



DRAFT: FOR PUBLIC REVIEW

MAINE'S 2015 WILDLIFE ACTION PLAN

A product of

Maine Department of Inland Fisheries and Wildlife
Maine Department of Marine Resources
and
Maine's Conservation Partners

Draft July 13, 2015



MISSION OF THE MAINE DEPARTMENT OF INLAND FISHERIES AND WILDLIFE

The Department of Inland Fisheries and Wildlife is established to preserve, protect and enhance the inland fisheries and wildlife resources of the State; encourage the wise use of these resources; ensure coordinated planning for the future use and preservation of these resources, and provide for effective management of these resources.

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MISSION OF THE DEPARTMENT OF MARINE RESOURCES

The Department of Marine Resources is established to conserve and develop marine and estuarine resources; conduct and sponsor scientific research; promote and develop the Maine coastal fishing industries; advise and cooperate with local, state and federal officials concerning activities in coastal waters; and to implement, administer and enforce the laws and regulations necessary for these enumerated purposes.

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FORWARD

In preparation.

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EXECUTIVE SUMMARY

INTRODUCTION

Located at the northeast tip of the United States, the State of Maine is approximately 320 miles long and 210 miles wide. It is almost as large (33,315 square miles) as all other New England states combined. Maine is a land rich in contrasts between the boreal and temperate, freshwater and saltwater, upland and wetland, and alpine and lowlands. Maine is a transition area, and its wildlife resources represent a blending of species that are at or approaching the northern or southern limit of their ranges. This mosaic of diverse physical settings supports a wide diversity of wildlife that can be equaled in few other states.

Fish and wildlife play an important role in the lives of Maine people as they provide a source of enjoyment, recreation, and employment -- Maine's quality of life, its traditional "outdoor" values, and its economy, particularly its rural economy, are strongly shaped by the diversity and abundance of its fish and wildlife. The public has entrusted the conservation of Maine's fish and wildlife to the Maine Dept. of Inland Fisheries and Wildlife (MDIFW) and the Maine Dept. of Marine Resources (MDMR).

Maine's 2015 Wildlife Action Plan addresses the full array of wildlife and their habitats in Maine - vertebrates and invertebrates in terrestrial and aquatic (freshwater, estuarine, and marine) habitats – and wildlife is defined as any species of wild, free-ranging fauna including fish. It builds on a long history of public involvement and collaboration among conservation partners. It is meant to be dynamic, responsive, and adaptive. Hence, Maine's Action Plan serves as a solid foundation for the future of wildlife conservation that will help guide the collaborative efforts of state and federal agencies, tribes, conservation partners, and individuals to ensure success.

Road Map to the Eight Required Elements: To facilitate review of Maine's Action Plan, each of the eight required elements are addressed in separate chapters: elements 1, 2, 3, and 4 each have a unique chapter; we have combined elements 5 and 6 and also 7 and 8 into a single chapter because of their close relationships.

Element 1 – Species of Greatest Conservation Need

A critical dilemma facing conservation biologists and managers worldwide is the need to allocate limited dollars, staff, and programmatic resources toward an ever-growing list of conservation challenges. Foundational to this prioritization process in Maine's State Wildlife Action Plan is the development of a list of species of greatest conservation need (SGCN). Biologists from Maine Department of Inland Fisheries and Wildlife (MDIFW) and Maine Department of Marine Resources (MDMR), with cooperation from conservation partners and species experts, developed a suite of objective criteria for designating SGCN that is intended to be transparent and science-based, and recognizes that species conservation concerns can be identified at global, regional, and local scales. The primary themes for SGCN prioritization

include risk of extirpation, population trend, endemism, and regional conservation concerns. Secondary themes for SGCN prioritization include climate change vulnerability, survey knowledge, and indigenous cultural significance. Maine's 2005 list of SGCN totaled 213 species grouped into two priority levels. To help further advance the challenge of species prioritization, Maine's 2015 list of 376 SGCN are assigned to three species priority levels: Priority 1 (Highest; 58 SGCN), Priority 2 (High; 131 SGCN), and Priority 3 (Moderate; 187 SGCN), all of which are eligible for State Wildlife Grant (SWG) assistance from the U.S. Fish and Wildlife Service. The 2015 process for reviewing and identifying Maine SGCN included both species deletions (34) and additions (197) to the 2005 list. The net increase in SGCN is driven primarily from a) additional conservation science designation criteria, b) scrutiny of more invertebrate taxa, c) significantly greater attention to marine fauna in the Gulf of Maine, and d) more explicit recognition of climate change vulnerability. It is our hope that identifying a relatively comprehensive, prioritized suite of SGCN will help MDIFW, MDMR, and conservation partners implement meaningful conservation actions for some of Maine's most vulnerable and valued wildlife resources over the coming decade.

Differences from Maine's 2005 Comprehensive Wildlife Conservation Strategy are discussed.

Element 2 – Key Habitats and Natural Communities

Maine's Wildlife Action Plan employs The Northeast Terrestrial Habitat Classification System (NETHCS), developed by NatureServe and The Nature Conservancy (TNC), to identify the extent of habitats and community types essential to the conservation of Species of Greatest Conservation Need (SGCN). Federal and state agencies in the Northeast have endorsed the NETHCS as a tool for assessing habitat distribution and composition. The specific version of the NETHCS used in Maine includes a number of modifications made by the Maine Dept. of Marine Resources (MDMR) and the Maine Dept. of Inland Fisheries and Wildlife (MDIFW) to reflect Maine's landscape and coastal features. The basic layer within NETHCS is the habitat 'system', which corresponds to the Ecological Systems classification. There are approximately 150 Ecological Systems in Maine. The more general 'Macrogroup' level was used for several of our analyses, and there are 42 habitat macrogroups in Maine.

Maine further consolidated the macrogroups into three broad habitat categories to facilitate development of conservation actions. The broad categories are Coastal and Marine, Terrestrial (including Freshwater Wetlands) and Freshwater Aquatic (Rivers, Lakes, and Ponds). The importance of various habitats to SGCN is not related to their statewide abundance; habitats such as pine barrens, open freshwater wetlands, and rivers and streams are disproportionately important compared to many other habitat types. It is estimated that there are 3,824,842 acres of conservation land in Maine, accounting for nearly 20% of the State. Much of this conserved land lies within Focus Areas of Statewide Significance, which have been identified to help prioritize Maine's landscape for SGCN and other habitat values.

Differences from Maine's 2005 Comprehensive Wildlife Conservation Strategy are discussed.

Element 3 – Problems Affecting SGCN and Their Habitats

Maine's Wildlife Action Plan focuses much attention on the habitats used by Species of Greatest Conservation Need (SGCN). The Plan uses a coarse filter – fine filter approach to conservation to ensure, where possible, that individual conservation initiatives benefit multiple species, while also acknowledging that some species require individualized attention. We assigned stressors to both habitats and to SGCN, in order to clearly identify the issues that should be addressed at each level in the conservation hierarchy. As with most other states in the Northeast, we identified stressors using the International Union for the Conservation of Nature (IUCN) Threat Classification Scheme. While the IUCN system is useful for categorizing stressors to SGCN and their habitats, we found that the system lacks the resolution to clearly identify the specific issues that should be considered for conservation attention. Therefore, when assigning stressors we chose to adopt the primary and secondary IUCN categories, but replaced the tertiary category with a detailed narrative that fully describes the issue and its impact on the species or habitat being considered. In addition, we adapted Table 7 (*Threat characteristics and categorical ratings*) from The Northeast Lexicon to identify characteristics for each stressor assignment.

We assigned stressors to Priority 1 and 2 SGCN, and assigned 'Severity' and 'Actionability' characteristics for each Stressor – SGCN interaction. The concepts of Likelihood, Certainty and Spatial Extent were considered implicitly, and only those Stressors that were determined to have a moderate or high impact for each of these characteristics were assigned. In addition, only those stressors with moderate or high severity were assigned to SGCN. In addition, we developed a simple matrix to prioritize SGCN stressors, using the combination of the Impact scores for 'Severity' and 'Actionability.' We identified stressors for terrestrial and freshwater aquatic habitats using Anderson et al. (2013) as our primary source of reference material. Because no single comprehensive source is available that describes that state of marine habitats along Maine's coast, we used a wide variety of scientific publications to compile information on stressors. We assumed that the habitat systems within each terrestrial and marine macrogroup all faced similar conservation problems; therefore we assigned stressors to each macrogroup, but did not identify stressors separately for each habitat system, with the exception of freshwater aquatic habitats (River and Streams, and Lakes and Ponds) where we identified stressors separately for each of systems. Unlike our approach for SGCN, we assigned all 7 stressor characteristics for each habitat – stressor combination.

We assigned 38 unique stressors to 190 Priority 1 and 2 SGCN species, for a total of 1,108 SGCN – stressor combinations. Habitat Shifting or Alteration, Lack of Knowledge, and Fishing and Harvesting of Aquatic Resources were identified as stressors for the largest number of total SGCN. Lack of Knowledge, Agricultural and Forestry Effluents, and Fishing and Harvesting of Aquatic Resources were identified as medium-high or high priority stressors for the largest number of SGCN. We assigned 31 unique stressors to 34 habitats macrogroups, for a total of 342 habitat – stressor combinations. Invasive Non-native/Alien Species/Diseases, Roads and Railroads, and Housing and Urban Areas were assigned to the largest number of habitats.

Differences from Maine's 2005 Comprehensive Wildlife Conservation Strategy are discussed.

Element 4 – Conservation Actions

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 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, 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.

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.

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.

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 5 – Monitoring Element 6 – Periodic Review

We outline the methods we will use to monitor SGCN and their habitats, describe how we will monitor the progress made in implementing the Action Plan over the next ten years, and address the procedures we will use to review and update the Action Plan. We work closely with federal, state, and private conservation partners to develop and participate in cooperative species monitoring programs. Where possible, monitoring programs target multiple species, usually within the same taxonomic group. In the pages that follow, we describe the monitoring

programs that are in place for SGCN in Maine. We include a table for each of the five taxonomic groups that are referenced throughout this plan.

MDIFW and partners identified habitat-scale survey and monitoring needs during development of conservation actions. We present these actions with examples of existing and general survey and monitoring techniques that could be used to achieve these habitat monitoring objectives.

MDIFW and partners developed 11 programmatic actions to help guide Action Plan implementation over the next ten years. Three of these actions address monitoring and are described in greater detail.

MDIFW will use the programmatic actions to monitor conservation action progress at least annually. MDIFW will also establish an Implementation Committee in the Fall 2015 comprised of agency staff and conservation partners. This committee will review Action Plan accomplishments and address emerging issues or adaptive management needs. We will undertake a comprehensive plan review beginning in year eight of the 2015 Action.

Differences from Maine's 2005 Comprehensive Wildlife Conservation Strategy are discussed.

Element 7 – Coordination with Partners **Element 8 – Public Participation**

Maine has a long history of successful collaboration among conservation partners -- conducting comprehensive wildlife planning and public involvement for nearly forty years. The Maine Dept. of Inland Fisheries and Wildlife (MDIFW) began assembling a SWAP coordination team in January 2014. This planning team developed the strategies necessary to achieve the eight required elements of the 2015 SWAP. In September 2014, the Coordination Team established a SWAP Steering Committee to guide the overall development of the SWAP. The Steering Committee represented the broader partner group by providing regular and timely input into the activities and proposed strategies of the Coordination Team. The Coordination Team and the Steering Committee began preparing Maine's charter early in the update; the Steering Committee officially adopted the charter in November 2014. The Coordination Team invited 158 conservation partners to participate in the preparation of Maine's 2015 SWAP, representing 102 unique organizations and the public from July 2014 – June 2015 the partners attended five, seven-hour "conservation partner" meetings at which they collaborated in the development of elements 1-5 of the 2015 SWAP.

MDIFW sought to both inform the public of its intent to revise the Action Plan and to encourage public participation. It established a Public Outreach Subcommittee to guide its public participation efforts. The subcommittee identified effective methods for engaging and soliciting input from the public, and the Coordination Team and Steering Committee scaled these methods to make effective use of agency resources and ensure an appropriate level of public participation.

The success of Maine's 2015 Wildlife Action Plan depends on continued partner and public engagement during plan implementation. To help guide implementation of these actions and to encourage continued public involvement, MDIFW and its partners developed six outreach

Programmatic Theme that relate to 1. Outreach and Engagement and 2. Program Funding and Tracking.

Differences from Maine's 2005 Comprehensive Wildlife Conservation Strategy are discussed.

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INTRODUCTION

WELCOME TO MAINE

Located at the northeast tip of the United States, the State of Maine is approximately 320 miles long and 210 miles wide and is about halfway between the equator and the North Pole. It is a unique state in that it is almost as large (33,315 square miles) as all other New England states combined, with a human population of approximately 1.33 million or about 40 people per square mile.

Maine is a land rich in contrasts between the boreal and temperate, freshwater and saltwater, upland and wetland, and alpine and lowlands. The state has enormous natural variety and owes its biological wealth to its 17.5 million acres of vast forests, rugged mountains, more than 5,600 lakes and ponds, 5,000,000 acres of wetlands, 31,800 miles of rivers and streams, 4,100 miles of bold coastline, and 4,613 coastal islands and ledges (Brandes 2001, Gawler et al. 1996). Maine is the most heavily forested state in the nation, but also contains some of the most significant grassland and agricultural lands in the Northeast.

