migratory areas in rocky coast and coastal habitats during comprehensive planning with assistance from programs such as Beginning with Habitat	M1			Commercial & Industrial Areas , Housing & Urban Areas, Other Ecosystem Modifications, Roads & Railroads, Tourism & Recreational Areas
M	221	Intertidal	Habitat Mgmt.	C	on-going	Encourage partnership projects among transportation agencies, utility companies, etc. to facilitate fish passage and maintain connectivity in or near subtidal, intertidal, and tidal marsh habitats especially in cases where structures have different purposes for different users	M5			Dams & Water Management/Use, Roads & Railroads, Shipping Lanes, Utility & Service Lines
M	257	Intertidal	Habitat Mgmt.	C	on-going	Decommission remnant or unused roads and dams in or near tidal marsh, intertidal, and subtidal habitats	M5			Dams & Water Management/Use, Roads & Railroads, Shipping Lanes, Utility & Service Lines
M	262	Intertidal	Habitat Mgmt.	C	new	Use transportation bonds to provide funding for culvert replacement in or near intertidal, subtidal, and tidal marsh habitats using best management practices	M5			Dams & Water Management/Use, Roads & Railroads, Shipping Lanes, Utility & Service Lines
M	209	Intertidal	Habitat Mgmt.	H	on-going	Promote voluntary baywide (or scale of ecological relevance) coordination of shared resources and education addressing the impacts of fishing and harvesting aquatic resources on SGCN intertidal and subtidal habitats	M9			Fishing & Harvesting of Aquatic Resources

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
M	225	Intertidal	Habitat Mgmt.	H	on-going	Restore and conserve land (e.g., dunes, stream buffers) and improve conservation management at state and municipal levels to reduce impacts of effluents and wastewater on intertidal and subtidal SGCN habitats	M3 M4			Agricultural & Forestry Effluents, Domestic & Urban Waste Water, Industrial & Military Effluents
M	237	Intertidal	Habitat Mgmt.	H	on-going	Assess new aquaculture sites for potential positive, benign, or negative species interactions with the surrounding habitat and ecological systems	M1	M10		Marine & Freshwater Aquaculture
M	243	Intertidal	Habitat Mgmt.	H	on-going	Increase riparian and coastal buffer zones by limiting development in these areas to minimize damage to these properties due to flooding/waves and to maintain pervious surfaces for improved water management	M3 M4			Habitat Shifting or Alteration, Storms & Flooding, Temperature Extremes
M	249	Intertidal	Habitat Mgmt.	H	on-going	Mitigate coastal acidification of intertidal and subtidal habitats using strategies similar to those for reducing effects of effluents/wastewater	M2			Habitat Shifting or Alteration, Storms & Flooding, Temperature Extremes
M	253	Intertidal	Habitat Mgmt.	H	on-going	Purchase undeveloped shoreline and adjacent areas for publically-owned parks, conservation areas, or marsh migration corridors	M3 M4			Commercial & Industrial Areas , Housing & Urban Areas, Livestock Farming & Ranching
M	261	Intertidal	Habitat Mgmt.	H	on-going	Using technology to reduce discharge of wastewater and effluents into intertidal and subtidal SGCN habitats	M2			Agricultural & Forestry Effluents, Domestic & Urban Waste Water, Industrial & Military Effluents
M	new	Intertidal	Habitat Mgmt.	H	on-going	Investigate the effects of commercial trawling within the intertidal zone.	M2	M9	M10	Fishing & Harvesting of Aquatic Resources
M	207	Intertidal	Habitat Mgmt.	M	new	Alter shipping lanes and dredging plans in intertidal and subtidal habitats to minimize biological and ecological impacts to SGCN	M1	M10		Agricultural & Forestry Effluents, Domestic & Urban Waste Water, Industrial & Military Effluents
M	216	Intertidal	Habitat Mgmt.	M	on-going	Develop coastal focus areas encompassing marine habitats with high concentrations of SGCN using improved species occurrence maps	M1			Lack of knowledge

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
M	219	Intertidal	Habitat Mgmt.	M	on-going	Conduct law enforcement training and workshops to support knowledge of SGCN and how existing regulations affect SGCN and their habitats	M6			Recreational Activities, Fishing & Harvesting
M	236	Intertidal	Habitat Mgmt.	M	on-going	Improve response plans for industrial spills (e.g., oil spills) in intertidal and subtidal habitats and support research on oil dispersants and short and long term effect of oil spills	M2			Agricultural & Forestry Effluents, Domestic & Urban Waste Water, Industrial & Military Effluents
M	242	Intertidal	Habitat Mgmt.	M	new	Increase pH of mudflats (e.g., using harvested shell waste) to restore more favorable habitat conditions for intertidal and subtidal SGCN	M2			Fishing & Harvesting of Aquatic Resources
M	241	Intertidal	Policy	H	on-going	Increase enforcement of current laws and regulations regarding proper infrastructure (e.g., roads, dams, utility lines, shipping lanes) construction, maintenance, water quality, and fish passage in tidal marsh, intertidal, and subtidal SGCN habitats	M5	M6		Dams & Water Management/Use, Roads & Railroads, Shipping Lanes, Utility & Service Lines
M	245	Intertidal	Policy	H	on-going	Increase enforcement for dumping/litter/gear abandonment in intertidal and subtidal habitats	M6			Garbage & Solid Waste
M	252	Intertidal	Policy	H	new	Provide incentives for building Stream Smart structures and road crossings in or near intertidal, subtidal, and tidal marsh habitats that allow for changing environmental conditions such as sea level rise and increased flooding	M5			Dams & Water Management/Use, Roads & Railroads, Shipping Lanes, Utility & Service Lines
M	259	Intertidal	Policy	H	on-going	Strengthen invasive species regulations and enforcement in the shipping, transportation, and other industries to prevent introductions and spread of invasive species in intertidal and subtidal habitats	M6	M7		Invasive Non-native/Alien Species/Diseases, Problematic Native Species/Diseases, Viral/Prion-induced Diseases
M	223	Intertidal	Policy	M	on-going	Expand existing education and incentive programs for lawn care companies, homeowners, and municipalities to reduce wastewater and effluent inputs and effects on intertidal and subtidal SGCN habitats	M2			Agricultural & Forestry Effluents, Domestic & Urban Waste Water, Industrial & Military Effluents
M	224	Intertidal	Policy	M	new	Explore value of utilizing conservation leases to limit uses/stresses in intertidal and subtidal habitats	M9			Fishing & Harvesting of Aquatic Resources

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
M	234	Intertidal	Policy	M	on-going	Improve municipal planning and regulations for siting of new or retrofit developments (i.e., Smart Growth)to reduce wastewater and effluent effects on intertidal and subtidal SGCN habitats while also accounting for future environmental change	M3 M4			Agricultural & Forestry Effluents, Domestic & Urban Waste Water, Industrial & Military Effluents
M	239	Intertidal	Policy	M	on-going	Provide incentives for and education on using green infrastructure for preventing erosion and loss/damage of property near intertidal habitats	M2			Commercial & Industrial Areas , Housing & Urban Areas, Livestock Farming & Ranching
M	250	Intertidal	Policy	M	new	Update permit requirements for new and retrofitted developments in, near, or adjacent to intertidal habitats with up-to-date data/models of climate predictions	M3 M4			Commercial & Industrial Areas , Housing & Urban Areas, Livestock Farming & Ranching
M	256	Intertidal	Policy	M	on-going	Retrofit existing effluent and wastewater treatment infrastructure and plan for sea level rise by providing economic incentives and education	M3 M4			Agricultural & Forestry Effluents, Domestic & Urban Waste Water, Industrial & Military Effluents
M	258	Intertidal	Policy	M	on-going	Provide stewardship/conservation incentives to harvesters working in intertidal and subtidal SGCN habitats	M9			Fishing & Harvesting of Aquatic Resources
M	211	Intertidal	Public Outreach	H	on-going	Continue/expand litter reduction programs/public education in intertidal and subtidal habitats	M2			Garbage & Solid Waste
M	212	Intertidal	Public Outreach	H	on-going	Continue/expand marine debris recovery programs in intertidal and subtidal habitats and education to fishermen	M2			Garbage & Solid Waste
M	218	Intertidal	Public Outreach	H	on-going	Provide education and outreach through local meetings and trainings (e.g., Stream Smart) on techniques, problems and ecological effects of dams, roads, shipping lanes, and utility corridors on intertidal, subtidal, and tidal marsh habitats and publicize completed projects	M5	M3M4		Dams & Water Management/Use, Roads & Railroads, Shipping Lanes, Utility & Service Lines
M	231	Intertidal	Public Outreach	H	new	Improve knowledge of effects of renewable energy on intertidal and subtidal SGCN habitats and convey this information to the public	M2			Renewable Energy