This mosaic of diverse physical settings supports a wide diversity of wildlife that can be equaled in few other states. Maine has the largest population of Bald Eagles in the Northeast. The state's islands support one of the most diverse nesting seabird populations on the East Coast, including habitat for rare species such as the Roseate and Arctic Tern, Atlantic Puffin, and Razorbill Auk. Maine's largely clean, free-flowing rivers sustain some of the best remaining populations of rare freshwater mussels and dragonflies in the East, host globally rare endemics, such as the Tomah Mayfly (*Siphonisca aerodromia*) and Roaring Brook Mayfly (*Epeorus frisoni*), and support the listed Atlantic Salmon DPS (Distinct Population Segment) (*Salmo salar*) found in eight mid-coast and downeast rivers. Maine's mountains and forested habitats contribute significantly to the global breeding habitat of neotropical migrants such as Bicknell's Thrush and Blackthroated-blue Warbler. The state has some of the best examples of Pitch Pine-Scrub Oak forest remaining in New England, hosting a suite of globally rare plants and invertebrates.

Maine is a transition area, and its wildlife resources represent a blending of species that are at or approaching the northern or southern limit of their ranges. The species most familiar to us – birds (292 species), non-marine mammals (61 species), reptiles (20 species), amphibians (18 species), inland fish (56 species), and marine species (313 – chordates, fishes, and mammals) – actually comprise less than two percent of the known

wildlife species in the state. Over 16,000 species of invertebrates, 2,100 species of plants, 310 species of phytoplankton, 271 species of macrophytes, and 3,500 species of fungi have been documented, but experts believe many times these numbers actually exist (McCollough et al. 2003, D. Gilbert pers. Comm.). This impressive array of flora and fauna is particularly impressive when one considers that only a handful of species were present just 15,000 years ago when a mile-high sheet of ice covered the state.

Fish and wildlife play an important role in the lives of Maine people as they provide a source of enjoyment, recreation, and employment. Maine's quality of life, its traditional "outdoor" values, and its economy, particularly its rural economy, are strongly shaped by the diversity and abundance of its fish and wildlife. The Maine Dept. of Inland Fisheries and Wildlife (MDIFW) and the Maine Dept. of Marine Resources (MDMR) are the state agencies in which the public has entrusted its concern for Maine's fish and wildlife.

STATE AUTHORITY FOR WILDLIFE AND FISHERIES MANAGEMENT

MDMR functions to conserve and develop marine and estuarine resources; to conduct and sponsor scientific research; to promote and develop the Maine coastal fishing industries; to advise and cooperate with local, state, and federal officials concerning activities in coastal waters; and to implement, administer, and enforce the laws and regulations necessary for these purposes. It is responsible for the management of Maine's marine resources from the high-water mark out to three nautical miles. Management responsibilities are shared with the state legislature and the Department of Marine Resources Advisory Council (15 representatives from coastal fishing industries who are appointed by the governor and subject to legislative confirmation). The legislature directs development of state policy, and through the Joint Standing Committee on Marine Resources, oversees legislation regarding the conservation and development of marine resources. Depending on a number of factors associated with marine species (e.g., geographic distribution of the species), primary management responsibility may also rest at the interstate or federal level.

MDIFW is responsible for the stewardship of Maine's inland fisheries and wildlife resources. MDIFW conducts its management programs under the guidance of the legislature's Joint Standing Committee on Inland Fisheries and Wildlife and with the advice and consent of the Fish and Wildlife Advisory Council, a ten-member citizen's advisory group whose members are appointed by the governor and subject to legislative confirmation. Primary management responsibility may also rest at the federal level, e.g., the management of migratory birds.

Maine has had laws protecting its fish and wildlife since 1830. This early enforcement effort was the birth of the MDIFW (then Department of Inland Fisheries and Game). Although MDIFW's mission has always included protection of species not pursued for

food or sport, there has been a continual shift in its focus from that of a state agency concerned mostly with the administration of laws dealing with hunting and fishing to one with considerable responsibility for the conservation and enhancement of all the inland fisheries and wildlife resources of the state.

During the 1970s, the Maine Legislature enacted several laws that clearly broadened the MDIFW's functions. The name of the department was changed from Inland Fisheries and Game to Inland Fisheries and Wildlife. The legislature enacted laws pertaining to endangered species and nongame wildlife, which clearly established that the agency was expected to protect, maintain, and enhance all fish and wildlife species in the state, as well as their habitat. Beginning in the early 1990s, MDIFW fully mainstreamed nongame responsibilities throughout MDIFW's Bureau of Resource Management and these are widely integrated into MDIFW's work program.

THE STATE WILDLIFE GRANT PROGRAM

As the responsibilities of MDIFW have evolved over time so has the method of funding fish and wildlife conservation and management activities. Prior to its formal establishment as an agency and funding with state appropriations, money received from fines funded fish and wildlife law enforcement. For more than seventy years, MDIFW like other state fish and wildlife agencies, has benefited from funds generated by the Federal Aid in Wildlife Restoration Act (Pittman-Robertson) and the Federal Aid in Sport Fish Restoration Act (Dingell-Johnson) to fund conservation and management of game fish and wildlife species. These funds, collected through federal excise taxes on firearms, ammunition, fishing equipment and tackle, have been critical to conserving game species and their habitat and have provided numerous secondary benefits to nongame species as well.

MDMR has fulfilled its charge to conserve and develop marine and estuarine resources and to conduct and sponsor scientific research through support from changing funding sources over the years. Since 1984, the MDMR has completed projects through the USFWS Wildlife and Sport Fish Restoration Program (Wallop-Breaux). With the Federal Endangered Species Act listing of some marine species, work has been completed with the aid of NOAA Species Recovery Grants to States (Endangered Species Act, Section 6). Past programs, like the Species of Concern Grant Program, have enabled the MDMR to advance research of non-listed species such as rainbow smelt. These opportunities have provided the necessary funds for the agency to complete work on non-commercial species, however, work focusing on many species of conservation need have not been eligible for these programs as they are not federally listed or do not support recreational fisheries.

At the state level, stable and secure financial support for nongame and Endangered wildlife and fishes has not developed for MDIFW or MDMR. The legislature enacted a

voluntary income tax donation (Endangered and Nongame Wildlife Fund, Chickadee Check-off), a conservation registration plate (Loon Plate), a sportsman's registration plate, and a special lottery ticket (Outdoor Heritage Fund) to support new programs, yet funding has been inconsistent and in many instances has declined. Federal funding for Threatened and Endangered species (Section 6 funds under the Endangered Species Act) has been limited, and there was no reliable funding for nongame species.

Recognizing this broad need, Congress created the Wildlife Conservation and Restoration Program (WCRP) in 2001 and the State Wildlife Grant Program (SWG) in 2002. The purpose of the State Wildlife Grant Program is to help state and tribal fish and wildlife agencies address conservation of fish and wildlife Species of Greatest Conservation Need (SGCN). Funds appropriated under the SWG program are allocated to states according to a formula that takes into account each state's size and population.

To be eligible to participate in the SWG program, Congress required each of the 56 states and territories to develop a statewide Comprehensive Wildlife Conservation Strategy (CWCS), now formally known as a State Wildlife Action Plan (SWAP). Action Plans provide a foundation for the future of wildlife conservation and a stimulus to engage states and federal agencies and other conservation partners to think strategically about their individual and coordinated roles in prioritizing and accomplishing conservation actions. In 2005, states and territories submitted their first round of CWCS's to the U.S Fish and Wildlife Service (USFWS) for review.

The USFWS approved Maine's 2005 CWCS (SWAP), and during the decade that followed, Maine has received approximately \$8 million in SWG funds. Projects undertaken with SWG funds have involved many species groups, all geographic areas of the state, and have ranged in scale from ecosystems to subspecies. Projects have varied in length from one to five years, and included baseline surveys and inventories, research, and habitat conservation. SWG funds also support 10 full time positions within MDIFW. The SWG program has significantly advanced the conservation of Maine's SGCN, and continues to play a critical role in keeping many of these species from being listed as Threatened or Endangered. (See Appendix 1. for information on specific projects completed.)

ROADMAP TO THE EIGHT ELEMENTS

Congress identified eight required elements to be addresses in each State's SWAP (Teaming With Wildlife Committee 2003). Congress also directed that strategies identify and focus on "species of greatest conservation need", yet address the "full array of wildlife" and wildlife-related issues keeping common species common. Wildlife Action Plans must address these 8 elements:

1. Information on the distribution and abundance of species of wildlife, including low and declining populations as the State fish and wildlife agency deems appropriate, that are indicative of the diversity and health of the State's wildlife;
2. Descriptions of locations and relative condition of key habitats and community types essential to conservation of species identified in (1);
3. Descriptions of problems that may adversely affect species identified in (1) or their habitats, and priority research and survey efforts needed to identify factors that may assist in restoration and improved conservation of these species and habitats;
4. Descriptions of conservation actions proposed to conserve the identified species and habitats and priorities for implementing such actions;
5. Proposed plans for monitoring of species identified in (1) and their habitats, for monitoring the effectiveness of the conservation actions proposed in (4), and for adapting these conservation actions to respond appropriately to new information or changing conditions;
6. Descriptions of procedures to review the strategy at intervals not to exceed 10 years;
7. Plans for coordinating the development, implementation, review, and revision of the plan with Federal, State, and local agencies and Indian tribes that manage significant land and water areas within the State or administer programs that significantly affect the conservation of identified species and habitats, and
8. Provide an opportunity for public participation in the development of the Wildlife Action Plan.

Congress affirmed through this legislation that broad public participation is an essential element of developing and implementing these plans.

MDIFW is leading the effort to develop Maine's action plan. The goal is to create a vision for conserving the state's wildlife, not just developing an agency plan. While each state's strategy will reflect a different set of issues, management needs, and priorities, states are working together to ensure nationwide consistency and a common focus. (Association of Fish and Wildlife Agencies 2012, Crisfield et al. 2013)

To facilitate review of Maine's Action Plan, each of the eight required elements are addressed in separate chapters: elements 1, 2, 3, and 4 each have a unique chapter; we have combined elements 5 and 6 and also 7 and 8 into a single chapter because of their close relationships.

THE VALUE OF MAINE'S WILDLIFE ACTION PLAN

The value of this Maine's Wildlife Action Plan extends far beyond the requirements of the State Wildlife Grant program and beyond the missions of MDIFW and MDMR. It is an opportunity and challenge for both agencies and their conservation partners to provide effective and visionary leadership in the conservation of all the state's wildlife. Maine's Action Plan is intended to supplement, not duplicate, existing fish and wildlife programs and to target species in greatest need of conservation - species that are indicative of the diversity and health of wildlife in the state - while keeping "common species common."

The Plan addresses the full array of wildlife and their habitats in Maine -- vertebrates and invertebrates in terrestrial and aquatic (freshwater, estuarine, and marine) habitats – and wildlife is defined as any species of wild, free-ranging fauna including fish. It builds on a long history of public involvement and collaboration among conservation partners. It is meant to be dynamic, responsive, and adaptive. Hence, Maine's Action Plan serves as a solid foundation for the future of wildlife conservation that will help guide the collaborative efforts of state and federal agencies, tribes, conservation partners, and individuals to ensure success.

List of Acronyms

CWCS	Comprehensive Wildlife Conservation Strategy
DPS	(Salmon) Distinct Population Segment
MDIFW	Maine Dept. of Inland Fisheries and Wildlife
MDMR	Maine Dept. of Marine Resources
SGCN	Species of Greatest Conservation Need
SWAP	State Wildlife Action Plan
SWG	State Wildlife Grants (Program)
USFWS	U.S Fish and Wildlife Service
WCRP	Wildlife Conservation and Restoration Program

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Appendices

Appendix 1: Maine's State Wildlife Grants Program: 10 Years of Enhanced Wildlife Conservation

Appendix 1:

Maine's State Wildlife Grants Program: 10 Years of Enhanced Wildlife Conservation

Congress instituted the State Wildlife Grant [SWG] program in 2001. State Wildlife Grants provide wildlife conservation funds to the 50 states. The states use the grants for the development and implementation of management programs that benefit wildlife and their habitat, including species that are not hunted or fished. To receive SWG funding, Maine must have a State Wildlife Action Plan. The U.S. Fish & Wildlife Service [USFWS] approved Maine's wildlife action plan in the summer of 2005. The plan identified species and habitats in greatest conservation need, significant threats to wildlife and habitat, and the conservation actions needed to prevent endangered species listing and to spur the recovery of endangered species.

<http://www.maine.gov/ifw/wildlife/reports/wap.html>

Maine's 2005 Wildlife Action Plan is supported by two pillars. The first is wildlife conservation planning. Where adequate knowledge exists, the Maine Dept. of Inland Fisheries & Wildlife [MDIFW] and its conservation partners are able to develop species-specific management goals and objectives that lead to direct conservation actions. Where knowledge is inadequate, MDIFW must undertake survey, monitoring, and research.

MDIFW has directed significant portions of SWG funding toward the monitoring, survey, and research required to fill knowledge gaps and to the development and maintenance of databases. Collected information must be accessible and stored in a logical format; and so, the construction and maintenance of databases is an extension of information gathering. Both are essential to species planning.

The second pillar is the various efforts of MDIFW and its conservation partners to conserve natural communities and habitat for wildlife and plants. *Beginning with Habitat* is Maine's premier habitat conservation outreach program. The knowledge gained during monitoring, survey, and research is often sufficient to guide on-the-ground habitat conservation efforts, such as *Beginning with Habitat*. This is an important aspect of information gathering that is often overlooked.



Other conservation actions supported by information gathering include “focused” land acquisition, conservation easements, and cooperative habitat management agreements; environmental permit review; oil-spill preparedness and response, and responding to landowner inquiries for habitat information.

MDIFW also reviews the data gathered during monitoring, survey, and research to assess the status of wildlife populations and to determine appropriate conservation designations, such as the Species of Greatest Conservation Need [SGCN] list, which is basis for Maine’s wildlife action plan.

The SWG program requires that Maine update its wildlife action plan by October 2015. Ten years have passed since the state's conservation partners and MDIFW prepared Maine's first plan. Together, we have accomplished much for wildlife; and with your help, we hope to continue this success into the future. Maine's traditional "outdoor" values and its rural economy depend upon thriving wildlife populations. We know more remains to be accomplished. Continued habitat loss and fragmentation and the specter of a changing climate present a challenge to much that we value. Over the next 18 months, MDIFW, its conservation partners, and the public will update and revise Maine’s wildlife action plan. As we begin this process, we thought it would be helpful to review the accomplishments of the past decade.

STATE WILDLIFE GRANT ACCOMPLISHMENTS

BEGINNING WITH HABITAT

Beginning with Habitat: The premise of *Beginning with Habitat* [BwH] is that local planning undertaken with the knowledge of local natural resources will allow Maine’s towns and cities to grow and develop and conserve open space for fish, wildlife, and plant habitat. BwH provides habitat maps and assistance with open-space planning to municipalities, land trusts, and landowners. Its success depends upon voluntary land conservation efforts by landowners, particularly private landowners. BwH used SWG funds to compile data on water resources, riparian habitats, high value plant and animal habitats, focus areas of statewide ecological significance, undeveloped habitat blocks, and habitat connections. BwH made these data available in both printed and digital formats, including an interactive, on-line map service. BwH has assisted numerous regional conservation planning initiatives across Maine and more than 175 towns engaged in comprehensive or conservation planning. Recently, the program completed a climate change vulnerability assessment that is informing sea level rise adaptation plans

in several communities and also the 2015 update of Maine's wildlife action plan.
<http://www.beginningwithhabitat.com>

SURVEY, INVENTORY, AND MONITORING

Ecoregional Surveys: From 1997-2007, MDIFW and the Maine Natural Areas Program [MNAP] conducted a systematic, statewide, ten-year survey on 9.7 million acres of wildlife habitats. The survey documented rare species status and distribution, and with this information, MDIFW developed conservation strategies for rare species, including Canada lynx, bats, small mammals, marsh birds, Bicknell's thrush, Louisiana waterthrush, peregrine falcons, golden eagles, timber rattlesnakes, rare mayflies, freshwater mussels, White Mountain tiger beetles, spring salamander, Clayton's copper butterfly, and rare butterflies, damselflies and dragonflies, among other species.

The Lake Habitat Inventory Program: SWG funds supported habitat surveys of the aquatic resources found in lakes and ponds. MDIFW staff surveyed approximately 3,800 ponds that had never been inventoried and also many waters with outdated surveys. MDIFW used SWG funding to conduct new pond surveys, wild brook trout pond surveys, hydroacoustic surveys to monitor forage fish populations, a lake trout spawning survey, a catchable trout study, lake contour mapping, a round whitefish telemetry study, winter creel surveys, management of illegally introduced fish populations, and sampling of white perch populations. The program updated and maintained the lake inventory database and the regulation database.

Status of the brook floater in Midcoast and central Maine: In 2009, a survey of state-threatened brook floaters in the Pleasant River revealed that a significant decline in numbers and habitat quality had occurred since biologists last visited the site in 2001. MDIFW used SWG funding to survey the Pleasant and Sheepscot rivers and document the brook floater's distribution, population size and density, demographics, shell condition, habitat quality, and threats. Surveys confirmed the species' presence and distribution in these two rivers.

Status of the brook floater in the Denny's and Sandy Rivers and Allen Stream: Biologists suspected the presence of the brook floater in the Denny's River, Sandy River, and Allen Stream for several years. MDIFW used SWG funds to conduct surveys in all three to document the brook floater's presence or absence, and if present, its distribution, population size and density, demographics, shell condition, habitat quality, and threats. The surveys did not find the species in the Sandy River; found one individual, despite several days of searching, in the Denny's



River; and found a viable population in Allen Stream.

Maine Butterfly Atlas: MDIFW currently recognizes 15 butterflies as SGCN. Many more require further assessment before MDIFW can assign conservation status. SWG funds supported the Maine Butterfly Atlas project, which documented the status and distribution of butterflies and assessed habitat conservation priorities. Professional and citizen scientists submitted thousands of Maine butterfly records, raising public awareness and concern for butterflies.



Status of the spicebush swallowtail butterfly in Maine: This butterfly reaches its most northeastern distribution in east-central New England, where the butterfly larvae's rare host plants – sassafras and spicebush – also reach the northern edge of their range. The spicebush swallowtail inhabits a hardwood forest type that is threatened by habitat loss and fragmentation in the rapidly developing landscape of southern Maine. MDIFW used SWG funding to survey 28 high-priority host plant sites

during the butterfly's larval stage and documented spicebush swallowtail larvae at 15 localities in York County. MDIFW entered and mapped these new observations in MDIFW's Endangered, Threatened, and Special Concern (ETSC) species database.

Status of the ringed boghaunter dragonfly in Maine: Biologists first discovered the ringed boghaunter dragonfly in Maine in 1995, but subsequent surveys have produced only ten confirmed breeding populations of this wetland species in York and southern Oxford counties. MDIFW used SWG funds to conduct boghaunter surveys and to monitor the dragonfly's seasonal emergence. MDIFW plans additional surveys for 2014.

Cobblestone tiger beetle conservation in Maine: mapping standards and environmental review protocols: In 2009, MDIFW biologists working on the ecoregional survey in the central and western mountains discovered Maine's first record of the cobblestone tiger beetle. Historically this species was likely found throughout the northeast, but due to habitat loss it is limited to a few free-flowing rivers. The newly discovered Maine population filled a distribution gap. MDIFW conducted surveys for the cobblestone tiger beetle from 2007-2012. It used SWG funds to synthesize survey data and to develop habitat mapping and ranking protocols, environmental review guidelines, and a factsheet for the beetle.

River surveys and analysis of wood turtle populations in Maine: Wood turtles are widely distributed, but localized and uncommon in Maine. They are considered a species of special concern due to habitat fragmentation and degradation, collisions with agricultural machinery and cars, and illegal collection for the pet trade. MDIFW funded wood turtle

surveys along Maine’s rivers to determine its status. The survey produced observation records.

Northern black racer conservation in Maine: mapping standards and environmental review protocols: At present, less than 30 sites in Maine are known to host black racers, and less than six locations have persisting populations. The racer has a high risk of extirpation in Maine due to rarity at the northern edge of its range and habitat loss and fragmentation. MDIFW conducted surveys for the northern black racer from 2007-2012. It used SWG funds to review and synthesize survey data and to develop habitat mapping and ranking protocols, environmental review guidelines, and a factsheet for the black racer.



Timber rattlesnake habitat surveys: No rattlesnake sightings have been documented in Maine for over 100 years, but MDIFW receives many unconfirmed reports almost annually. The majority of these are misidentifications; nevertheless, some are suggestive. Biologists concluded that further investigation of the rattlesnake’s status was warranted due to its ability to remain undetected and to survive in fragmented landscapes. MDIFW funded multiple spring and fall surveys of potential mountain outcrop hibernacula. Although biologists observed no rattlesnakes, it appears that suitable habitat is still available over much of its historic Maine range.

New England cottontail: Maine listed the New England cottontail as an endangered species in 2007. MDIFW used SWG funds to support the salary of Maine’s New England cottontail restoration coordinator; conduct research on the geographic structure and landscape connectivity of New England cottontail populations; monitor the effectiveness of conservation actions; develop noninvasive genetic monitoring technique for population estimation; and develop a pellet count index.

Bald eagle monitoring and habitat conservation: Bald eagles continue their dramatic comeback. Presently, Maine is home to more than 630 nesting pairs, a remarkable increase from 30 nesting pairs in the mid-1970s. In order to minimize risks due to relentless pressures of land development and recreational disturbances on suitable nesting habitat (mature trees and wooded buffers in shorelands) MDIFW devised a statewide, long-term strategy for nesting habitat conservation. With support from SWG, survey emphasis shifted to guide and test the efficacy of those efforts. The following chart summarizes overall progress through the first 10 years of the SWG program in Maine:

Year	# Nesting Pairs	# Conserved Territories	#Partially Conserved Territories
2013	631	152	307

2008	477	97	220
2003	310	80	

MDIFW has not expended SWG funds to purchase lands or easements for eagle nesting habitat, but partnered with > 50 land trusts to leverage projects of mutual interest. Periodic aerial surveys conducted by MDIFW not only track species recovery and safeguards, but provide the support for research by partners on subjects ranging from contaminant studies, productivity monitoring, habitat use and movement studies via telemetry, and identification of eagle foraging aggregations.

Peregrine falcon monitoring: Ground-based surveys are necessary to monitor peregrine nesting activity. MDIFW used SWG funds to survey 11 eyries in 2013, producing observations of eight resident pairs and fledglings at four locations. MDIFW opportunistically banded three nestlings at the Casco Bay Bridge in Portland the same year.

Status and monitoring of Maine owls: For several years, Maine Audubon and MDIFW worked in partnership with a group of more than 200 volunteers to survey owl populations. In 2002-2003, the partners conducted a two-year project to investigate new, volunteer-based survey approaches to more effectively evaluate the status and distribution of owls. MDIFW used SWG funds to complete data entry from this program, improve the efficiency of future surveys, and report the new monitoring approach to volunteers.

Piping plover and least tern management to monitor the effectiveness of predator control techniques: Piping plovers and least terns are Maine endangered species. They nest along the southern coast and require sand beaches free from human disturbance and predators to raise young successfully. SWG funding enabled MDIFW, working in cooperation with the Maine Audubon Society, to gather data necessary for the management of piping plovers and least terns, including the development of cooperative beach management agreements with municipalities.



Enhancing shorebird conservation in Casco Bay: Casco Bay supports several SGCN shorebirds; however, nearly 25% of Maine residents live within the Casco Bay watershed. Thus, shorebirds are confronted with habitat degradation from development, human disturbance, and contaminants. SWG funds supported a collaborative effort to develop a shorebird monitoring program in Casco Bay to determine shorebird trends and inform adaptive management.

Survey and mapping of important shorebird habitats: Arctic breeding populations of shorebirds have declined by as much as 50% over the past three decades. Habitat loss and degradation along migration routes and in wintering areas are major factors. The Gulf of Maine is a major flyway for many species of shorebirds. Its tidal mud flats provide a significant source of food that is critical to shorebird survival during their fall migration, which is thought to pose the greatest threat to annual survival. Understanding shorebird movements as they migrate through the Gulf of Maine is necessary to identify and preserve important stopover sites. SWG funding has supported shorebird tagging and tracking to determine important feeding areas and offshore roosts, which can subsequently be identified for conservation.

Enhancing the value of shorebird migration monitoring in Maine: Both the U.S. and Canada have identified the need for consistent monitoring of migratory shorebirds. Consequently, MDIFW participated in the development of a sampling plan that is compatible with existing survey protocols and data needs. SWG funds supported a volunteer coordinator to conduct surveys and recruit volunteers. MDIFW submitted survey results to the larger multi-agency program, and Maine will be a part of the long-term monitoring program. The project will improve the conservation of migratory shorebirds by estimating and monitoring population sizes, trends and causes for population declines.

Purple sandpiper research data analysis to identify important wintering areas: The U.S. Shorebird Conservation Council recognized the northeast Atlantic coast as an area important to the survival of wintering purple sandpipers in the Western Hemisphere. Maine supports a large percentage of the wintering population of these sandpipers. MDIFW used SWG funds to estimate abundance and distribution of purple sandpipers, assess movements and site fidelity of individuals at particular sites, and develop a protocol for monitoring purple sandpiper populations.

Development of a Maine seabird atlas: SWG funds allowed MDIFW to compile and publish the *Maine Atlas of Breeding Seabird and Coastal Wading Bird Colonies 1960 – 2011*. The atlas allows readers to quickly find information on specific seabird colonies or colonies in a particular region of the coast. The atlas includes colony name, Maine Coastal Island Registry number, survey date, observers, survey type, and an estimate of the number of breeding birds.

Inland-nesting seabird surveys: Small numbers of common terns nest on rocky islands in a few large freshwater lakes in northern and eastern Maine; however, their abundance and distribution is poorly understood. MDIFW used SWG funds to survey breeding activity by common terns at Portage Lake and at Long Lake in St. Agatha.

Monitoring roseate tern nesting activity on Maine islands managed by the National Audubon Society: In the Northeast, the federally-endangered nesting population of

roseate terns is the focus of broad research. Audubon received SWG funds to conduct nest counts, productivity and growth studies, chick diet studies, and adult mark-recapture studies. Staff also constructed artificial nest boxes and shelters on Stratton Island; roseate terns used many of these throughout the chick-rearing period.

Island nesting tern and great cormorant monitoring in outer Penobscot and Jericho bays: In 2008, MDIFW used SWG funding to conduct a series of nest surveys for island-nesting terns and great cormorants off the coast of Maine. Staff conducted follow-up surveys in July and August to determine the number of fledglings.

Black tern surveys: Black terns nest in large, shallow, emergent marshes associated with lakes, impoundments, and slow-moving streams. Habitat loss and degradation on the breeding grounds are major contributors to the decline of black terns. Eighteen Maine wetlands have supported breeding black terns, and MDIFW has monitored these known breeding sites since 1989 to determine population status and trends. SWG-funded surveys during 2012-2013 determined that black tern numbers were down to 67 pairs in 2013 from 102 pairs in 2012.