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
M	240	Intertidal	Public Outreach	H	on-going	Increase outreach and education on preventing the spread of invasive/problematic species and diseases in intertidal, subtidal, and tidal marsh habitats	M7			Invasive Non-native/Alien Species/Diseases, Problematic Native Species/Diseases, Viral/Prion-induced Diseases
M	244	Intertidal	Public Outreach	H	on-going	Increase capacity for local engagement in data collection, surveys, and management of intertidal and subtidal SGCN and their habitats that fosters partnerships among harvesters, citizens, scientists, and managers	M9			Fishing & Harvesting of Aquatic Resources
M	246	Intertidal	Public Outreach	H	on-going	Increase leadership opportunities and education regarding climate change mitigation and adaptation in intertidal and subtidal habitats	M3 M4			Habitat Shifting or Alteration, Storms & Flooding, Temperature Extremes
M	208	Intertidal	Public Outreach	M	on-going	At popular sites, increase education and outreach on the effects of recreation on sensitive intertidal ecosystems, spread of invasive species, etc.	M1	M7		Recreational Activities
M	215	Intertidal	Public Outreach	M	new	Develop best management practices for maintaining energy facilities in intertidal and subtidal habitats	M2			Renewable Energy
M	222	Intertidal	Public Outreach	M	new	Expand existing education and research at the management level to improve understanding and management ability to reduce wastewater and effluent inputs and effects into intertidal and subtidal SGCN habitats	M2			Agricultural & Forestry Effluents, Domestic & Urban Waste Water, Industrial & Military Effluents
M	251	Intertidal	Public Outreach	M	on-going	Post signs describing specific usage constraints (e.g. avoid certain areas during breeding seasons, pick up dog waste, don't disturb flora and fauna) to minimize impacts of recreational activities on intertidal SGCN habitats	M8			Recreational Activities
M	260	Intertidal	Public Outreach	M	on-going	Promote use of more targeted fishing techniques in intertidal and subtidal habitats (e.g., bycatch reduction and not disturbing habitat) by encouraging discussions between harvesters, ecologists, and managers	M9			Fishing & Harvesting of Aquatic Resources
M	210	Intertidal	Research	C	new	Create a coastal acidification budget to determine which factors (i.e. point, non-point source pollution, atmospheric CO2, etc.) are most important in driving acidification nearshore in intertidal and subtidal habitats	M2			Habitat Shifting or Alteration, Storms & Flooding, Temperature Extremes

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
M	226	Intertidal	Research	C	new	Identify and conserve local intertidal and subtidal OA or SST refuges and resilient species	M3 M4			Habitat Shifting or Alteration, Storms & Flooding, Temperature Extremes
M	214	Intertidal	Research	H	on-going	Develop better understanding of climate change effects on intertidal and subtidal SGCN and ecosystem interactions	M3 M4			Lack of knowledge
M	220	Intertidal	Research	H	new	Encourage installation of lower cost SGCN-friendly infrastructure in and near subtidal, intertidal, and tidal marsh habitats through technology development and transfer of technology	M2			Dams & Water Management/Use, Roads & Railroads, Shipping Lanes, Utility & Service Lines
M	228	Intertidal	Research	H	on-going	Improve understanding of distribution, biology, and ecology of non-commercially harvested intertidal and subtidal SGCN	M1			Lack of knowledge
M	230	Intertidal	Research	H	on-going	Improve knowledge of intertidal and subtidal SGCN habitat use and migration patterns to better inform renewable energy project siting	M1	M10		Renewable Energy
M	233	Intertidal	Research	H	on-going	Improve modeling (at local and Gulf of Maine scales) of sea level rise effects on intertidal and subtidal SGCN habitats and incorporate into planning	M3 M4			Habitat Shifting or Alteration, Storms & Flooding, Temperature Extremes
M	235	Intertidal	Research	H	on-going	Improve mapping of intertidal and subtidal habitats and include information on SGCN movements and mortality due to turbines	M1	M10		Renewable Energy
M	255	Intertidal	Research	H	on-going	Research the feasibility of diversifying Maine's marine fisheries of SGCN in response to changing environmental variables	M3 M4			Habitat Shifting or Alteration, Storms & Flooding, Temperature Extremes
M	new	Intertidal	Research	H	on-going	Monitor coastal streams, rivers, and sediments for excessive nutrients and chemical therapeutants	M2			Agricultural & Forestry Effluents, Domestic & Urban Waste Water, Industrial & Military Effluents, Storms & Flooding

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
M	213	Intertidal	Research	M	on-going	Determine accuracy of commercial harvester- and dealer-reported landings and recreational fishing reports and surveys for target intertidal and subtidal SGCN and bycatch	M9			Fishing & Harvesting of Aquatic Resources
M	227	Intertidal	Research	M	on-going	Improve understanding of effects of energy development on bird and other SGCN use of migration corridors in intertidal and subtidal habitats	M1	M2		Renewable Energy
M	229	Intertidal	Research	M	on-going	Improve understanding of intertidal and subtidal SGCN distributions especially in regards to ecosystem interactions and predator prey relationships	M1			Lack of knowledge
M	238	Intertidal	Research	M	on-going	Continue to work with industry to minimize escape of aquaculture-raised individuals	M7			Marine & Freshwater Aquaculture
M	247	Intertidal	Research	M	on-going	Investigate the effects of various harvesting practices on intertidal and subtidal SGCN habitats and on trophic and ecological processes	M9			Fishing & Harvesting of Aquatic Resources
M	217	Intertidal	Survey & Monit.	H	on-going	Develop monitoring systems and rapid response plans to prevent the colonization of invasive/problematic species and diseases in intertidal, subtidal, and tidal marsh habitats	M7			Invasive Non-native/Alien Species/Diseases, Problematic Native Species/Diseases, Viral/Prion-induced Diseases
M	new	Intertidal	Survey & Monit.	H	on-going	Continued underwater surveillance of potential and active aquaculture lease sites with a focus on SGCN and important habitats	M2			Fishing & Harvesting of Aquatic Resources
M	248	Intertidal	Survey & Monit.	M	on-going	More frequently update intertidal and subtidal SGCN habitat maps and compare to historical maps to monitor changes in distribution over time	M1			Fishing & Harvesting of Aquatic Resources
M	161	Rocky Coast	Habitat Mgmt.	C	on-going	Implement predator control programs near SGCN nesting areas in coastal and rocky coast habitats	M8			Commercial & Industrial Areas , Housing & Urban Areas

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
M	152	Rocky Coast	Habitat Mgmt.	H	on-going	Minimize disturbances around rocky coast SGCN nesting and roosting habitat through voluntary agreements	M10	M8		Fishing & Harvesting of Aquatic Resources, Recreational Activities
M	153	Rocky Coast	Habitat Mgmt.	H	on-going	Limit disturbance of shorebird roosting areas and seabird nesting islands through signage, closure to foot traffic, and other effective means	M8			Fishing & Harvesting of Aquatic Resources, Recreational Activities
M	151	Rocky Coast	Habitat Mgmt.	M	on-going	Conserve areas around seabird nesting islands	M8			Recreational Activities
M	163	Rocky Coast	Habitat Mgmt.	M	on-going	Implement invasive species eradication programs where appropriate (e.g., not in areas where invasive plants provide cover for SGCN and reestablishment of native plants is unlikely), and encourage growth of native species	M7			Invasive Non-native/Alien Species/Diseases
M	164	Rocky Coast	Habitat Mgmt.	M	on-going	Identify conservation and restoration opportunities that allow for rocky coast habitat migration to higher elevations	M3 M4			Habitat Shifting or Alteration, Storms & Flooding
M	165	Rocky Coast	Habitat Mgmt.	M	on-going	Identify conservation and restoration opportunities at historic but currently unused nesting sites in rocky coast habitats	M1	M8		Habitat Shifting or Alteration, Storms & Flooding
M	166	Rocky Coast	Habitat Mgmt.	M	on-going	Deploy armoring structures at high value nesting areas along the rocky coast where migration of nesting habitat is not possible	M3 M4			Habitat Shifting or Alteration, Storms & Flooding
M	150	Rocky Coast	Policy	H	on-going	Seasonally close rocky coast SGCN nesting and roosting areas to foot traffic through conservation or management	M8			Recreational Activities
M	154	Rocky Coast	Policy	H	on-going	Increase enforcement of shipping activities, safe operational procedures, and spill clean-up and rehabilitation of oiled birds	M1	M6	M10	Industrial & Military Effluents, Shipping Lanes

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
M	155	Rocky Coast	Policy	H	new	Site shipping lanes away from important rocky coast SGCN nesting, migration or wintering areas	M10	M8	M1	Industrial & Military Effluents, Shipping Lanes
M	156	Rocky Coast	Policy	H	on-going	Enhance oil spill contingency planning and response efforts in rocky coast habitats including purchasing survey and hazing equipment	M10			Industrial & Military Effluents, Shipping Lanes
M	159	Rocky Coast	Policy	H	on-going	Use voluntary agreements, conservation easements, tax abatements and incentives, and acquisition to conserve important coastal and rocky coast SGCN habitats	M3 M4	M10	M8	Commercial & Industrial Areas , Housing & Urban Areas
M	160	Rocky Coast	Policy	H	on-going	Implement agency recommendations that mitigate impacts of development on coastal and rocky coast SGCN habitats through permit review process	M10			Commercial & Industrial Areas , Housing & Urban Areas
M	149	Rocky Coast	Public Outreach	H	on-going	Erect signage at important nesting and roosting areas in rocky coast habitats to discourage destructive effects of human recreation	M8			Recreational Activities
M	148	Rocky Coast	Public Outreach	M	on-going	Provide outreach to recreationalists regarding effects of human disturbance on nesting colonies and roosting shorebirds	M8			Recreational Activities
M	157	Rocky Coast	Survey & Monit.	H	on-going	Identify and prioritize significant nesting, migratory, and wintering areas in rocky coast habitats for contingency planning	M10			Industrial & Military Effluents, Shipping Lanes
M	158	Rocky Coast	Survey & Monit.	H	on-going	Work with municipalities to identify important SGCN nesting and migratory areas in rocky coast and coastal habitats during comprehensive planning with assistance from programs such as Beginning with Habitat	M10			Commercial & Industrial Areas , Housing & Urban Areas
M	162	Rocky Coast	Survey & Monit.	M	on-going	Identify invasive plant hot spots in rocky coast habitats	M7			Invasive Non-native/Alien Species/Diseases

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
M	107	Streams, Rivers, Lakes, and Ponds	Policy	H	new	Develop coastal focus areas encompassing marine habitats with high concentrations of SGCN using improved species occurrence maps	F5	F4		Lack of knowledge
M	279	Subtidal	Habitat Mgmt.	C	on-going	Encourage partnership projects among transportation agencies, utility companies, etc. to facilitate fish passage and maintain connectivity in or near subtidal, intertidal, and tidal marsh habitats especially in cases where structures have different purposes for different users	M5			Dams & Water Management/Use, Roads & Railroads, Shipping Lanes, Utility & Service Lines
M	314	Subtidal	Habitat Mgmt.	C	on-going	Decommission remnant or unused roads and dams in or near tidal marsh, intertidal, and subtidal habitats	M5			Dams & Water Management/Use, Roads & Railroads, Shipping Lanes, Utility & Service Lines
M	321	Subtidal	Habitat Mgmt.	C	new	Use transportation bonds to provide funding for culvert replacement in or near intertidal, subtidal, and tidal marsh habitats using best management practices	M5			Dams & Water Management/Use, Roads & Railroads, Shipping Lanes, Utility & Service Lines
M	264	Subtidal	Habitat Mgmt.	H	on-going	Promote voluntary baywide (or scale of ecological relevance) coordination of shared resources and education addressing the impacts of fishing and harvesting aquatic resources on SGCN intertidal and subtidal habitats	M9			Fishing & Harvesting of Aquatic Resources
M	285	Subtidal	Habitat Mgmt.	H	on-going	Restore and conserve land (e.g., dunes, stream buffers) and improve conservation management at state and municipal levels to reduce impacts of effluents and wastewater on intertidal and subtidal SGCN habitats	M3 M4			Agricultural & Forestry Effluents, Domestic & Urban Waste Water, Industrial & Military Effluents
M	297	Subtidal	Habitat Mgmt.	H	on-going	Assess new aquaculture sites for potential positive, benign, or negative species interactions with the surrounding habitat and ecological systems	M1	M10		Marine & Freshwater Aquaculture
M	308	Subtidal	Habitat Mgmt.	H	on-going	Mitigate coastal acidification of intertidal and subtidal habitats using strategies similar to those for reducing effects of effluents/wastewater	M2			Habitat Shifting or Alteration, Storms & Flooding, Temperature Extremes
M	309	Subtidal	Habitat Mgmt.	H	on-going	Model effects of sea level rise and other climate change factors on subtidal SGCN patterns including physiology, migration patterns, and trophic changes	M3 M4			Habitat Shifting or Alteration, Storms & Flooding, Temperature Extremes

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
M	320	Subtidal	Habitat Mgmt.	H	on-going	Using technology to reduce discharge of wastewater and effluents into intertidal and subtidal SGCN habitats	M2			Agricultural & Forestry Effluents, Domestic & Urban Waste Water, Industrial & Military Effluents
M	263	Subtidal	Habitat Mgmt.	M	new	Alter shipping lanes and dredging plans in intertidal and subtidal habitats to minimize biological and ecological impacts to SGCN	M1	M10		Agricultural & Forestry Effluents, Domestic & Urban Waste Water, Industrial & Military Effluents
M	272	Subtidal	Habitat Mgmt.	M	on-going	Develop coastal focus areas encompassing marine habitats with high concentrations of SGCN using improved species occurrence maps	M1			Lack of knowledge
M	277	Subtidal	Habitat Mgmt.	M	on-going	Conduct law enforcement training and workshops to support knowledge of SGCN and how existing regulations affect SGCN and their habitats	M6			Recreational Activities, Fishing & Harvesting
M	296	Subtidal	Habitat Mgmt.	M	on-going	Improve response plans for industrial spills (e.g., oil spills) in intertidal and subtidal habitats and support research on oil dispersants and short and long term effect of oil spills	M2			Agricultural & Forestry Effluents, Domestic & Urban Waste Water, Industrial & Military Effluents
M	300	Subtidal	Policy	H	on-going	Increase enforcement of current laws and regulations regarding proper infrastructure (e.g., roads, dams, utility lines, shipping lanes) construction, maintenance, water quality, and fish passage in tidal marsh, intertidal, and subtidal SGCN habitats	M5	M6		Dams & Water Management/Use, Roads & Railroads, Shipping Lanes, Utility & Service Lines
M	310	Subtidal	Policy	H	new	Provide incentives for building Stream Smart structures and road crossings in or near intertidal, subtidal, and tidal marsh habitats that allow for changing environmental conditions such as sea level rise and increased flooding	M5			Dams & Water Management/Use, Roads & Railroads, Shipping Lanes, Utility & Service Lines
M	317	Subtidal	Policy	H	on-going	Strengthen invasive species regulations and enforcement in the shipping, transportation, and other industries to prevent introductions and spread of invasive species in intertidal and subtidal habitats	M6	M7		Invasive Non-native/Alien Species/Diseases, Problematic Native Species/Diseases, Viral/Prion-induced Diseases
M	318	Subtidal	Policy	H	on-going	Time dredging projects in subtidal and tidal marsh habitats to minimize harm to SGCN based on migration and spawning cycles	M1	M10		Mining & Quarrying, Shipping Lanes

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
M	282	Subtidal	Policy	M	on-going	Expand existing education and incentive programs for lawn care companies, homeowners, and municipalities to reduce wastewater and effluent inputs and effects on intertidal and subtidal SGCN habitats	M2			Agricultural & Forestry Effluents, Domestic & Urban Waste Water, Industrial & Military Effluents
M	284	Subtidal	Policy	M	new	Explore value of utilizing conservation leases to limit uses/stresses in intertidal and subtidal habitats	M9			Fishing & Harvesting of Aquatic Resources
M	294	Subtidal	Policy	M	on-going	Improve municipal planning and regulations for siting of new or retrofit developments (i.e., Smart Growth)to reduce wastewater and effluent effects on intertidal and subtidal SGCN habitats while also accounting for future environmental change	M3 M4			Agricultural & Forestry Effluents, Domestic & Urban Waste Water, Industrial & Military Effluents
M	302	Subtidal	Policy	M	on-going	Increase enforcement for dumping/litter/gear abandonment in intertidal and subtidal habitats	M6			Garbage & Solid Waste
M	313	Subtidal	Policy	M	on-going	Retrofit existing effluent and wastewater treatment infrastructure and plan for sea level rise by providing economic incentives and education	M3 M4			Agricultural & Forestry Effluents, Domestic & Urban Waste Water, Industrial & Military Effluents
M	315	Subtidal	Policy	M	on-going	Site shipping lanes and dredging projects to minimize negative impacts to intertidal and subtidal SGCN and their habitats	M1	M10		Mining & Quarrying, Shipping Lanes
M	316	Subtidal	Policy	M	on-going	Provide stewardship/conservation incentives to harvesters working in intertidal and subtidal SGCN habitats	M9			Fishing & Harvesting of Aquatic Resources
M	267	Subtidal	Public Outreach	C	on-going	Continue/expand litter reduction programs/public education in intertidal and subtidal habitats	M2			Garbage & Solid Waste
M	268	Subtidal	Public Outreach	H	on-going	Continue/expand marine debris recovery programs in intertidal and subtidal habitats and education to fishermen	M2			Garbage & Solid Waste

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
M	275	Subtidal	Public Outreach	H	on-going	Provide education and outreach through local meetings and trainings (e.g., Stream Smart) on techniques, problems and ecological effects of dams, roads, shipping lanes, and utility corridors on intertidal, subtidal, and tidal marsh habitats and publicize completed projects	M5	M3M4		Dams & Water Management/Use, Roads & Railroads, Shipping Lanes, Utility & Service Lines
M	291	Subtidal	Public Outreach	H	new	Improve knowledge of effects of renewable energy on intertidal and subtidal SGCN habitats and convey this information to the public	M2			Renewable Energy
M	299	Subtidal	Public Outreach	H	on-going	Increase outreach and education on preventing the spread of invasive/problematic species and diseases in intertidal, subtidal, and tidal marsh habitats	M7			Invasive Non-native/Alien Species/Diseases, Problematic Native Species/Diseases, Viral/Prion-induced Diseases
M	303	Subtidal	Public Outreach	H	on-going	Increase leadership opportunities and education regarding climate change mitigation and adaptation in intertidal and subtidal habitats	M3 M4			Habitat Shifting or Alteration, Storms & Flooding, Temperature Extremes
M	304	Subtidal	Public Outreach	H	on-going	Increase capacity for local engagement in data collection, surveys, and management of intertidal and subtidal SGCN and their habitats that fosters partnerships among harvesters, citizens, scientists, and managers	M9			Fishing & Harvesting of Aquatic Resources
M	271	Subtidal	Public Outreach	M	new	Develop best management practices for maintaining energy facilities in intertidal and subtidal habitats	M2			Renewable Energy
M	274	Subtidal	Public Outreach	M	on-going	Continue partnerships between anglers, guides, scientists, and managers to collect biological information and catch data to use in population assessments and identifying species habitat use and behavior	M9			Recreational Activities
M	276	Subtidal	Public Outreach	M	on-going	Provide outreach and education to recreational marine harvesters on proper catch and release methods to minimize trauma (including barotrauma)	M9			Recreational Activities
M	280	Subtidal	Public Outreach	M	on-going	Continue to work with recreational marine charter captains to collect accurate data that can be used to assess SGCN populations	M9			Recreational Activities