Black tern and inland-nesting seabird surveys at historic breeding sites: Students from Nakomis Regional High School in Newport have conducted black tern surveys at breeding sites for many years. They also collect information about common terns, double-crested cormorants, Bonaparte's gulls, and ring-billed gulls. SWG funds have supported this initiative.

Aerial survey of common loons in northern and Downeast Maine: Common loons are widely distributed across Maine, but are negatively impacted by shoreline development, boating, and lead ingestion. MDIFW used SWG funds to aerially survey approximately 100 lakes in northern and Downeast Maine, where loon surveys had not been conducted since 1996, to assess loon distribution and population trend data.

Aerial census of nesting great blue herons and other colonial wading birds: SWG funds have supported aerial surveys of more than 180 historic great blue heron nesting locations. MDIFW discovered 73 new sites during the surveys or as a result of information provided by the public or other biologists. MDIFW visited 38 colonies to verify locations and to count active nests. Additional on-the-ground efforts included surveys of two coastal islands for nesting black-crowned night-herons, a threatened species. MDIFW also initiated an adopt-a-colony program, called the Heron Observation Network (HERON) that enlists volunteers to monitor wading bird colonies. HERON identified nearly 40 new colonies.

Harlequin duck and purple sandpiper surveys in Outer Penobscot, Jericho, Blue Hill, and Frenchman's bays: More than 90% of Maine's wintering population of harlequin ducks is located at offshore ledges in Midcoast Maine. The Midcoast is also an important wintering area for purple sandpipers, which can be surveyed simultaneously with harlequins. MDIFW used SWG funds to support an annual boat survey of the wintering area to monitor changes in abundance and distribution of harlequin ducks and purple sandpipers.

Systematic surveys to determine the winter distribution of Barrow's goldeneye. Barrow's goldeneyes exhibit strong site fidelity to wintering areas, returning annually to the same open-water sites along the coast between Eastport and Kittery and between the Penobscot and Kennebec rivers. Systematic surveys of these sites are an efficient way to monitor distribution and population trends. MDIFW conducted surveys in 1999-2000 and repeated these surveys in 2008-2009. The number of Barrow's goldeneye detected in 2008-2009 was 27% lower than the number in 1999-2000.

Conserving grassland birds in Maine: a comprehensive field survey for declining species in southern Maine: From 1997-1998, MDIFW surveyed nearly 300 grasslands and barrens to assess the presence of grassland birds. Following field surveys, the Department used GIS to map the extent of grassland habitat around the original survey sites. SWG funding allowed MDIFW to revisit many of the sites, adding additional survey points to better characterize grassland bird communities. Furthermore, MDIFW identified additional sites not previously surveyed to broaden the survey's scope and expanded its intensity in six counties.

DATABASE DEVELOPMENT AND MAINTENANCE

Data conversion and management: This project converted data currently housed in the Biological Conservation Data System to the Biotics data management system. Following standard Heritage methodology, MDIFW used SWG funding to collect, transcribe, map, and process data on rare, threatened, and endangered animals, entering 257 records into Biotics. MDIFW provided data to NatureServe and The Nature Conservancy for biodiversity assessments. SWG funds also supported the development of MDIFW's Endangered, Threatened, and Special Concern (ETSC) relational database. This system stores tabular observation data in Microsoft Access, which is linked to observation points and mapped habitat areas stored in a geodatabase. The system was designed specifically to meet MDIFW's needs, especially for environmental reviews. It currently contains >6,500 observations.

Maine Aquatic Biodiversity Project: This project used SWG funds to compile freshwater biodiversity data on fish, macro-invertebrates, amphibians, reptiles, and aquatic plants into a centralized database containing over 200,000 geo-referenced records from across the state. It analyzed and synthesized these data to develop summaries of species distributions, patterns of species richness, associations among biodiversity and landscape-level variables, evaluation of data gaps, and an overview of key threats and stressors to freshwater ecosystem. The project re-designed and upgraded the University of Maine's PEARL website to accommodate stream, wetland, and terrestrial data, providing on-line access to aquatic biodiversity data.

Stream survey database: MDIFW possesses extensive information on physical and biological stream characteristics; however, these data were in multiple formats and storage locations. MDIFW used SWG funding to compile existing stream habitat and fish community data into a GIS for easier use, analysis, and visualization. This project included field assessments of streams, the creation of a database to manage stream survey data, and the development of a reporting system that summarizes and displays data in a format useful to fishery managers. MDIFW also compiled a guide to Maine's freshwater fish, created the Maine Stream Index, and conducted statewide mapping of 'likely brook trout habitat.' Ultimately, these efforts allow fisheries biologists to identify completed and future survey efforts.

Data entry and database management for Maine's rare, threatened, and endangered reptiles, amphibians, and invertebrates: MDIFW used SWG funding to update the ETSC database by transcribing and entering recent and historic field notes and creating corresponding point locations in GIS.

Northeast Amphibian and Reptile Atlas: MDIFW used SWG funds to enter nearly 1,200 reptile and amphibian records into the ETSC database. Additionally, it converted information from older, hard-copy reports to digital format and scanned and catalogued original documentation photographs. MDIFW contacted various museums in the Northeast to request confirmation of Maine specimens possessed and their catalog numbers. From the museum reports, the project gathered new records and updates for Blanding's turtle, spotted turtle, wood turtle, and northern black racer, all of which are SGCN.

Documenting statewide survey efforts and results for Maine's rare mayflies: Maine has two species of mayflies listed under Maine's Endangered Species Act and more than a dozen species considered Special Concern. Surveys to document the occurrence, distribution, and status of the Tomah mayfly have been ongoing since the late 1970s, when researchers at the University of Maine rediscovered this globally rare insect once thought to be extinct. MDIFW has conducted extensive surveys for both the Tomah

mayfly and Roaring Brook mayfly through its ecoregional survey over the past decade. It has also undertaken limited surveys for several other mayflies. In total, MDIFW has surveyed several hundred sites for rare mayflies. Using SWG funds, MDIFW transcribed its field records and those available from the University of Maine and independent sources into the ETSC database, creating a comprehensive, up-to-date record for these rare mayflies.

Data entry and database management for Maine's rare, threatened, and endangered birds: MDIFW used SWG funding to transcribe field notes and reports into the ETSC database and create corresponding point locations in GIS.

Planning for habitat management on MDIFW lands: Two-thirds of MDIFW's Wildlife Management Areas (WMAs) provide habitat for rare, threatened, or endangered species. MDIFW used SWG funding to develop a statewide WMA database, which provides a summary of habitat types, physical features, stream layers, roads, natural communities, and property boundaries for MDIFW lands. SWG funds also supported the 2006 WMA plan update. Each updated plan contains a schedule of development and maintenance treatments and a schedule of habitat treatments to enhance wildlife diversity.



EDUCATION

Fish and wildlife education: Fish and wildlife conservation education at the elementary school level is important to establish ecological awareness in Maine's citizens. MDIFW used SWG funding to assemble and mail a wildlife-conservation education packet to all 4th grade teachers in Maine. Each packet contained five MDIFW conservation posters, each linked to a Project WILD activity. MDIFW also developed *Critters of Maine* a full-color, 128-page pocket guide to wildlife that conforms to Maine's State Learning Standards. MDIFW mailed 25 booklets to all 4th grade classrooms.

Seabird outreach: MDIFW used SWG funding to teach Maine students and the public about seabird biology and marine conservation. The program provided insight into the lives of Maine seabirds through a web-based school curriculum that featured live video from Eastern Egg Rock, a state-owned, seven-acre sanctuary managed by the National Audubon Society. The outreach effort also developed an interactive CD on tern biology and conservation and distributed them to upper elementary and middle school children.

Swan Island wildlife viewing area: Swan Island is a WMA located in the Kennebec River in the town of Richmond. Swan Island hosts almost 4,000 visitors annually, who come to hike, mountain bike, camp, participate in wildlife and conservation education tours, and photograph and view the abundant island wildlife. MDIFW used SWG funding to erect a wildlife viewing tower on the island and to renovate an existing boathouse to serve as an indoor classroom for its education programs.

RESEARCH

Studies of sea run brook trout in two Maine streams: Understanding the movements of brook trout in coastal streams is necessary to manage this important game fish and for the conservation of Atlantic salmon. This study used SWG funding to characterize brook trout movements in Stanley Brook and Cove Brook, both along the Maine coast. It used passive integrated transponder (PIT) technology to track individual brook trout movement in and out of these two systems; it also conducted stream-habitat surveys to complement life history and movement data. Data from this project contributed to the completion of a Master's of Science thesis at the University of Maine, as well as two peer-reviewed publications.

Lake whitefish: This project identified factors contributing to the decline of Maine's whitefish fishery. It focused research efforts on the relationship between the introduction of certain non-indigenous species, particularly the rainbow smelt, and the subsequent decline of lake whitefish populations. The project used SWG funding to search for information pertinent to competition and predation of rainbow smelt on lake whitefish. It conducted field studies on the movement of sub-adult and adult lake whitefish and potential interactions between lake whitefish and smelt. Next, the project consolidated the data and analyzed population trends for these two populations. Using this information, it developed a model predicting the likelihood of lake whitefish presence, based on physical characteristics of lakes and the presence of other fish species. Over the long term, this project is expected to prevent further decline and initiate the restoration of the lake whitefish sport fishery.

Environmental factors associated with unique lake communities in Maine: Widespread fish stocking has led to a worldwide decline in naturally fishless lakes and their associated communities. Little is known about the historic distribution and the native communities of these freshwater ecosystems. MDIFW has documented at least 30 fishless ponds; many ponds currently with fish are known to have been fishless prior to stocking. SWG funds allowed two University of Maine graduate students to develop a quantitative method to remotely detect naturally fishless lakes in Maine, conduct a landscape-scale assessment of unique attributes of fishless lake macroinvertebrate

communities, identify macroinvertebrate bioindicators of fish absence, and assess effects of introduced fish on native macroinvertebrates. The study determined that stocked lakes supported dramatically reduced macroinvertebrate abundance and species richness than currently fishless lakes. These effects were more pronounced in headwater than kettle lakes, likely due to sparse littoral habitat and intense stocking. Maine's naturally fishless lakes provide habitat for a unique suite of organisms that thrive in the absence of fish predation.



Effects of dam removal and relocation on yellow lampmussels and tidewater mucketts: Dam removal could potentially jeopardize the state-threatened yellow lampmussel and tidewater mucket, as both inhabit impoundments, but the long-term effects were largely unknown. Two Masters' of Science projects used SWG funding to investigate the status and distribution of these mussels, determine habitat selection, and evaluate relocation as a tool to minimize loss. The research indicated that both species are

relatively flexible in their habitat needs and can persist in both flowing water and impounded areas. Therefore, the long-term persistence of the population is more likely limited by threats other than habitat loss, including mortality immediately following dam removal.

Genetic structure of Clayton's copper butterfly metapopulation and assessment of environmental conditions in wetlands with and without Clayton's copper: Investigators first discovered Clayton's copper in Maine and described it as a distinct subspecies in 1940, disjunct and separate from the more widely distributed Dorcas copper. It is currently known from only ten sites in Maine and five just over the border near Woodstock, New Brunswick. Through cooperative efforts with the University of Maine, funded by SWG, MDIFW is using project information to estimate the levels of dispersal and isolation that contribute to butterfly population stability and to develop shrubby cinquefoil habitat management goals, as the butterfly species' obligate host plant. These data also serve as a baseline for future cinquefoil monitoring and provide information for conservation planning and management of this endangered butterfly.

Habitat and distribution of the arrowhead spiketail dragonfly in Maine: The arrowhead spiketail dragonfly is found across much of the eastern U.S., but is generally rare in part due to the highly vulnerable nature of its breeding habitat. This species has been documented at nine sites in Maine, of which only a subset have likely breeding habitat. MDIFW used SWG funds to survey known and potential populations and habitats, characterize known breeding habitat in Maine, and assess the distribution and population status of the dragonfly statewide, including a conservation status recommendation. Researchers confirmed arrowhead spiketail populations at four new sites and located reproductive habitat at another. Analyses are currently in progress at the University of Maine to quantify both local and watershed scale characteristics of breeding habitat.



Blandings turtle road research: The Maine Department of Transportation (MDOT) and MDIFW initiated this project, using SWG funds, to support a University of Maine doctoral student in the development of a predictive model of endangered turtle road mortality rates for specific road segments throughout southern Maine. In addition, it produced a comprehensive review of road conservation mitigation options suitable for endangered turtles in southern Maine and also three peer-reviewed manuscripts advancing the science of turtle-road ecology.



Canada lynx ecology: The U.S. Fish & Wildlife Service [USFWS] listed the Canada Lynx as threatened under the U.S. Endangered Species Act in 2000. Maine is the remaining stronghold for lynx in the east. MDIFW, in cooperation with the USFWS and the University of Maine, has been researching lynx population dynamics, habitat use, interactions with other carnivores, movements, and survey approaches since 1999. This effort has gathered some of the most detailed information on lynx ecology in the lower

48 states. Since 2005, biologists have used SWG to fund a significant portion of this research. Fieldwork has included capturing and fitting adult lynx with VHF and GPS radio collars to monitor survival rates, causes of mortality, reproduction, movements, and habitat use patterns; visiting den sites to determine litter sizes and tag kittens; conducting snow track surveys to assess the abundance of lynx and sympatric carnivores; and monitoring snowshoe hare pellet transects to determine hare density. This project has

resulted in several peer-reviewed publications, guided the development of MDIFW's lynx species assessment, and informed the federal designation of critical habitat for lynx in northern Maine.

Canada lynx diet and impact mitigation: SWG funds supported a Master's of Science student at the University of Maine conducting research on the diet of Canada lynx. The student extracted DNA from "potential" lynx scats and used DNA to discriminate lynx scat from non-lynx species. If the scat sample came from a lynx, the student determined the gender of the animal. This project is ongoing, and will ultimately result in sex-specific evaluation of lynx diets in northern Maine. SWG funds have also been used to mobilize MDIFW wildlife biologists responding to lynx incidentally captured in foothold traps, so that the lynx may be assessed for injury and released unharmed. MDIFW is researching injury levels in relation to environmental factors and trapping techniques under the structured decision-making and adaptive management paradigms.

Risk assessment of saltmarsh passerines to mercury contamination: SWG funds supported a study to determine mercury exposure and assess risk to passerine birds breeding in Maine saltmarshes by determining the levels of mercury in the eggs and blood of tree swallows and saltmarsh sparrows and correlating these observed mercury levels with known impact levels from swallow dosing studies. This research effort concluded that blood is an appropriate tissue to evaluate the mercury exposure to insectivorous, saltmarsh birds and found that saltmarsh sparrows have elevated blood mercury levels across much of the Northeast. Tree swallows had significantly less mercury in blood than saltmarsh sparrows, indicating that aerial foragers, such as swallows, may not best represent mercury risk in estuaries.

Effects of tidal restriction on the breeding ecology of saltmarsh sparrows: Saltmarsh sparrows are migratory songbirds that breed exclusively in saltmarshes along the Atlantic coast. As a result of extensive industrial and urban development, saltmarshes have become increasingly rare. Roads, in particular, are known to restrict natural tidal flow and significantly alter marsh hydrology. Using SWG funding, MDIFW collaborated with the University of Maine to examine how roads crossing tidal marshes affect saltmarsh sparrow reproduction. This project confirmed that nests were more likely to succeed if they were initiated quickly after the lunar high tide flood cycles. In addition, nests located in marshes with tidal restrictions were more vulnerable to inundation from heavy rainfall compared to nests located in unrestricted marshes.

Productivity and dynamics of saltmarsh sparrow populations in a hybrid zone: Saltmarsh and Nelson's sparrows commonly interbreed in an area of range overlap that includes approximately 170 km of the Maine coast. By evaluating hybrid fitness in relation to that of the parents and using microsatellite genotyping to determine the extent and direction of genetic introgression, MDIFW desires to gain a better understanding of the dynamics of the hybrid zone. MDIFW used SWG funding to evaluate the fitness (via nesting

success and survival) of saltmarsh-Nelson's hybrids in comparison to pure individuals. We collected genotypic data from nests containing chicks and their associated mothers to contribute to genetic studies of introgression and range-wide source-sink metapopulation dynamics. MDIFW incorporated the data collected for this project into a larger, collaborative, SWG funded Saltmarsh Habitat and Avian Research Project, contributing to regional analyses and a population model.

Determining the relationship between nest predation of rusty blackbirds and timber management: Rusty blackbirds of the northeastern U.S. have declined by an estimated 80-90% in the last 50 years. Despite increased research on this species, the causes are still unclear. Previous work in Maine indicated that this species may be suffering from an "ecological trap," wherein they preferentially nest in regenerating clear cuts, experiencing higher nest predation and lower nest success than in -uncut areas. SWG funded an investigation of the relationship between habitat, nest site selection, and predation. Analysis is ongoing.



Foraging behavior of razorbills at the southern limit of their range in Maine: Razorbills were extirpated from the Gulf of Maine in the late 1800s, but have recolonized some nesting habitat during the past few decades. There are currently six colonies in Maine, which is the southern edge of this species' breeding distribution. A Master's of Science project at the University of Massachusetts used SWG funds to investigate adult foraging

behavior, chick diet, and reproductive success of razorbills on Matinicus Rock. This project concluded that low prey availability was limiting population growth and that the success of this colony was likely due to immigration from other areas.

RESTORATION

Restoration work to facilitate nesting by terns, Atlantic puffins, and razorbills on Eastern Brothers Island: Eastern Brothers Island has historically served as an important nesting area for several sea bird species, but a variety of factors have recently resulted in low nesting activity. SWG funded several management actions to improve the attractiveness and security of Eastern Brothers Islands for nesting seabirds. These included placement of puffin and razorbill decoys, a sound system to imitate the sounds of an active tern colony, and active hazing to discourage gulls from nesting on the island.

BACKGROUND

Congress instituted the State Wildlife Grant program in 2001 via H.R. 2217, the Dept. of Interior and Related Agencies Appropriations Act, 2002, enacting the State and Tribal Wildlife Grants Program. This act provides wildlife conservation grants to U.S. States, the District of Columbia, and the territories of Puerto Rico, the U.S. Virgin Islands, the Northern Mariana Islands, American Samoa, and to federally-recognized Indian tribes. SWG supports the development and implementation of management programs that benefit wildlife and their habitat, including species that are not hunted or fished. Funds appropriated under the SWG program are allocated to states according to a formula that takes into account each state's size and population.

To qualify for SWG funding, Maine must have a comprehensive wildlife conservation strategy, also known as the State Wildlife Action Plan. Maine submitted its first wildlife action plan to the USFWS in the summer of 2005. The plan identified species and habitats in greatest conservation need, including 213 SGCN; key threats to wildlife and habitat; and conservation actions needed to prevent endangered species listing or to spur recovery. <http://www.maine.gov/ifw/wildlife/reports/wap.html>

Since 2005, Maine has received \$7,962,737 in SWG funds, of which \$2,366,855 (30%) has been directed towards salaries. Projects have involved many species groups, all geographic areas of the state, and have ranged in scale from ecosystems to subspecies. Projects have varied in length from one year to five years and included baseline surveys and inventories, research, and habitat conservation. SWG funds support the equivalent of ten full-time positions at MDIFW.

The provisions of the SWG program require that each state update its wildlife action plan every 10 years. Maine's update is due in October 2015.

State Wildlife Grants are administered under the provision of the Fish & Wildlife Act of 1956 and the Fish & Wildlife Coordination Act.

Table 1-3. Maine's SGCN (by taxa class) and qualifying factors. Click on a species name to launch a full SGCN report summarizing associated habitats, stressors, and conservation strategies for that species.

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
ACTINOPTERYGII (ray-finned fishes; N = 33)							
Acipenseriformes (sturgeons and paddlefishes; N = 2)							
Acipenser brevirostrum Shortnose sturgeon	1	1	E	yes	E	VU	
Acipenser oxyrinchus Atlantic sturgeon	1	1		yes	T		culturally significant
Anguilliformes (true eels; N = 1)							
Anguilla rostrata American Eel	1	2	SC	yes			recent significant decline, culturally significant
Clupeiformes (herrings; N = 3)							
Alosa aestivalis Blueback Herring	no	1		yes	SoC	VU	recent significant decline, culturally significant
Alosa pseudoharengus Alewife	no	2		yes	SoC		recent significant decline, culturally significant
Alosa sapidissima American Shad	2	1		yes			understudied taxa, recent significant declines, culturally significant
Cypriniformes (carps, minnows, loaches and allies; N = 7)							
Catostomus catostomus Longnose Sucker	2	3					understudied taxa
Erimyzon oblongus Creek Chubsucker	no	3	SC				understudied taxa
Hybognathus regius Eastern Silvery Minnow	no	3					understudied taxa
Margariscus margarita Pearl Dace	no	3					understudied taxa
Notropis bifrenatus Bridle Shiner	no	2	SC	yes			
Notropis heterolepis Blacknose Shiner	no	3					understudied taxa
Rhinichthys cataractae Longnose Dace	no	3	SC				understudied taxa
Esociformes (pikes and mudminnows; N = 1)							
Esox americanus americanus Redfin Pickerel	1	2	E				

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Table 1-3. continued: page 2 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
ACTINOPTERYGII (ray-finned fishes; N = 33)							
Gadiformes (cods, haddocks, grenadiers; N = 4)							
Brosme brosme Cusk	no	2		yes	SoC		recent significant decline
Gadus morhua Atlantic Cod	no	1		yes		VU	
Lota lota Burbot	2	3					understudied taxa
Melanogrammus aeglefinus Haddock	no	1		yes		VU	
Gasterosteiformes (sticklebacks; N = 1)							
Culaea inconstans Brook Stickleback	no	3	SC				understudied taxa
Osmeriformes (smelts and allies; N = 1)							
Osmerus mordax Rainbow Smelt	2	1		yes	SoC		regional endemic, recent significant declines, culturally significant
Perciformes (perch-like fishes; N = 6)							
Ammodytes americanus American Sand Lance	no	3		yes			
Anarhichas lupus Atlantic Wolffish	no	2			SoC		understudied taxa, recent significant declines
Anarhichas minor Spotted Wolffish	no	3		yes			understudied taxa
Etheostoma fusiforme Swamp Darter	1	2	T				
Morone saxatilis Striped Bass	no	2		yes			recent significant decline, culturally significant
Thunnus thynnus Atlantic Bluefin Tuna	no	2		yes	SoC	EN	
Pleuronectiformes (flatfish; N = 1)							
Pseudopleuronectes americanus Winter Flounder	no	2		yes			recent significant decline

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Table 1-3. continued: page 3 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
ACTINOPTERYGII (ray-finned fishes; N = 33)							
Salmoniformes (salmon, trout, and whitefish; N = 6)							
Coregonus clupeaformis Lake Whitefish	1	2	SC				climate change, recent significant declines
Prosopium cylindraceum Round Whitefish	2	2		yes			climate change
Salmo salar Atlantic Salmon	1	1		yes	E		culturally significant
Salvelinus alpinus oquassa Arctic Charr	1	1	SC	yes			regional endemic
Salvelinus fontinalis Brook Trout	2	3		yes			culturally significant
Salvelinus namaycush Lake Trout	1	3					understudied taxa
AMPHIBIA (amphibians; N = 4)							
Anura (frogs and toads; N = 2)							
Lithobates pipiens Northern Leopard Frog	no	2	SC	yes			
Lithobates septentrionalis Mink Frog	no	3					climate change
Caudata (salamanders; N = 2)							
Ambystoma laterale Blue-spotted Salamander	2	2	SC	yes			
Gyrinophilus porphyriticus Northern Spring Salamander	no	2	SC	yes			
ANTHOZOA (corals, sea pens, sea fans, sea anemones; N = 2)							
Alcyonacea (soft corals; N = 2)							
Alcyonium digitatum Dead Man's Fingers	no	3					understudied taxa, climate change
Gersemia rubiformis Sea Strawberry	no	2					understudied taxa, climate change, recent significant declines

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Table 1-3. continued: page 4 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
ASTEROIDEA (sea stars; N = 5)							
Forcipulatida (sea stars; N = 3)							
Asterias forbesi Forbes's Starfish	no	2					understudied taxa, climate change, recent significant declines
Asterias rubens Common Sea Star	no	2					understudied taxa, climate change, recent significant declines
Stephanasterias albula White Sea Star	no	2					understudied taxa, climate change, recent significant declines
Valvatida (N = 2)							
Crossaster papposus Common Sun Star	no	2					understudied taxa, climate change, recent significant declines
Solaster endeca Purple Sunstar	no	2					understudied taxa, climate change, recent significant declines
AVES (birds; N = 129)							
Accipitriformes (hawks, kites, eagles, and allies; N = 3)							
Aquila chrysaetos Golden Eagle	2	2	E	yes			
Buteo platypterus Broad-winged Hawk	no	3		yes			
Circus cyaneus Northern Harrier	no	3	SC				
Anseriformes (waterfowl; N = 4)							
Aythya marila Greater Scaup	2	2	SC				recent significant decline
Bucephala islandica Barrow's Goldeneye	2	1	T				regional endemic
Clangula hyemalis Long-tailed Duck	no	3				VU	
Histrionicus histrionicus Harlequin Duck	2	1	T	yes			regional endemic

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Table 1-3. continued: page 5 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
AVES (birds; N = 129)							
Apodiformes (swifts and hummingbirds; N = 1)							
Chaetura pelagica Chimney Swift	2	2	SC	yes			recent significant decline
Caprimulgiformes (nightjars; N = 2)							
Antrostomus vociferus Eastern Whip-poor-will	2	2	SC	yes			
Chordeiles minor Common Nighthawk	2	3		yes			
Charadriiformes (plovers, sandpipers, and allies; N = 30)							
Alca torda Razorbill	2	2	T				climate change
Arenaria interpres Ruddy Turnstone	2	2		yes			climate change, recent significant declines
Bartramia longicauda Upland Sandpiper	1	1	T	yes			
Calidris alpina Dunlin	no	3					climate change
Calidris canutus rufa Red Knot	2	1	SC	yes	T		recent significant decline
Calidris maritima Purple Sandpiper	2	1		yes			regional endemic, recent significant declines
Calidris minutilla Least Sandpiper	no	3					climate change
Calidris pusilla Semipalmated Sandpiper	2	2	SC	yes			climate change, recent significant declines
Charadrius melodus Piping Plover	1	1	E	yes	T		
Chlidonias niger Black Tern	1	2	E				climate change
Chroicocephalus philadelphia Bonaparte's Gull	2	3	SC				
Fratercula arctica Atlantic Puffin	2	2	T				climate change