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
M	281	Subtidal	Public Outreach	M	new	Expand existing education and research at the management level to improve understanding and management ability to reduce wastewater and effluent inputs and effects into intertidal and subtidal SGCN habitats	M2			Agricultural & Forestry Effluents, Domestic & Urban Waste Water, Industrial & Military Effluents
M	319	Subtidal	Public Outreach	M	on-going	Promote use of more targeted fishing techniques in intertidal and subtidal habitats (e.g., bycatch reduction and not disturbing habitat) by encouraging discussions between harvesters, ecologists, and managers	M9			Fishing & Harvesting of Aquatic Resources
M	265	Subtidal	Research	C	new	Create a coastal acidification budget to determine which factors (i.e. point, non-point source pollution, atmospheric CO2, etc.) are most important in driving acidification nearshore in intertidal and subtidal habitats	M2			Habitat Shifting or Alteration, Storms & Flooding, Temperature Extremes
M	286	Subtidal	Research	C	new	Identify and conserve local intertidal and subtidal OA or SST refuges and resilient species	M3 M4			Habitat Shifting or Alteration, Storms & Flooding, Temperature Extremes
M	295	Subtidal	Research	C	on-going	Improve mapping of intertidal and subtidal habitats and include information on SGCN movements and mortality due to turbines	M1	M10		Renewable Energy
M	305	Subtidal	Research	C	new	Investigate offshore changes in circulation patterns, plankton distribution and abundance, and other bio-chemical and physical processes	M2			Habitat Shifting or Alteration, Storms & Flooding, Temperature Extremes
M	270	Subtidal	Research	H	on-going	Develop better understanding of climate change effects on intertidal and subtidal SGCN and ecosystem interactions	M3 M4			Lack of knowledge
M	278	Subtidal	Research	H	new	Encourage installation of lower cost SGCN-friendly infrastructure in and near subtidal, intertidal, and tidal marsh habitats through technology development and transfer of technology	M2			Dams & Water Management/Use, Roads & Railroads, Shipping Lanes, Utility & Service Lines
M	289	Subtidal	Research	H	on-going	Improve understanding of distribution, biology, and ecology of non-commercially harvested intertidal and subtidal SGCN	M1			Lack of knowledge

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
M	290	Subtidal	Research	H	on-going	Improve knowledge of intertidal and subtidal SGCN habitat use and migration patterns to better inform renewable energy project siting	M3 M4			Renewable Energy
M	293	Subtidal	Research	H	on-going	Improve modeling (at local and Gulf of Maine scales) of sea level rise effects on intertidal and subtidal SGCN habitats and incorporate into planning	M3 M4			Habitat Shifting or Alteration, Storms & Flooding, Temperature Extremes
M	312	Subtidal	Research	H	on-going	Research the feasibility of diversifying Maine's marine fisheries of SGCN in response to changing environmental variables	M3 M4			Habitat Shifting or Alteration, Storms & Flooding, Temperature Extremes
M	269	Subtidal	Research	M	on-going	Determine accuracy of commercial harvester- and dealer-reported landings and recreational fishing reports and surveys for target intertidal and subtidal SGCN and bycatch	M9			Fishing & Harvesting of Aquatic Resources
M	287	Subtidal	Research	M	on-going	Improve understanding of intertidal and subtidal SGCN distributions especially in regards to ecosystem interactions and predator prey relationships	M1			Lack of knowledge
M	288	Subtidal	Research	M	on-going	Improve understanding of effects of energy development on bird and other SGCN use of migration corridors in intertidal and subtidal habitats	M1	M2		Renewable Energy
M	298	Subtidal	Research	M	on-going	Continue to work with industry to minimize escape of aquaculture-raised individuals	M7			Marine & Freshwater Aquaculture
M	301	Subtidal	Research	M	new	Expand research and pilot studies to test the efficacy of increasing pH of mudflats (e.g., using harvested shell waste) to restore more favorable habitat conditions for intertidal and subtidal SGCN	M2			Fishing & Harvesting of Aquatic Resources
M	306	Subtidal	Research	M	on-going	Investigate the effects of various harvesting practices on intertidal and subtidal SGCN habitats and on trophic and ecological processes	M9			Fishing & Harvesting of Aquatic Resources

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
M	273	Subtidal	Survey & Monit.	H	on-going	Develop monitoring systems and rapid response plans to prevent the colonization of invasive/problematic species and diseases in intertidal, subtidal, and tidal marsh habitats	M7			Invasive Non-native/Alien Species/Diseases, Problematic Native Species/Diseases, Viral/Prion-induced Diseases
M	new	Subtidal	Survey & Monit.	H	on-going	Continued underwater surveillance of potential and active aquaculture lease sites with a focus on SGCN and important habitats	M2			Fishing & Harvesting of Aquatic Resources
M	266	Subtidal	Survey & Monit.	M	on-going	Continue to improve rapid response for oil and gas spills in intertidal and subtidal habitats, including state agencies efforts to have most up-to-date species maps, rapid response protocols in place, and regular scenario training	M1	M10		Mining & Quarrying, Shipping Lanes
M	283	Subtidal	Survey & Monit.	M	on-going	Expand surveys of recreational fishing efforts to include SGCN that are not targeted in current survey efforts	M9			Recreational Activities
M	307	Subtidal	Survey & Monit.	M	on-going	More frequently update intertidal and subtidal SGCN habitat maps and compare to historical maps to monitor changes in distribution over time	M1			Fishing & Harvesting of Aquatic Resources
M	180	Tidal Marsh	Habitat Mgmt.	C	on-going	Work with land conservation organizations and private landowners to secure permanent protection of tidal marshes, adjacent uplands, and marsh migration corridors	M3 M4			Annual & Perennial Non-timber crops, Commercial & Industrial Areas , Housing & Urban Areas, Livestock Farming & Ranching, Utility & Service Lines
M	183	Tidal Marsh	Habitat Mgmt.	C	on-going	Conserve lands that are upland and inland of marshes to allow for marsh migration and maintain habitat connectivity	M3 M4			Habitat Shifting or Alteration
M	194	Tidal Marsh	Habitat Mgmt.	C	new	Use transportation bonds to provide funding for culvert replacement in or near intertidal, subtidal, and tidal marsh habitats using best management practices	M5			Dams & Water Management/Use, Roads & Railroads
M	196	Tidal Marsh	Habitat Mgmt.	C	on-going	Decommission remnant or unused roads and dams in or near tidal marsh, intertidal, and subtidal habitats	M5			Dams & Water Management/Use, Roads & Railroads

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
M	198	Tidal Marsh	Habitat Mgmt.	H	on-going	Encourage installation of lower cost SGCN-friendly infrastructure in and near subtidal, intertidal, and tidal marsh habitats through technology development and transfer of technology	M2			Dams & Water Management/Use, Roads & Railroads
M	203	Tidal Marsh	Habitat Mgmt.	H	on-going	Time dredging projects in subtidal and tidal marsh habitats to minimize harm to SGCN based on migration and spawning cycles	M10	M1		Shipping Lanes
M	179	Tidal Marsh	Habitat Mgmt.	M	on-going	Maintain or create corridors between tidal marshes and other habitats used by tidal marsh SGCN	M3 M4			Annual & Perennial Non-timber crops, Commercial & Industrial Areas , Housing & Urban Areas, Livestock Farming & Ranching, Utility & Service Lines
M	182	Tidal Marsh	Habitat Mgmt.	M	new	Employ technology to reduce nutrient discharge adjacent to tidal marshes, e.g. storm water remediation measures including SmartSponge, infiltration chambers, and storm water settling areas	M2	M10		Agricultural & Forestry Effluents, Domestic & Urban Waste Water, Industrial & Military Effluents, Storms & Flooding
M	192	Tidal Marsh	Habitat Mgmt.	M	on-going	Re-route existing trails and/or boardwalks around tidal marshes to minimize foot traffic and disturbance to SGCN habitats	M10			Recreational Activities
M	195	Tidal Marsh	Policy	C	new	Provide incentives for building Stream Smart structures and road crossings in or near intertidal, subtidal, and tidal marsh habitats that allow for changing environmental conditions such as sea level rise and increased flooding	M5			Dams & Water Management/Use, Roads & Railroads
M	206	Tidal Marsh	Policy	C	new	Improve zoning practices to increase protection of upland buffers adjacent to tidal marshes, particularly where elevations are suitable for tidal marsh migration upslope in response to sea level rise	M3 M4			Annual & Perennial Non-timber crops, Commercial & Industrial Areas , Housing & Urban Areas, Livestock Farming & Ranching, Utility & Service Lines
M	197	Tidal Marsh	Policy	H	new	Implement through voluntary or regulatory means best standards for road/stream crossings in or near tidal marshes	M5			Dams & Water Management/Use, Roads & Railroads
M	199	Tidal Marsh	Policy	H	on-going	Increase enforcement of current laws and regulations regarding proper infrastructure (e.g., roads, dams, utility lines, shipping lanes) construction, maintenance, water quality, and fish passage in tidal marsh, intertidal, and subtidal SGCN habitats	M5	M6		Dams & Water Management/Use, Roads & Railroads