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Table 1-3. continued: page 6 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
AVES (birds; N = 129)							
Charadriiformes (plovers, sandpipers, and allies; N = 30)							
Haematopus palliatus American Oystercatcher	1	3	SC	yes			climate change
Leucophaeus atricilla Laughing Gull	no	3	SC				
Limnodromus griseus Short-billed Dowitcher	no	3		yes			climate change
Numenius phaeopus Whimbrel	2	2	SC	yes			climate change
Phalaropus fulicarius Red Phalarope	no	3					climate change
Phalaropus lobatus Red-necked Phalarope	2	2	SC				climate change, recent significant declines
Pluvialis squatarola Black-bellied Plover	no	3					climate change
Scolopax minor American Woodcock	2	3					climate change
Sterna dougallii Roseate Tern	1	1	E	yes	E		
Sterna hirundo Common Tern	2	2	SC	yes			
Sterna paradisaea Arctic Tern	2	1	T	yes			
Sternula antillarum Least Tern	1	1	E	yes			
Tringa flavipes Lesser Yellowlegs	no	1	SC	yes			recent significant decline
Tringa melanoleuca Greater Yellowlegs	2	3					climate change
Tringa semipalmata Willet	2	3					climate change
Tringa solitaria Solitary Sandpiper	no	2		yes			climate change
Uria aalge Common Murre	2	3	SC				climate change

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Table 1-3. continued: page 7 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
AVES (birds; N = 129)							
Coraciiformes (kingfishers and allies; N = 1)							
Megaceryle alcyon Belted Kingfisher	no	3		yes			
Cuculiformes (cuckoos; N = 2)							
Coccyzus americanus Yellow-billed Cuckoo	no	2	SC	yes			
Coccyzus erythrophthalmus Black-billed Cuckoo	2	3		yes			
Falconiformes (caracaras and falcons; N = 2)							
Falco peregrinus Peregrine Falcon	1	1	E	yes			
Falco sparverius American Kestrel	no	3		yes			
Galliformes (grouse, quail, and allies; N = 1)							
Falcipennis canadensis Spruce Grouse	no	3					understudied taxa, climate change
Gaviiformes (loons; N = 2)							
Gavia immer Common Loon	2	3					climate change
Gavia stellata Red-throated Loon	no	3		yes			
Gruiformes (cranes and rails; N = 4)							
Coturnicops noveboracensis Yellow Rail	2	2	SC	yes			climate change
Fulica americana American Coot	2	3	SC				
Gallinula galeata Common Gallinule	2	2	T				climate change
Porzana carolina Sora	no	3		yes			
Passeriformes (perching birds; N = 59)							
Ammodramus caudacutus Saltmarsh Sparrow	1	1	SC	yes		VU	regional endemic
Ammodramus nelsoni Nelson's Sparrow	2	2	SC	yes			climate change

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Table 1-3. continued: page 8 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
AVES (birds; N = 129)							
Passeriformes (perching birds; N = 59)							
Ammodramus savannarum Grasshopper Sparrow	2	1	E	yes			
Anthus rubescens American Pipit	2	2	E				climate change
Cardellina canadensis Canada Warbler	2	2	SC	yes			
Catharus bicknelli Bicknell's Thrush	1	1	SC	yes		VU	regional endemic
Catharus fuscescens Veery	2	2	SC	yes			
Catharus ustulatus Swainson's Thrush	no	3					climate change
Cistothorus platensis Sedge Wren	1	1	E	yes			
Coccothraustes vespertinus Evening Grosbeak	no	2	SC	yes			climate change
Contopus cooperi Olive-sided Flycatcher	2	2	SC	yes			
Contopus virens Eastern Wood-Pewee	no	2	SC	yes			
Dolichonyx oryzivorus Bobolink	2	3		yes			
Empidonax flaviventris Yellow-bellied Flycatcher	no	3					climate change
Empidonax minimus Least Flycatcher	no	3	SC				
Eremophila alpestris Horned Lark	2	3	SC				
Euphagus carolinus Rusty Blackbird	2	1	SC	yes		VU	
Geothlypis philadelphia Mourning Warbler	no	3					climate change
Haemorhous purpureus Purple Finch	2	3		yes			

ESA Codes: Endangered Species [E]; Threatened Species [T]; Candidate Species [C]; Special Concern Species [SC]; Species of Concern [SoC]. IUCN Codes: Critically Endangered [CR]; Endangered [EN]; Vulnerable [VU].

Table 1-3. continued: page 9 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
AVES (birds; N = 129)							
Passeriformes (perching birds; N = 59)							
Hirundo rustica Barn Swallow	2	2	SC	yes			recent significant decline
Hylocichla mustelina Wood Thrush	2	1	SC	yes			recent significant decline
Icterus galbula Baltimore Oriole	2	3		yes			
Icterus spurius Orchard Oriole	no	3	SC				
Loxia curvirostra Red Crossbill	2	3					climate change
Loxia leucoptera White-winged Crossbill	no	3					climate change
Melospiza lincolni Lincoln's Sparrow	no	3					climate change
Mniotilta varia Black-and-white Warbler	2	2	SC	yes			
Oreothlypis peregrina Tennessee Warbler	no	2	SC				climate change
Parkesia motacilla Louisiana Waterthrush	2	3		yes			
Passerella iliaca Fox Sparrow	no	3	SC				
Perisoreus canadensis Gray Jay	no	3					climate change
Petrochelidon pyrrhonota Cliff Swallow	no	3					recent significant decline
Pheucticus ludovicianus Rose-breasted Grosbeak	2	3		yes			
Pinicola enucleator Pine Grosbeak	no	3					climate change
Pipilo erythrophthalmus Eastern Towhee	2	2	SC	yes			
Piranga olivacea Scarlet Tanager	2	3		yes			

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Table 1-3. continued: page 10 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
AVES (birds; N = 129)							
Passeriformes (perching birds; N = 59)							
Poecile hudsonicus Boreal Chickadee	no	2		yes			climate change
Progne subis Purple Martin	2	2	SC				understudied taxa
Regulus calendula Ruby-crowned Kinglet	no	2					climate change, recent significant declines
Riparia riparia Bank Swallow	no	1		yes			recent significant decline
Setophaga americana Northern Parula	2	3					climate change
Setophaga caerulescens Black-throated Blue Warbler	2	3		yes			
Setophaga castanea Bay-breasted Warbler	2	3		yes			
Setophaga discolor Prairie Warbler	2	2	SC	yes			
Setophaga fusca Blackburnian Warbler	2	3		yes			
Setophaga pensylvanica Chestnut-sided Warbler	2	2	SC	yes			
Setophaga petechia Yellow Warbler	no	3	SC				
Setophaga ruticilla American Redstart	no	2	SC	yes			
Setophaga striata Blackpoll Warbler	no	3					climate change
Setophaga tigrina Cape May Warbler	2	3					climate change
Setophaga virens Black-throated Green Warbler	2	3		yes			
Spizella pusilla Field Sparrow	2	3		yes			

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Table 1-3. continued: page 11 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
AVES (birds; N = 129)							
Passeriformes (perching birds; N = 59)							
Stelgidopteryx serripennis <i>Northern Rough-winged Swallow</i>	no	3	SC				
Sturnella magna <i>Eastern Meadowlark</i>	2	2	SC	yes			
Tachycineta bicolor <i>Tree Swallow</i>	no	2	SC	yes			
Toxostoma rufum <i>Brown Thrasher</i>	2	2	SC	yes			
Tyrannus tyrannus <i>Eastern Kingbird</i>	2	2	SC	yes			
Vermivora cyanoptera <i>Blue-winged Warbler</i>	1	2	SC	yes			
Zonotrichia albicollis <i>White-throated sparrow</i>	no	3	SC				
Pelecaniformes (pelecanus, herons, ibises, and allies; N = 6)							
Ardea herodias <i>Great Blue Heron</i>	2	2	SC				recent significant decline
Botaurus lentiginosus <i>American Bittern</i>	2	3		yes			
Egretta caerulea <i>Little Blue Heron</i>	2	3		yes			
Egretta thula <i>Snowy Egret</i>	2	3		yes			
Ixobrychus exilis <i>Least Bittern</i>	2	1	E	yes			
Nycticorax nycticorax <i>Black-crowned Night-heron</i>	2	2	E				
Piciformes (woodpeckers; N = 3)							
Colaptes auratus <i>Northern Flicker</i>	2	3		yes			
Picoides arcticus <i>Black-backed Woodpecker</i>	no	3					climate change

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Table 1-3. continued: page 12 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
AVES (birds; N = 129)							
Piciformes (woodpeckers; N = 3)							
Picooides dorsalis American Three-toed Woodpecker	2	3					climate change
Podicipediformes (grebes; N = 2)							
Podiceps auritus Horned Grebe	no	3		yes			
Podilymbus podiceps Pied-billed Grebe	2	3		yes			
Procellariiformes (tubenoses; N = 2)							
Oceanodroma leucorhoa Leach's Storm-petrel	no	3	SC				
Puffinus gravis Great Shearwater	2	3		yes			
Strigiformes (owls; N = 4)							
Asio flammeus Short-eared Owl	1	2	T	yes			
Asio otus Long-eared Owl	2	3					understudied taxa
Megascops asio Eastern Screech-Owl	2	3	SC				understudied taxa
Tyto alba Barn Owl	no	3	SC				
Suliformes (frigatebirds, boobies, cormorants, darters, and allies; N = 1)							
Phalacrocorax carbo Great Cormorant	2	1	T	yes			recent significant decline
BIVALVIA (marine and freshwater molluscs; N = 14)							
Myoida (saltwater clams; N = 3)							
Mya arenaria Softshell Clam	no	3					climate change
Mya truncata Gaper Clam	no	3					rediscovery potential, understudied taxa, climate change, recent significant declines

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Table 1-3. continued: page 13 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
BIVALVIA (marine and freshwater molluscs; N = 14)							
Myoida (saltwater clams; N = 3)							
Zirfaea crispata Atlantic Great Piddock	no	2					understudied taxa, climate change, recent significant declines
Mytiloida (mussels; N = 1)							
Mytilus edulis Blue Mussel	no	3					climate change
Ostreoida (oysters, scallops, and allies; N = 1)							
Crassostrea virginica Eastern oyster	no	3					understudied taxa, climate change
Pectinoida (N = 2)							
Chlamys islandica Icelandic Scallop	no	3					understudied taxa, climate change
Placopecten magellanicus Atlantic Sea Scallop	no	3					recent significant decline
Unionoida (freshwater mussels; N = 6)							
Alasmidonta undulata Triangle Floater	no	3		yes			
Alasmidonta varicosa Brook Floater	2	1	T	yes			
Anodonta implicata Alewife Floater	no	3		yes			
Lampsilis cariosa Yellow Lampmussel	1	1	T	yes		EN	
Leptodea ochracea Tidewater Mucket	1	1	T	yes			
Margaritifera margaritifera Eastern Pearlshell	no	3				EN	
Veneroida (veneroids; N = 1)							
Mercenaria mercenaria Hard-shelled Clam	no	3					climate change
CEPHALASPIDOMORPHI (lampreys; N = 1)							
Petromyzontiformes (lampreys; N = 1)							
Lethenteron appendix American Brook Lamprey	no	3		yes			

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Table 1-3. continued: page 14 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
CHONDRICHTHYES (sharks, rays, and skates; N = 9)							
Carcharhiniformes (ground sharks; N = 2)							
Prionace glauca Blue Shark	no	3					
Sphyrna zygaena Smooth Hammerhead	no	3				VU	
Lamniformes (sharks, skates, and rays ; N = 3)							
Alopias vulpinus Common Thresher Shark	no	3				VU	
Isurus oxyrinchus Shortfin Mako	no	2		yes		VU	
Lamna nasus Porbeagle	no	2		yes	SoC	VU	
Rajiformes (rays; N = 4)							
Amblyraja radiata Thorny Skate	no	2			SoC	VU	
Dipturus laevis Barndoor Skate	no	2		yes		EN	
Leucoraja ocellata Winter Skate	no	2				EN	
Malacoraja senta Smooth Skate	no	2				EN	
ECHINOIDEA (sea urchins; N = 1)							
Camarodonta (sea urchins; N = 1)							
Strongylocentrotus droebachiensis Green Sea Urchin	no	2					climate change, recent significant declines
GASTROPODA (aquatic and terrestrial snails; N = 15)							
Basommatophora (air-breathing freshwater snails; N = 2)							
Stagnicola mighelsi Bigmouth Pondsnaill	2	1	SC	yes			regional endemic
Stagnicola oronoensis Obese Pondsnaill	no	3					understudied taxa
Littorinimorpha (N = 2)							
Arrhoges occidentalis American Pelican Foot	no	2					understudied taxa, climate change, recent significant declines

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Table 1-3. continued: page 15 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
GASTROPODA (aquatic and terrestrial snails; N = 15)							
Littorinimorpha (N = 2)							
Limneria undata Wavy Lamellaria	no	3					understudied taxa, climate change
Neotaenioglossa (mostly sea snails; N = 5)							
Boreotrophon clathratus Clathrate Trophon	no	2					understudied taxa, climate change, recent significant declines
Boreotrophon truncatus Murex	no	2					understudied taxa, climate change, recent significant declines
Colus pygmaeus Colus Snail	no	2					understudied taxa, climate change, recent significant declines
Floridobia winkleyi New England Silt Snail	no	3					understudied taxa, regional endemic
Ptychatractus ligatus Spindle Shell	no	2					understudied taxa, climate change, recent significant declines
Stylommatophora (air-breathing snails land snails; N = 5)							
Appalachina sayana Spike-lip Crater	no	3					understudied taxa
Neohelix dentifera Big-tooth Whitelip	no	3					understudied taxa
Vertigo malleata Malleated Vertigo	no	3	SC				understudied taxa
Vertigo morsei Six-whorl Vertigo	2	1	E				understudied taxa, climate change
Vertigo paradoxa Mystery Vertigo	2	2	SC				
Thecosomata (sea butterflies; N = 1)							
Limacina helicina Limacina Snail	no	3					climate change

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Table 1-3. continued: page 16 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
HOLOTHUROIDEA (sea cucumbers; N = 4)							
Dendrochirotida (sea cucumbers; N = 4)							
Cucumaria frondosa Orange-footed Sea Cucumber	no	2					climate change, recent significant declines
Psolus fabricii Psolus	no	2					understudied taxa, climate change, recent significant declines
Psolus phantapus Psolus	no	2					understudied taxa, climate change, recent significant declines
Thyonidium drummondii Sea Cucumber	no	2					understudied taxa, climate change, recent significant declines
INSECTA (insects; N = 119)							
Coleoptera (beetles; N = 4)							
Cicindela ancocisconensis White Mountain Tiger Beetle	no	2	SC	yes			understudied taxa
Cicindela marginata Salt Marsh Tiger Beetle	no	2	SC				climate change
Cicindela marginipennis Cobblestone Tiger Beetle	no	1	E	yes			understudied taxa
Nebria nivalis gaspesiana Gaspé Gazelle Beetle	no	3					understudied taxa
Ephemeroptera (mayflies; N = 15)							
Ameletus browni A Mayfly	no	3	SC				understudied taxa
Baetisca berneri A Mayfly	no	3	SC				understudied taxa
Baetisca carolina A Mayfly	no	3	SC				understudied taxa
Baetisca lacustris A Mayfly	no	3	SC				understudied taxa
Baetisca rubescens A Mayfly	2	3	SC				understudied taxa, climate change
Epeorus frisoni Roaring Brook Mayfly	1	1	T	yes			regional endemic

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Table 1-3. continued: page 17 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
INSECTA (insects; N = 119)							
Ephemeroptera (mayflies; N = 15)							
Hexagenia rigida <i>A Mayfly</i>	no	3	SC				understudied taxa
Metretopus borealis <i>A Mayfly</i>	no	3	SC				understudied taxa
Nixe horrida <i>A Mayfly</i>	2	3	SC	yes			understudied taxa
Pameletus midas <i>A Mayfly</i>	no	3	SC				understudied taxa
Rhithrogena undulata <i>A Mayfly</i>	no	3	SC				understudied taxa
Siphonisca aerodromia <i>Tomah Mayfly</i>	1	1	T				regional endemic
Siphonurus barbaroides <i>A Mayfly</i>	no	3	SC				understudied taxa
Siphonurus barbarus <i>A Mayfly</i>	no	2	SC	yes			understudied taxa
Siphonurus demaryi <i>A Mayfly</i>	2	2	SC	yes			understudied taxa, regional endemic
Hymenoptera (ants, bees, wasps and sawflies; N = 10)							
Bombus affinis <i>Rusty-patched Bumble Bee</i>	no	1	SC	yes			recent significant decline
Bombus ashtoni <i>Ashton's Cuckoo Bumble Bee</i>	no	2	SC				rediscovery potential, recent significant declines
Bombus citrinus <i>Lemon Cuckoo Bumble Bee</i>	no	3	SC				understudied taxa
Bombus fernaldae <i>Fernald's Cuckoo Bumble Bee</i>	no	3	SC				understudied taxa
Bombus fervidus <i>Yellow Bumble Bee</i>	no	3	SC				understudied taxa
Bombus griseocollis <i>Brown-belted Bumble Bee</i>	no	3	SC				understudied taxa

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Table 1-3. continued: page 18 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
INSECTA (insects; N = 119)							
Hymenoptera (ants, bees, wasps and sawflies; N = 10)							
<i>Bombus insularis</i> <i>Indiscriminate Cuckoo</i> <i>Bumble Bee</i>	no	2	SC				rediscovery potential, understudied taxa
<i>Bombus pensylvanicus</i> <i>American Bumble Bee</i>	no	2	SC				rediscovery potential, recent significant declines
<i>Bombus sandersoni</i> <i>Sanderson's Bumble Bee</i>	no	3	SC				understudied taxa
<i>Bombus terricola</i> <i>Yellowbanded Bumble Bee</i>	no	3	SC				recent significant decline
Lepidoptera (butterflies, skippers, and moths; N = 47)							
<i>Atrytonopsis hianna</i> <i>Dusted Skipper</i>	no	3	SC				understudied taxa
<i>Boloria chariclea grandis</i> <i>Purple Lesser Fritillary</i>	2	2	T				understudied taxa, climate change
<i>Boloria frigga saga</i> <i>Frigga Fritillary</i>	2	1	E				understudied taxa, climate change
<i>Callophrys gryneus</i> <i>Juniper Hairstreak</i>	2	2	E				understudied taxa
<i>Callophrys hesseli</i> <i>Hessel's Hairstreak</i>	1	1	E				understudied taxa
<i>Callophrys lanoraieensis</i> <i>Bog Elfin</i>	no	3					regional endemic
<i>Catocala similis</i> <i>Similar Underwing</i>	no	3	SC				understudied taxa
<i>Chaetagnaea cerata</i> <i>A Noctuid Moth</i>	2	2	SC				rediscovery potential
<i>Chaetagnaea tremula</i> <i>Barrens Chaetagnaea</i>	no	3	SC				understudied taxa
<i>Citheronia sepulcralis</i> <i>Pine Devil</i>	2	2	SC				rediscovery potential
<i>Cucullia speyeri</i> <i>A Moth</i>	2	3					rediscovery potential
<i>Cupido amyntula maritima</i> <i>Western Tailed Blue</i>	no	3					understudied taxa

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Table 1-3. continued: page 19 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
INSECTA (insects; N = 119)							
Lepidoptera (butterflies, skippers, and moths; N = 47)							
Danaus plexippus Monarch	no	3					recent significant decline
Erora laeta Early Hairstreak	2	2	SC				rediscovery potential
Erynnis brizo Sleepy Duskywing	2	2	T				
Hemaris gracilis Graceful Clearwing	2	3	SC				understudied taxa
Hemileuca lucina New England Buckmoth	no	3					regional endemic
Hemileuca maia maia Eastern Buckmoth	2	2	SC				understudied taxa
Hesperia leonardus Leonard's Skipper	2	3	SC				
Hesperia metea Cobweb Skipper	2	3	SC				understudied taxa
Lapara coniferarum Southern Pine Sphinx	no	3	SC				understudied taxa
Lepipolys perscripta A Moth	no	3	SC				understudied taxa
Lithophane lepida lepida Pine Pinion	2	2	SC	yes			understudied taxa, regional endemic
Lycaena dorcas claytoni Clayton's Copper	1	2	T	yes			
Lycia rachelae Twilight Moth	1	2	T				understudied taxa
Metarranthis apiciaria Barrens Metarranthis Moth	no	2	SC	yes			rediscovery potential
Nepytia pellucidaria A Moth	2	3	SC				understudied taxa
Oeneis polixenes katahdin Katahdin Arctic	1	1	E	yes			regional endemic
Paonias astylus Huckleberry Sphinx	no	3	SC				understudied taxa

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Table 1-3. continued: page 20 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
INSECTA (insects; N = 119)							
Lepidoptera (butterflies, skippers, and moths; N = 47)							
Papilio brevicauda gaspeensis <i>Short-tailed Swallowtail</i>	no	3	SC				understudied taxa
Papilio troilus <i>Spicebush Swallowtail</i>	2	3	SC				
Plebejus idas <i>Northern Blue</i>	no	2	SC				understudied taxa, climate change
Plebejus idas empetri <i>Crowberry Blue</i>	2	2	SC				regional endemic
Polygonia satyrus <i>Satyr Comma</i>	no	3	SC				understudied taxa
Psectraglaea carmosa <i>Pink Sallow</i>	2	2	SC				rediscovery potential, understudied taxa
Satyrium edwardsii <i>Edwards' Hairstreak</i>	2	2	E				understudied taxa
Satyrium titus <i>Coral Hairstreak</i>	2	3	SC				
Satyroides appalachia <i>Appalachian Brown</i>	no	3	SC				
Spartiniphaga inops <i>Spartina Borer Moth</i>	no	3					rediscovery potential
Speranza exonerata <i>Barrens Itame</i>	2	2	SC				understudied taxa, regional endemic
Thorybes bathyllus <i>Southern Cloudywing</i>	no	3	SC				understudied taxa
Xylena thoracica <i>Acadian Swordgrass Moth</i>	no	3	SC				
Xylotype capax <i>Broad Sallow</i>	no	3	SC				understudied taxa
Xystocheilus rufago <i>Red-winged Sallow</i>	no	3	SC				understudied taxa
Zale lunifera <i>Bold-based Zale Moth</i>	2	3	SC				understudied taxa
Zale obliqua <i>Oblique Zale</i>	no	3	SC				understudied taxa

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Table 1-3. continued: page 21 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
INSECTA (insects; N = 119)							
Lepidoptera (butterflies, skippers, and moths; N = 47)							
Zanclognatha martha Pine Barrens Zanclognatha	2	1	T				understudied taxa, regional endemic
Odonata (dragonflies and damselflies; N = 36)							
Aeshna juncea Sedge Darner	2	2	SC	yes			understudied taxa, climate change
Aeshna sitchensis Zigzag Darner	no	3	SC	yes			
Anax longipes Comet Darner	no	3	SC				understudied taxa
Argia translata Dusky Dancer	2	3	SC				understudied taxa
Arigomphus furcifer Lilypad Clubtail	no	3	SC				
Celithemis martha Martha's Pennant	no	3		yes			regional endemic
Cordulegaster obliqua Arrowhead Spiketail	2	3	SC	yes			
Enallagma carunculatum Tule Bluet	2	3	SC				understudied taxa
Enallagma durum Big Bluet	2	3	SC				understudied taxa
Enallagma laterale New England Bluet	no	2		yes			regional endemic
Enallagma pictum Scarlet Bluet	2	2	SC	yes			regional endemic
Epiaeschna heros Swamp Darner	2	3	SC				understudied taxa
Erythrodiplax berenice Seaside Dragonlet	no	3		yes			
Gomphus quadricolor Rapids Clubtail	1	2	E				
Gomphus vastus Cobra Clubtail	2	3	SC				understudied taxa
Ischnura hastata Citrine Forktail	2	3	SC				understudied taxa

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Table 1-3. continued: page 22 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
INSECTA (insects; N = 119)							
Odonata (dragonflies and damselflies; N = 36)							
<i>Ischnura ramburii</i> <i>Rambur's Forktail</i>	2	3	SC				understudied taxa
<i>Lanthus vernalis</i> <i>Southern Pygmy Clubtail</i>	no	2	SC				regional endemic
<i>Leucorrhinia patricia</i> <i>Canada Whiteface</i>	2	2	SC	yes			climate change
<i>Libellula needhami</i> <i>Needhams Skimmer</i>	no	3	SC				understudied taxa
<i>Libellula semifasciata</i> <i>Painted Skimmer</i>	no	3	SC				
<i>Nannothemis bella</i> <i>Elfin Skimmer</i>	no	3		yes			
<i>Neurocordulia michaeli</i> <i>Broad-tailed Shadowdragon</i>	no	3		yes			
<i>Ophiogomphus anomalus</i> <i>Extra-striped Snaketail</i>	no	3		yes			
<i>Ophiogomphus colubrinus</i> <i>Boreal Snaketail</i>	2	1	T	yes			
<i>Ophiogomphus howei</i> <i>Pygmy Snaketail</i>	2	2	SC	yes			
<i>Progomphus obscurus</i> <i>Common Sanddragon</i>	no	3	SC				
<i>Rhionaeschna mutata</i> <i>Spatterdock Darner</i>	1	3	SC				understudied taxa
<i>Somatochlora albicincta</i> <i>Ringed Emerald</i>	no	3	SC				
<i>Somatochlora brevicincta</i> <i>Quebec Emerald</i>	2	2	SC	yes			climate change
<i>Somatochlora incurvata</i> <i>Incurvate Emerald</i>	no	3	SC	yes			
<i>Somatochlora minor</i> <i>Ocellated Emerald</i>	no	3		yes			
<i>Stylurus spiniceps</i> <i>Arrow Clubtail</i>	2	3	SC				

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Table 1-3. continued: page 23 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
INSECTA (insects; N = 119)							
Odonata (dragonflies and damselflies; N = 36)							
Tramea carolina Carolina Saddlebags	no	3	SC				understudied taxa
Tramea lacerata Black Saddlebags	no	3	SC				understudied taxa
Williamsonia lintneri Ringed Boghaunter	1	1	T	yes		VU	regional endemic
Plecoptera (stoneflies; N = 3)							
Alloperla voinae A Stonefly	no	3					regional endemic
Neoperla mainensis A Stonefly	2	3	SC	yes			rediscovery potential
Pteronarcys comstocki Spiny Salmonfly	no	3					rediscovery potential
Trichoptera (caddisflies; N = 4)							
Hydroptila blicklei A Caddisfly	no	3	SC	yes			understudied taxa, regional endemic
Hydroptila parachelops A Caddisfly	no	3	SC	yes			understudied taxa, regional endemic
Hydroptila tomah A Caddisfly	2	3	SC	yes			understudied taxa, regional endemic
Ochrotrichia denningi A Caddisfly	no	3					rediscovery potential, understudied taxa
MALACOSTRACA (crustaceans; N = 4)							
Decapoda (decapods; N = 4)							
Lebbeus groenlandicus Spiny Lebbeid Shrimp	no	2					understudied taxa, climate change, recent significant declines
Lebbeus polaris Polar Lebbeid Shrimp	no	2					understudied taxa, climate change, recent significant declines
Orconectes limosus Spinycheek Crayfish	no	3					regional endemic
Pandalus borealis Northern Shrimp	no	1		yes			regional endemic, recent significant declines