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
M	202	Tidal Marsh	Policy	H	new	Site shipping lanes and dredging projects to minimize negative impacts to intertidal and subtidal SGCN and their habitats	M1	M10		Shipping Lanes
M	204	Tidal Marsh	Policy	H	on-going	Continue to improve rapid response for oil and gas spills in intertidal and subtidal habitats, including state agencies efforts to have most up-to-date species maps, rapid response protocols in place, and regular scenario training	M1	M10		Shipping Lanes
M	188	Tidal Marsh	Policy	M	on-going	Strengthen regulations and enforcement of invasive species prevention measures in the shipping, transportation, and other industries	M6	M7		Invasive Non-native/Alien Species/Diseases, Problematic Native Species/Diseases
M	201	Tidal Marsh	Policy	M	on-going	Develop and provide model best practice maintenance and operating procedures (e.g., maintenance frequency, replacement schedules) for municipal, state, and private managers of infrastructure in tidal marshes	M5	M3M4		Dams & Water Management/Use, Roads & Railroads
M	181	Tidal Marsh	Public Outreach	H	on-going	Encourage partnership projects among transportation agencies, utility companies, etc. to facilitate fish passage and maintain connectivity in or near subtidal, intertidal, and tidal marsh habitats especially in cases where structures have different purposes for different users	M5			Dams & Water Management/Use, Roads & Railroads
M	200	Tidal Marsh	Public Outreach	H	on-going	Provide education and outreach through local meetings and trainings (e.g., Stream Smart) on techniques, problems and ecological effects of dams, roads, shipping lanes, and utility corridors on intertidal, subtidal, and tidal marsh habitats and publicize completed projects	M5	M3M4		Dams & Water Management/Use, Roads & Railroads
M	176	Tidal Marsh	Public Outreach	M	on-going	Provide outreach and education to homeowners and businesses to reduce their wastewater and storm water inputs into and effects on tidal marshes, including increased buffers and minimal fertilizer use	M1	M10		Agricultural & Forestry Effluents, Domestic & Urban Waste Water, Industrial & Military Effluents, Storms & Flooding
M	178	Tidal Marsh	Public Outreach	M	new	Research the efficacy of tidal marsh conversion	M3 M4			Annual & Perennial Non-timber crops, Commercial & Industrial Areas , Housing & Urban Areas, Livestock Farming & Ranching, Utility & Service Lines

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
M	186	Tidal Marsh	Public Outreach	M	new	Provide outreach and education to planners, developers, and homeowners about best management practices for site design, property maintenance, and landscaping adjacent to tidal marshes and their buffers	M1	M10		Annual & Perennial Non-timber crops, Commercial & Industrial Areas , Housing & Urban Areas, Livestock Farming & Ranching, Utility & Service Lines
M	187	Tidal Marsh	Public Outreach	M	on-going	Provide outreach and education to homeowners and municipalities regarding proper installation, maintenance, and removal of septic systems	M10	M1		Agricultural & Forestry Effluents, Domestic & Urban Waste Water, Industrial & Military Effluents, Storms & Flooding
M	189	Tidal Marsh	Public Outreach	M	on-going	Increase outreach and education on preventing the spread of invasive/problematic species and diseases in intertidal, subtidal, and tidal marsh habitats	M7			Invasive Non-native/Alien Species/Diseases, Problematic Native Species/Diseases
M	190	Tidal Marsh	Public Outreach	M	new	Provide incentives for converting land into tidal marsh or protecting existing tidal marsh	M7			Annual & Perennial Non-timber crops, Commercial & Industrial Areas , Housing & Urban Areas, Livestock Farming & Ranching, Utility & Service Lines
M	193	Tidal Marsh	Public Outreach	M	on-going	Deploy signage to notify recreationalists to the sensitivity of tidal marsh habitat	M10			Recreational Activities
M	184	Tidal Marsh	Research	M	on-going	Research and model marsh migration scenarios resulting from sea level rise	M10			Habitat Shifting or Alteration
M	177	Tidal Marsh	Survey & Monit.	H	on-going	Build upon and coordinate with existing monitoring efforts to establish a long term tidal marsh monitoring program, with emphasis on assessing sediment dynamics in the context of sea level rise	M3 M4			Annual & Perennial Non-timber crops, Commercial & Industrial Areas , Housing & Urban Areas, Livestock Farming & Ranching, Utility & Service Lines
M	191	Tidal Marsh	Survey & Monit.	H	on-going	Develop monitoring systems and rapid response plans to prevent the colonization of invasive/problematic species and diseases in intertidal, subtidal, and tidal marsh habitats	M5	M3M4		Invasive Non-native/Alien Species/Diseases, Problematic Native Species/Diseases
M	185	Tidal Marsh	Survey & Monit.	M	on-going	Continue and expand monitoring programs that track tidal marsh changes over time	M3 M4			Habitat Shifting or Alteration

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
TW	327	Floodplain Forests	Habitat Mgmt.	H	on-going	Conserve at-risk high value floodplain forests using a variety of approaches such as easements and acquisitions	TW8			Annual & Perennial Non-timber crops, Commercial & Industrial Areas , Housing & Urban Areas, Logging & Wood Harvesting, Roads & Railroads, Utility & Service Lines
TW	322	Floodplain Forests	Habitat Mgmt.	H	new	Encourage conservation owners to address floodplain forests in management plans	TW9			Dams & Water Management/Use, Invasive Non-native/Alien Species/Diseases, Logging & Wood Harvesting
TW	324	Floodplain Forests	Habitat Mgmt.	M	new	Develop logging and wood harvesting Habitat Management Guidelines for sensitive floodplain forest SGCN, if needed	TW1			Logging & Wood Harvesting
TW	328	Floodplain Forests	Habitat Mgmt.	M	new	Promote floodplain forest management/protection in forest certification program	TW10			Logging & Wood Harvesting
TW	326	Floodplain Forests	Habitat Mgmt.	M	new	Review current agricultural Best Management Practices to determine if floodplain forest SGCN are adequately considered	TW1			Logging & Wood Harvesting
TW	323	Floodplain Forests	Habitat Mgmt.	M	new	Review current Maine Forestry Best Management Practices to determine if floodplain forest SGCN are adequately considered	TW10	TW1		Logging & Wood Harvesting
TW	341	Floodplain Forests	Habitat Mgmt.	M	new	Support statewide invasive species monitoring and education programs in floodplain forests	TW6			Invasive Non-native/Alien Species/Diseases
TW	339	Floodplain Forests	Habitat Mgmt.	M	new	Use water bond funds to restore hydrologic connections to floodplain forests isolated by roads	TW8	TW11		Roads & Railroads
TW	325	Floodplain Forests	Habitat Mgmt.	M	new	Work with forest landowners to implement revised Habitat Management Guidelines in floodplain forests	TW10	TW1		Logging & Wood Harvesting

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
TW	333	Floodplain Forests	Policy	H	on-going	Champion current use taxation to discourage conversion of floodplain forests to other uses	TW2			Annual & Perennial Non-timber crops, Logging & Wood Harvesting
TW	337	Floodplain Forests	Policy	H	on-going	Develop state landowner incentive programs for floodplain forests	TW2			Annual & Perennial Non-timber crops, Housing & Urban Areas, Logging & Wood Harvesting
TW	334	Floodplain Forests	Policy	H	on-going	Improve non-federal match ratio for floodplain forest conservation projects	TW11	TW2		Annual & Perennial Non-timber crops, Commercial & Industrial Areas , Housing & Urban Areas, Logging & Wood Harvesting
TW	335	Floodplain Forests	Policy	H	on-going	Support habitat incentive programs by providing additional technical assistance for SGCN habitat management in floodplain forests	TW2			Annual & Perennial Non-timber crops, Logging & Wood Harvesting
TW	343	Floodplain Forests	Policy	M	new	Account for deer impacts to SGCN habitats in southern Maine floodplains during deer management planning process	TW7			Problematic Native Species/Diseases
TW	338	Floodplain Forests	Policy	M	new	Ensure consideration of buffers to floodplain forests in state funds for agriculture	TW8	TW11		Agricultural & Forestry Effluents, Annual & Perennial Non-timber crops
TW	340	Floodplain Forests	Policy	M	new	Find sources of non-federal match for federal programs offering riparian easements (e.g., USDA-Conservation Reserve Enhancement Program) especially for floodplain forests	TW11	TW2		Agricultural & Forestry Effluents, Annual & Perennial Non-timber crops, Logging & Wood Harvesting
TW	336	Floodplain Forests	Policy	M	new	Use land acquisition funds as match for habitat incentive programs in floodplain forests	TW11	TW2		Annual & Perennial Non-timber crops, Housing & Urban Areas, Logging & Wood Harvesting
TW	331	Floodplain Forests	Public Outreach	H	new	Provide high value floodplain location information to municipalities and land trusts through programs such as Beginning with Habitat	TW1			Annual & Perennial Non-timber crops, Commercial & Industrial Areas , Domestic & Urban Waste Water, Housing & Urban Areas, Industrial & Military Effluents, Logging & Wood Harvesting, Roads & Railroads, Utility &

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
										Service Lines
TW	329	Floodplain Forests	Public Outreach	M	new	Consider mapping Significant Wildlife Habitat within floodplains	TW1			Annual & Perennial Non-timber crops, Commercial & Industrial Areas , Housing & Urban Areas, Logging & Wood Harvesting, Roads & Railroads, Utility & Service Lines
TW	332	Floodplain Forests	Public Outreach	M	new	Develop outreach materials focused on community benefits derived from floodplain forests	TW1			Commercial & Industrial Areas , Housing & Urban Areas
TW	330	Floodplain Forests	Public Outreach	M	new	Identify and add high value floodplains to Beginning with Habitat maps	TW1			Annual & Perennial Non-timber crops, Commercial & Industrial Areas , Housing & Urban Areas, Logging & Wood Harvesting, Roads & Railroads, Utility & Service Lines
TW	342	Floodplain Forests	Survey & Monit.	M	new	Identify aggressive invasives in floodplain forests and pre-treat to prevent spread	TW6			Invasive Non-native/Alien Species/Diseases
TW	62	Freshwater Marshes	Habitat Mgmt.	H	on-going	Conserve freshwater marsh buffers using fee acquisition and easements (permanent and term)	TW8	TW5		Agricultural & Forestry Effluents, Commercial & Industrial Areas , Domestic & Urban Waste Water, Housing & Urban Areas, Roads & Railroads, Utility & Service Lines
TW	64	Freshwater Marshes	Habitat Mgmt.	M	on-going	Conserve freshwater marshes and other high value SGCN wetland habitats using fee acquisition and easements (permanent and term)	TW8			Commercial & Industrial Areas , Housing & Urban Areas, Roads & Railroads, Utility & Service Lines
TW	66	Freshwater Marshes	Habitat Mgmt.	M	new	Develop water control level standards for freshwater marshes in wildlife management areas	TW9			Annual & Perennial Non-timber crops, Habitat Shifting or Alteration, Livestock Farming & Ranching

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
TW	59	Freshwater Marshes	Habitat Mgmt.	M	new	Target invasive species control at high value wetlands	TW6			Invasive Non-native/Alien Species/Diseases
TW	68	Freshwater Marshes	Policy	M	on-going	Provide incentives for agricultural practices that benefit freshwater marshes	TW2			Annual & Perennial Non-timber crops, Livestock Farming & Ranching
TW	61	Freshwater Marshes	Public Outreach	H	on-going	Provide information to municipalities and land trusts on high priority freshwater wetlands near or bisected by roads through programs such as Beginning with Habitat	TW1	TW5		Agricultural & Forestry Effluents, Commercial & Industrial Areas , Domestic & Urban Waste Water, Livestock Farming & Ranching, Roads & Railroads, Utility & Service Lines
TW	60	Freshwater Marshes	Survey & Monit.	C	new	Identify high priority road segments/culverts for organism passage among freshwater wetlands	TW1	TW5		Roads & Railroads
TW	345	Grassland-shrubland-early Successional	Habitat Mgmt.	C	on-going	Promote management of grasslands, shrublands, and early successional SGCN habitats on conservation lands, wildlife management areas, etc.	TW9	TW3	TW4	Annual & Perennial Non-timber crops, Other Ecosystem Modifications
TW	351	Grassland-shrubland-early Successional	Habitat Mgmt.	H	on-going	Conserve grass/shrub habitats using a variety of approaches such as permanent and term easements and land acquisition	TW8	TW3	TW4	Annual & Perennial Non-timber crops, Commercial & Industrial Areas , Housing & Urban Areas, Utility & Service Lines
TW	346	Grassland-shrubland-early Successional	Habitat Mgmt.	H	new	Focus conservation of grassland, shrub, and early successional SGCN habitat in areas not in conflict with economics and existing management practices	TW3			Annual & Perennial Non-timber crops, Commercial & Industrial Areas , Housing & Urban Areas
TW	349	Grassland-shrubland-early Successional	Habitat Mgmt.	M	on-going	Develop best management practices for retaining a shrub component around agricultural fields	TW3	TW4		Annual & Perennial Non-timber crops
TW	344	Grassland-shrubland-early Successional	Habitat Mgmt.	M	on-going	Promote Integrated Pest Management to reduce pesticide use in blueberry barrens	TW7	TW6	TW3	Annual & Perennial Non-timber crops

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
TW	352	Grassland-shrubland-early Successional	Policy	H	new	Establish protections for landowners managing for SGCN (e.g., Safe Harbor Agreements) in grassland, shrub, and early successional habitats	TW2	TW3	TW4	Annual & Perennial Non-timber crops, Housing & Urban Areas, Utility & Service Lines
TW	350	Grassland-shrubland-early Successional	Policy	H	new	Research what is needed to establish term easements for grassland, shrub, and early-successional SGCN habitats	TW8	TW3	TW12	Annual & Perennial Non-timber crops, Housing & Urban Areas, Utility & Service Lines
TW	353	Grassland-shrubland-early Successional	Policy	H	on-going	Support habitat incentive programs by providing additional technical assistance for SGCN habitat management in grasslands, shrublands, and early-successional habitats	TW2	TW3	TW4	Annual & Perennial Non-timber crops, Housing & Urban Areas, Utility & Service Lines
TW	354	Grassland-shrubland-early Successional	Policy	M	on-going	Provide better forgone income incentives (e.g., deferred harvest of hay, deferred grazing of portions of pasture, harvest trees earlier than usual) to encourage grassland, shrub, and early successional habitat management practices beneficial to SGCN	TW2	TW3	TW4	Annual & Perennial Non-timber crops
TW	361	Grassland-shrubland-early Successional	Policy	M	new	Work with municipalities/towns to reduce zoning conflicts that impede needed habitat management in grasslands, shrublands, and early successional SGCN habitat	TW3			Annual & Perennial Non-timber crops, Commercial & Industrial Areas , Housing & Urban Areas, Utility & Service Lines
TW	362	Grassland-shrubland-early Successional	Public Outreach	M	on-going	Deploy better and more signage promoting conservation of grassland, shrub, early successional habitats, and their associated SGCN	TW3			Annual & Perennial Non-timber crops, Housing & Urban Areas
TW	364	Grassland-shrubland-early Successional	Public Outreach	M	new	Establish and promote demonstration areas highlighting habitat management for grassland, shrub, and early successional SGCN	TW3			Annual & Perennial Non-timber crops, Commercial & Industrial Areas , Housing & Urban Areas, Utility & Service Lines
TW	359	Grassland-shrubland-early Successional	Public Outreach	M	on-going	Incorporate more public outreach information on multiple species (e.g., not just New England Cottontail) that are declining due to lack of suitable grassland, shrub, or early successional habitat	TW3			Annual & Perennial Non-timber crops, Commercial & Industrial Areas , Housing & Urban Areas, Roads & Railroads, Utility & Service Lines
TW	363	Grassland-shrubland-early Successional	Public Outreach	M	on-going	Promote better communication tools and training on grassland/shrub habitat conservation	TW3			Annual & Perennial Non-timber crops, Commercial & Industrial Areas , Housing & Urban Areas, Roads & Railroads, Utility & Service Lines

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
TW	357	Grassland-shrubland-early Successional	Public Outreach	M	on-going	Promote community and land trust stewardship of grassland, shrub, and early-successional SGCN habitats through outreach programs such as Beginning with Habitat	TW1	TW3		Commercial & Industrial Areas , Housing & Urban Areas
TW	360	Grassland-shrubland-early Successional	Public Outreach	M	new	Reinforce and acknowledge good management practices by utility companies along utility corridors that contain grasslands, shrublands, and early successional SGCN habitats	TW3	TW4		Utility & Service Lines
TW	358	Grassland-shrubland-early Successional	Public Outreach	M	on-going	Target outreach to Soil Water Conservation Districts, Maine Farmland Trust, landowners, and others on the importance of grasslands, shrublands, and early successional SGCN habitats	TW3			Annual & Perennial Non-timber crops, Housing & Urban Areas
TW	347	Grassland-shrubland-early Successional	Survey & Monit.	C	new	Research and identify explicit areas and amounts of grassland, shrub, and early successional habitats needed to conserve target SGCN	TW1	TW3	TW12	Housing & Urban Areas, Utility & Service Lines, Annual & Perennial Non-timber crops, Commercial & Industrial Areas
TW	348	Grassland-shrubland-early Successional	Survey & Monit.	H	on-going	Assist municipal planning, through programs such as Beginning with Habitat, to identify key grassland, shrub, and early successional SGCN habitats	TW1	TW3	TW4	Annual & Perennial Non-timber crops, Commercial & Industrial Areas , Housing & Urban Areas, Utility & Service Lines
TW	355	Grassland-shrubland-early Successional	Survey & Monit.	H	new	Map and distribute information on existing ruderal habitats	TW1	TW3	TW4	Annual & Perennial Non-timber crops, Commercial & Industrial Areas , Housing & Urban Areas, Roads & Railroads, Utility & Service Lines
TW	356	Grassland-shrubland-early Successional	Survey & Monit.	H	new	Map potential ruderal habitats	TW1	TW3	TW4	Annual & Perennial Non-timber crops, Commercial & Industrial Areas , Housing & Urban Areas, Roads & Railroads, Utility & Service Lines
TW	35	Northern Forests and Swamps	Habitat Mgmt.	C	on-going	Conserve northern forest and swamp habitats using a variety of approaches such as acquisitions, easements, and leases	TW8	TW5		Commercial & Industrial Areas , Housing & Urban Areas, Logging & Wood Harvesting, Roads & Railroads, Tourism & Recreational Areas, Utility & Service Lines
TW	42	Northern Forests and Swamps	Habitat Mgmt.	C	on-going	Promote greater MDIFW involvement with forest certification to help support conservation/management of SGCN habitats in northern forests and swamps	TW10	TW4	TW5	Logging & Wood Harvesting

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
TW	36	Northern Forests and Swamps	Habitat Mgmt.	C	new	Provide landowner incentives for SGCN habitat management in northern forests and swamps and south-central forests and swamps	TW2			Commercial & Industrial Areas , Logging & Wood Harvesting, Roads & Railroads, Tourism & Recreational Areas, Utility & Service Lines
TW	43	Northern Forests and Swamps	Habitat Mgmt.	C	new	Provide opportunities for MDIFW participation in outcome-based forestry	TW10	TW4	TW5	Logging & Wood Harvesting
TW	41	Northern Forests and Swamps	Habitat Mgmt.	C	new	Provide opportunities for MDIFW's participation in Maine Forest Practices Act discussions and encourage outcome-based forestry for landscape scale habitat management	TW10	TW4	TW5	Logging & Wood Harvesting
TW	33	Northern Forests and Swamps	Habitat Mgmt.	H	on-going	Consider alternate chemicals or techniques to control invasive species and diseases in northern forests and swamps (especially spruce budworm) and south-central forests and swamps	TW7			Problematic Native Species/Diseases
TW	39	Northern Forests and Swamps	Policy	C	on-going	Apply existing land-use standards to minimize effects of development (e.g., housing, roads, recreational areas, etc.) on northern forest and swamp SGCN habitats	TW8	TW5		Commercial & Industrial Areas , Housing & Urban Areas, Renewable Energy, Roads & Railroads, Tourism & Recreational Areas, Utility & Service Lines
TW	40	Northern Forests and Swamps	Policy	C	new	Champion existing tree growth tax law to discourage conversion of northern forest and swamp SGCN habitats to other non-forested land types	TW2	TW5		Commercial & Industrial Areas , Housing & Urban Areas, Logging & Wood Harvesting, Roads & Railroads, Utility & Service Lines
TW	23	Northern Forests and Swamps	Policy	C	on-going	DELETED	Delete			Fire & Fire Suppression
TW	21	Northern Forests and Swamps	Public Outreach	C	on-going	Increase outreach and education to the public and landowners on the role of fire in maintaining northern forest and swamp SGCN habitats	TW4	TW5		Fire & Fire Suppression, Habitat Shifting or Alteration
TW	44	Northern Forests and Swamps	Public Outreach	C	on-going	Provide outreach and education to the general public on the importance of societal consumption of forest products for providing SGCN habitat through forest habitat management	TW4			Logging & Wood Harvesting

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
TW	26	Northern Forests and Swamps	Public Outreach	C	new	Provide outreach to landowners and the public on the effects of roads on northern forest and swamp SGCN habitats	TW4			Roads & Railroads
TW	45	Northern Forests and Swamps	Public Outreach	H	on-going	Provide outreach and education to recreationalists on reducing impacts to northern forest and swamp SGCN habitats	TW4			Recreational Activities, Tourism & Recreational Areas
TW	29	Northern Forests and Swamps	Public Outreach	H	on-going	Provide outreach to recreationalists on reducing impacts of recreational activities on northern forest and swamp SGCN habitats	TW4			Recreational Activities
TW	20	Northern Forests and Swamps	Research	C	new	Continue research to better understand and mitigate impacts of climate change on northern forest and swamp SGCN habitats	TW12	TW5		Habitat Shifting or Alteration
TW	31	Northern Forests and Swamps	Survey & Monit.	C	new	Assess conserved lands, especially northern forests and swamps and rocky summits/outcrops/mountaintops, for climate change resiliency and use this information to guide future conservation efforts	TW5	TW9		Habitat Shifting or Alteration
TW	32	Northern Forests and Swamps	Survey & Monit.	C	new	Identify and conserve boreal forest refugia associated with SGCN	TW5			Habitat Shifting or Alteration
TW	38	Northern Forests and Swamps	Survey & Monit.	H	on-going	Continue long-term monitoring of SGCN and SGCN habitats associated with northern forests and swamps	TW12	TW4		Commercial & Industrial Areas , Housing & Urban Areas, Logging & Wood Harvesting, Roads & Railroads, Utility & Service Lines
TW	34	Northern Forests and Swamps	Survey & Monit.	H	on-going	Continue monitoring for invasive and problematic species and diseases, especially forest insect pests, in northern forest and swamps and south-central forests and swamps	TW6			Invasive Non-native/Alien Species/Diseases
TW	30	Northern Forests and Swamps	Survey & Monit.	H	on-going	Continue stewardship/habitat monitoring on conserved northern forest and swamp lands	TW9			Recreational Activities

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
TW	48	Pine Barrens	Habitat Mgmt.	H	on-going	Conserve pine barrens via habitat acquisition	TW8	TW5		Annual & Perennial Non-timber crops, Recreational Activities
TW	49	Pine Barrens	Habitat Mgmt.	M	new	Champion property tax incentives to encourage pine barren habitat management on private land	TW2	TW5		Annual & Perennial Non-timber crops, Recreational Activities
TW	56	Pine Barrens	Habitat Mgmt.	M	new	Recognize pine barren landowners for effective habitat management	TW2	TW5		Fire & Fire Suppression, Invasive Non-native/Alien Species/Diseases, Recreational Activities
TW	58	Pine Barrens	Habitat Mgmt.	M	new	Use a variety of easement types to acquire barrens or buffers surrounding pine barrens	TW8	TW5		Commercial & Industrial Areas , Housing & Urban Areas, Mining & Quarrying, Roads & Railroads, Utility & Service Lines
TW	55	Pine Barrens	Policy	C	new	Promote inter-agency prescribed fire training in pine barrens	TW9	TW2		Fire & Fire Suppression
TW	53	Pine Barrens	Policy	C	new	Provide cost-share for mechanical treatments where fire management is not practical in pine barrens	TW9	TW2		Fire & Fire Suppression
TW	52	Pine Barrens	Policy	C	new	Secure stable funding for fire management in pine barrens	TW2			Fire & Fire Suppression
TW	54	Pine Barrens	Policy	C	new	Use agreements (e.g., MOU's) and partnerships to increase fire management capacity in pine barrens	TW9	TW2		Fire & Fire Suppression
TW	50	Pine Barrens	Policy	M	on-going	Champion endangered species policy that supports pine barren habitat management	TW5			Annual & Perennial Non-timber crops, Recreational Activities

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
TW	51	Pine Barrens	Policy	M	new	Change state fire management liability policy to allow prescribed burns in pine barrens near private land	TW9			Fire & Fire Suppression
TW	57	Pine Barrens	Public Outreach	M	new	Develop outreach/education to municipal planners and land trusts on the importance of pine barrens through programs such as Beginning with Habitat	TW1	TW5		Fire & Fire Suppression, Invasive Non-native/Alien Species/Diseases, Recreational Activities, Utility & Service Lines
TW	17	Rocky Summits-Outcrops-Mountaintops	Public Outreach	H	on-going	Provide outreach and education to recreationalists on reducing impacts to rocky summits, outcrops, and mountaintop SGCN habitats	TW5	TW9		Recreational Activities
TW	16	Rocky Summits-Outcrops-Mountaintops	Research	C	new	Continue research to better understand and mitigate impacts of climate change on rocky summits, outcrops, and mountaintop SGCN habitats	TW12	TW5		Habitat Shifting or Alteration
TW	15	Rocky Summits-Outcrops-Mountaintops	Survey & Monit.	C	new	Assess conserved lands, especially northern forests and swamps and rocky summits/outcrops/mountaintops, for climate change resiliency and use this information to guide future conservation efforts	TW5			Habitat Shifting or Alteration
TW	18	Rocky Summits-Outcrops-Mountaintops	Survey & Monit.	H	on-going	Continue habitat/recreational monitoring stewardship on conserved rocky summit, outcrop, and mountaintop SGCN habitats	TW9			
TW	65	South-Central Forests and Swamps	Habitat Mgmt.	C	new	Provide landowner incentives for SGCN habitat management in northern forests and swamps and south-central forests and swamps	TW2			Commercial & Industrial Areas , Housing & Urban Areas, Roads & Railroads, Utility & Service Lines
TW	69	South-Central Forests and Swamps	Habitat Mgmt.	H	new	Develop and distribute habitat management guidelines for south-central forests and swamp SGCN habitats	TW1			Commercial & Industrial Areas , Housing & Urban Areas, Logging & Wood Harvesting, Roads & Railroads, Utility & Service Lines
TW	67	South-Central Forests and Swamps	Habitat Mgmt.	H	on-going	Identify, map, and provide information to the public through programs such as Beginning with Habitat for SGCN habitats in south-central forests and swamps	TW1			Commercial & Industrial Areas , Housing & Urban Areas, Roads & Railroads, Utility & Service Lines

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
TW	80	South-Central Forests and Swamps	Habitat Mgmt.	M	on-going	Collaborate with on-going invasive species eradication/early identification efforts in south central forest and swamp SGCN habitats	TW6			Invasive Non-native/Alien Species/Diseases
TW	63	South-Central Forests and Swamps	Habitat Mgmt.	M	on-going	Conserve south-central forest and swamp habitats using a variety of approaches such as acquisitions, easements, and leases	TW8			Commercial & Industrial Areas , Housing & Urban Areas, Recreational Activities, Roads & Railroads, Utility & Service Lines
TW	70	South-Central Forests and Swamps	Public Outreach	C	on-going	Increase outreach and education to landowners and the public on the effects of development (e.g., housing, roads, utility lines) on south-central forest and swamp SGCN habitats	TW1			Commercial & Industrial Areas , Housing & Urban Areas, Roads & Railroads, Utility & Service Lines
TW	72	South-Central Forests and Swamps	Public Outreach	H	on-going	Develop outreach and location information on SGCN habitats in south-central forests and swamps for land trusts, municipalities, and landowners through programs such as Beginning with Habitat	TW1			Commercial & Industrial Areas , Housing & Urban Areas, Roads & Railroads, Utility & Service Lines
TW	77	South-Central Forests and Swamps	Public Outreach	H	on-going	Increase outreach and education to the public, landowners, and hunters and trappers on the effects of over-abundant native species (e.g., deer, beaver) on south-central forest and swamp SGCN habitats	TW7			Problematic Species/Diseases of Unknown Origin
TW	76	South-Central Forests and Swamps	Public Outreach	M	new	Provide spatial information on invasive species to landowners, towns, land trusts, etc., especially for south-central forest and swamp SGCN habitats	TW6	TW1		Invasive Non-native/Alien Species/Diseases
TW	73	South-Central Forests and Swamps	Research	H	on-going	Consider alternate chemicals or techniques to control invasive species and diseases in northern forests and swamps (especially for spruce budworm) and south-central forests and swamps	TW6			Invasive Non-native/Alien Species/Diseases
TW	78	South-Central Forests and Swamps	Species Mgmt.	C	on-going	Increase deer hunting/beaver trapping opportunity to reduce impacts of these species on south-central forest and swamp SGCN habitats	TW7			Problematic Native Species/Diseases
TW	79	South-Central Forests and Swamps	Species Mgmt.	H	on-going	Account for deer/beaver impacts to SGCN habitats in south-central forests and swamps during species management planning process	TW7			Problematic Native Species/Diseases

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
TW	74	South-Central Forests and Swamps	Survey & Monit.	H	on-going	Continue monitoring for invasive and problematic species and diseases, especially forest insect pests, in northern forests and swamps and south-central forests and swamps	TW6	TW7	TW12	Invasive Non-native/Alien Species/Diseases
TW	71	South-Central Forests and Swamps	Survey & Monit.	H	on-going	Undertake long-term monitoring of SGCN and their habitats in south-central forests and swamps	TW12			Commercial & Industrial Areas , Housing & Urban Areas, Roads & Railroads, Utility & Service Lines
TW	75	South-Central Forests and Swamps	Survey & Monit.	M	new	Partner with MaineDOT to identify invasive plant "hotspots" along roads and bridges, especially in south-central forests and swamps	TW6			Invasive Non-native/Alien Species/Diseases
TW	9	Vernal Pools	Habitat Mgmt.	C	on-going	Conserve high value vernal pool complexes using a variety of approaches such as acquisitions and easements	TW8	TW5		Commercial & Industrial Areas , Habitat Shifting or Alteration, Housing & Urban Areas, Logging & Wood Harvesting, Roads & Railroads, Utility & Service Lines
TW	14	Vernal Pools	Habitat Mgmt.	M	on-going	Continue work with forestry community on vernal pool Habitat Management Guidelines	TW1	TW10		Logging & Wood Harvesting
TW	2	Vernal Pools	Habitat Mgmt.	M	new	Identify ongoing opportunities/partnerships for invasive plant species management in vernal pools	TW6			Invasive Non-native/Alien Species/Diseases
TW	4	Vernal Pools	Policy	H	new	Develop vernal pool organism passage standards for new and existing road crossing structures	TW5	TW8		Roads & Railroads
TW	11	Vernal Pools	Public Outreach	H	on-going	Encourage better promulgation of vernal pool Best Development Practices through outreach programs such as Beginning with Habitat	TW1			Commercial & Industrial Areas , Housing & Urban Areas
TW	13	Vernal Pools	Public Outreach	M	new	Better integrate social sciences into vernal pool outreach messaging (e.g., economic benefit of pools, relation to game species, etc.)	TW1			Commercial & Industrial Areas , Housing & Urban Areas, Roads & Railroads, Utility & Service Lines

Habitat Workgroup	Action ID#	Habitat Group	Action Category	Biol. Priority	Action Type	Description	Theme1	Theme2	Theme3	Stressors Addressed*
TW	7	Vernal Pools	Public Outreach	M	on-going	Update Beginning with Habitat's roads and riparian connectivity layer and include models specific to vernal pool SGCN	TW1			Commercial & Industrial Areas , Habitat Shifting or Alteration, Housing & Urban Areas, Roads & Railroads, Utility & Service Lines
TW	12	Vernal Pools	Public Outreach	M	on-going	Use event-specific (e.g., big night, turtle nesting) outreach to draw greater public attention to vernal pools	TW1			Housing & Urban Areas, Roads & Railroads
TW	6	Vernal Pools	Research	C	new	Identify connectivity hotspots among developable high value vernal pools, pool complexes, and non-breeding habitat	TW1			Commercial & Industrial Areas , Habitat Shifting or Alteration, Logging & Wood Harvesting, Roads & Railroads
TW	8	Vernal Pools	Research	C	new	Research, develop, and document a statewide potential vernal pool map	TW1			Commercial & Industrial Areas , Habitat Shifting or Alteration, Housing & Urban Areas, Logging & Wood Harvesting, Roads & Railroads, Utility & Service Lines
TW	10	Vernal Pools	Research	H	on-going	Identify and implement research opportunities exploring ecosystem requirements of specialized vernal pool taxa	TW12			Commercial & Industrial Areas , Droughts, Habitat Shifting or Alteration, Housing & Urban Areas, Roads & Railroads, Storms & Flooding, Temperature Extremes, Utility & Service Lines
TW	3	Vernal Pools	Research	M	new	Identify and implement research opportunities investigating effects of invasive species on vernal pool organisms and hydrology	TW12			Invasive Non-native/Alien Species/Diseases
TW	5	Vernal Pools	Research	M	new	Identify and implement research opportunities investigating effects of invasive species on vernal pool organisms and hydrology	TW6			Roads & Railroads
TW	1	Vernal Pools	Research	M	new	Research and identify likely climate change impacts to high value vernal pools and incorporate into forestry and municipal Habitat Management Guidelines	TW5	TW8	TW10	Droughts, Habitat Shifting or Alteration, Storms & Flooding, Temperature Extremes

List of Acronyms

BwH	Beginning with Habitat
CMP	Conservation Measures Partnership
COA	Conservation Opportunity Areas
CWCS	Comprehensive Wildlife Conservation Strategy
DMR	Maine Dept. of Marine Resources
MCP	Maine Coastal Program
MDIFW	Maine Dept. of Inland Fisheries and Wildlife
MNAP	Maine Natural Areas Program
MTA2C	Mount Agamenticus to the Sea Conservation Initiative
RCN	Regional Conservation Needs
SGCN	Species of Greatest Conservation Need
SMART	Specific, Measurable, Achievable, Results-oriented, and Time-bound
SWAP	State Wildlife Action Plan
SWG	State Wildlife Grants
TNC	The Nature Conservancy

List of Figures

List of Tables

Literature Cited

AFWA. 2012. Best Practices Working Group. 2012. Best Practices for State Wildlife Action Plans – Voluntary Guidance to States for Revision and Implementation. Washington (DC): Association of Fish and Wildlife Agencies. 80 pages. Association of Fish and Wildlife Agencies, Teaming With Wildlife, State Wildlife Action Plan (SWAP)

Anderson, M.G. M. Clark, C.E. Ferree, A. Jospe, A. Olivero Sheldon and K.J. Weaver. 2013. Northeast Habitat Guides: A companion to the terrestrial and aquatic habitat maps. The Nature Conservancy, Eastern Conservation Science, Eastern Regional Office. Boston, MA. http://nature.ly/HabitatGuide.

CMP. 2013. Open Standards for the Practice of Conservation. Conservation Measures Partnership.

Maine Dept. of Inland Fisheries and Wildlife. 2005. Maine's comprehensive wildlife conservation strategy. Maine Dept. of Inland Fisheries and Wildlife, Augusta, Maine.

Appendices

None