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Table 1-3. continued: page 24 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
MAMMALIA (mammals; N = 22)							
Artiodactyla (even-toed ungulates; N = 1)							
Alces alces americanus Moose	no	3					culturally significant
Carnivora (carnivores; N = 1)							
Lynx canadensis Canada Lynx	2	2	SC		T		climate change
Cetacea (whales; N = 7)							
Balaenoptera borealis Sei Whale	1	2	E	yes	E	EN	
Balaenoptera musculus Blue Whale	no	2		yes	E	EN	
Balaenoptera physalus Finback Whale	1	2	E	yes	E	EN	
Eubalaena glacialis North Atlantic Right Whale	1	1	E	yes	E	EN	
Megaptera novaeangliae Humpback Whale	1	1	E	yes	E		
Phocoena phocoena Harbor Porpoise	no	2					
Physeter macrocephalus Sperm Whale	1	2	E	yes	E	VU	
Chiroptera (bats; N = 8)							
Eptesicus fuscus Big Brown Bat	no	2	SC				recent significant decline
Lasionycteris noctivagans Silver-haired Bat	no	2	SC	yes			
Lasiurus borealis Eastern Red Bat	no	3	SC				
Lasiurus cinereus Hoary Bat	no	3	SC				
Myotis leibii Eastern Small-footed Myotis	2	1	T	yes			
Myotis lucifugus Little Brown Bat	no	1	E				recent significant decline
Myotis septentrionalis Northern Long-eared Myotis	no	1	E	yes	T		recent significant decline

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Table 1-3. continued: page 25 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
MAMMALIA (mammals; N = 22)							
Chiroptera (bats; N = 8)							
Perimyotis subflavus Tri-colored Bat	no	2	SC	yes			
Lagomorpha (rabbits, hares, and pikas; N = 1)							
Sylvilagus transitionalis New England Cottontail	1	1	E	yes	C	VU	regional endemic, recent significant declines
Rodentia (rodents; N = 3)							
Microtus pennsylvanicus shattucki Penobscot Meadow Vole	1	2	SC	yes			
Ondatra zibethicus Muskrat	no	3					culturally significant
Synaptomys borealis sphagnicola Northern Bog Lemming	2	1	T	yes			
Soricomorpha (shrews and relatives; N = 1)							
Sorex dispar Long-tailed Shrew	no	3		yes			
MAXILLOPODA (crustaceans; N = 1)							
Calanoida (calanoid copepods; N = 1)							
Calanus finmarchicus A Copepod	no	3					climate change
MEROSTOMATA (horseshoe crabs and sea scorpions; N = 1)							
Xiphosurida (horseshoe crabs; N = 1)							
Limulus polyphemus Horseshoe Crab	no	1		yes			recent significant decline
OPHIUROIDEA (brittle stars; N = 1)							
Euryalida (basket stars; N = 1)							
Gorgonocephalus arcticus Northern Basket Starfish	no	2					understudied taxa, climate change, recent significant declines

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Table 1-3. continued: page 26 of 26

CLASS Order Scientific name (Common name)	Maine SGCN Tier		Scale of Conservation Concern				Other Factors
	2005	2015	State	Regional	National	Global	
REPTILIA (reptiles; N = 11)							
Squamata (lizards and snakes; N = 3)							
Coluber constrictor <i>constrictor</i> <i>Northern Black Racer</i>	2	1	E	yes			
Storeria dekayi dekayi <i>Northern Brownsnake</i>	no	2	SC				regional endemic
Thamnophis sauritus <i>Eastern Ribbon Snake</i>	no	2	SC	yes			
Testudines (turtles and tortoises; N = 8)							
Caretta caretta <i>Loggerhead Seaturtle</i>	no	2	T	yes	T	EN	
Chelonia mydas <i>Green Seaturtle</i>	no	2		yes	E	EN	
Clemmys guttata <i>Spotted Turtle</i>	2	1	T	yes		EN	
Dermochelys coriacea <i>Leatherback Seaturtle</i>	no	1	E	yes	E		
Dermochelys coriacea <i>Leatherback Seaturtle</i>	no	1	E	yes	E	VU	
Emydoidea blandingii <i>Blanding's Turtle</i>	1	1	E	yes		EN	
Glyptemys insculpta <i>Wood Turtle</i>	2	1	SC	yes		EN	
Lepidochelys kempii <i>Kemp's Ridley Seaturtle</i>	no	2	E	yes	E	CR	
Terrapene carolina carolina <i>Eastern Box Turtle</i>	1	2	E	yes		VU	
RHYNCHONELLATA (brachiopods; N = 1)							
Terebratulida (articulate brachiopods; N = 1)							
Terebratulina septentrionalis <i>Lamp Shell</i>	no	2					understudied taxa, climate change, recent significant declines

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ELEMENT 2 - KEY HABITATS AND NATURAL COMMUNITIES

Element 2 identifies the extent and condition of wildlife habitats and community types essential to the conservation of Species of Greatest Conservation Need (SGCN).

Abstract Maine's Wildlife Action Plan employs The Northeast Terrestrial Habitat Classification System (NETHCS), developed by NatureServe and The Nature Conservancy (TNC), to identify the extent of habitats and community types essential to the conservation of Species of Greatest Conservation Need (SGCN). Federal and state agencies in the Northeast have endorsed the NETHCS as a tool for assessing habitat distribution and composition. The specific version of the NETHCS used in Maine includes a number of modifications made by the Maine Dept. of Marine Resources (MDMR) and the Maine Dept. of Inland Fisheries and Wildlife (MDIFW) to reflect Maine's landscape and coastal features. The basic layer within NETHCS is the habitat 'system', which corresponds to the Ecological Systems classification. There are approximately 150 Ecological Systems in Maine. The more general 'Macrogroup' level was used for several of our analyses, and there are 42 habitat macrogroups in Maine.

Maine further consolidated the macrogroups into three broad habitat categories to facilitate development of conservation actions. The broad categories are Coastal and Marine, Terrestrial (including Freshwater Wetlands) and Freshwater Aquatic (Rivers, Lakes, and Ponds). The importance of various habitats to SGCN is not related to their statewide abundance; habitats such as pine barrens, open freshwater wetlands, and rivers and streams are dis-proportionately important compared to many other habitat types. It is estimated that there are 3,824,842 acres of conservation land in Maine, accounting for nearly 20% of the State. Much of this conserved land lies within Focus Areas of Statewide Significance, which have been identified to help prioritize Maine's landscape for SGCN and other habitat values.

Significant Differences from 2005 Drawing from several sources, Maine's 2005 plan identified 21 key habitats important for the conservation of Species of Greatest Conservation Need. These habitats were cross-walked with the National Vegetation Classification and NatureServe ecological systems to promote regional and national consistency. The 2015 Wildlife Action Plan employs The Northeast Terrestrial Habitat Classification System (NETHCS), developed by NatureServe and The Nature Conservancy (TNC), to identify the extent of habitats and community types essential to the conservation of Species of Greatest Conservation Need (SGCN). Federal and state agencies in the Northeast have endorsed the NETHCS as a tool for assessing habitat distribution and composition. The specific version of the NETHCS used in Maine includes a number of minor alterations and additions made by the University of Massachusetts, as well as minor modifications made by the Maine Dept. of Marine Resources (MDMR) and the Maine Dept. of Inland Fisheries and Wildlife (MDIFW) to reflect Maine's landscape and coastal features. There are approximately 150 Ecological Systems in Maine and 42 habitat macrogroups. Maine further consolidated the macrogroups into three broad ecosystem categories to facilitate discussion among conservation partners during the

consideration of the extent and condition of SGCN habitats and during the development of conservation actions. The broad categories are Marine; Terrestrial, including Freshwater Wetlands; and Freshwater Rivers, Streams, Lakes, and Ponds.

2.1 LANDSCAPE OVERVIEW

Maine encompasses approximately 21 million acres of lands and waters, from the dramatic coastline to the heights of Mount Katahdin. Maine is as large as the remaining New England states combined, and more than 31,800 miles of streams and rivers and 5,600 lakes and ponds dot the landscape. Maine's scenic, rock-bound coast is 4,100 miles long and embraces 4,613 islands between Kittery and Eastport. Roughly one quarter of the state consists of freshwater wetlands, including hardwood floodplains, freshwater marshes, and dense assemblages of vernal pools. At nearly 90% forest cover, Maine is the most heavily forested state in the United States, but it also contains some of the most significant grassland and farmlands in the Northeast. Maine's broad habitat types are shown in Figure 1.

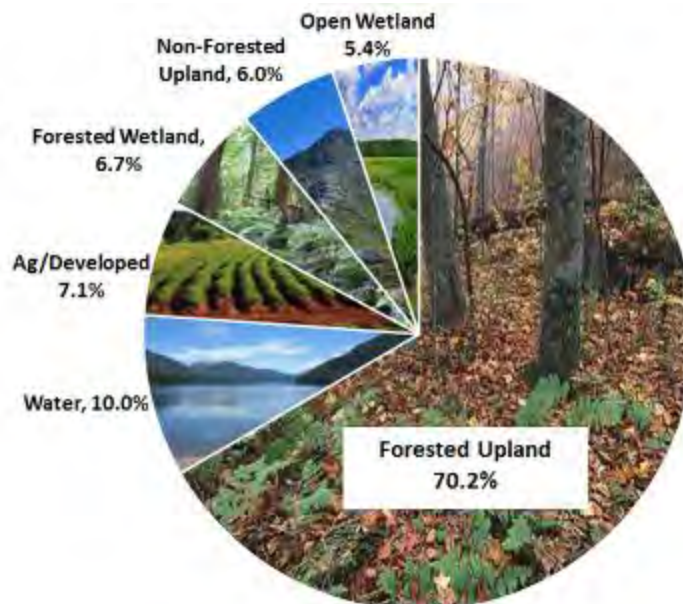


Figure 1. Broad breakdown of habitat types in Maine (Source: NatureServe Ecological Systems GIS layer, 2012)

2.1.1. CLIMATE

Maine's climate plays a major role in determining the plant and animal assemblages within the State. The National Weather Service separates Maine into three distinct climatological divisions – coastal, southern interior, and northern interior (Brandes 2001). The coastal division runs from Kittery to Eastport and about 20 miles inland. Here the ocean moderates the climate, making coastal winters warmer and summers cooler than the interior. The southern interior

division, covering the bottom one-third of the state, has the warmest summer weather and the highest numbers of clear days, whereas the northern interior (upper two-thirds of the state) boasts a mixed bag of snowy winters, warm summers, and the state's lowest rainfall.

Potential changes to Maine's climate, and their subsequent impacts on Maine's habitats and wildlife, have been the focus of recent studies by the University of Maine, conservation groups, and state agencies (Whitman et al 2013, Fenandez et al 2015). These changes include rising seas, altered natural disturbance processes (e.g., increased fire), changes in hydrology of wetlands and waterways, and transitions in forest composition. Despite uncertainties regarding the magnitude and timing of future changes in Maine's climate, there is a general understanding that high elevation habitats, boreal forests and peatlands, tidal marshes, and cold water fisheries are among Maine's vulnerable habitats (Whitman et al 2013). Potential impacts on SGCN are discussed in Element 3, and associated conservation actions are addressed in Element 4.

2.1.2 PHYSIOGRAPHY

Maine's western border adjoining New Hampshire and Quebec is characterized by rugged terrain with numerous glacier-scoured peaks, lakes, and valleys. The Appalachian Mountain chain, formed nearly 500 million years ago, extends into Maine from New Hampshire, terminating at the 5,268' Mount Katahdin. South and east of mountain areas lie rolling hills, smaller mountains, and broad river valleys. Maine's coastline consists of long sand beaches interrupted intermittently by rocky promontories in the southwest, and a series of peninsulas, narrow estuaries, bays, and coves north and east of Portland. Tides along Maine's coast are among the highest in the world, running between 12 and 24 feet. More than 4,600 islands dot the coast, some no more than rock ledges; others are vegetated and home to fulltime and seasonal residents.

2.1.3 HABITAT CLASSIFICATION

Northeast Terrestrial Habitat Classification System

The Northeast Terrestrial Habitat Classification System (NETHCS), developed by NatureServe and The Nature Conservancy (TNC), is a hierarchical framework for characterizing and mapping wildlife habitat in the region (The Nature Conservancy and NatureServe 2011). The classification system has been endorsed by the Northeast Association of Fish and Wildlife Agencies, US Fish and Wildlife Service (USFWS), and North Atlantic Landscape Conservation Cooperative (NALCC) as a tool for assessing habitat distribution and composition across the northeast. A companion effort is underway to map and classify habitats in adjacent parts of Canada. Details of this classification and mapping approach, including habitat 'profiles' of many common ecological systems, are available at <https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/dc/reportsdata/terrestrial/habitatmap/Pages/default.aspx>.

The specific version of the NETHCS used for Maine's State Wildlife Action Plan (SWAP) includes a number of minor alterations and additions made by the University of Massachusetts

(digital 'ESM Plus' layer available from NALCC), with additional minor modifications by the Maine Dept. of Marine Resources (MDMR) and the Maine Dept. of Inland Fisheries and Wildlife (MDIFW) to reflect Maine's landscape and coastal features. State-based modifications include incorporation of a geographic information system (GIS) layer of impermeable surfaces by MDIFW, and finer-scaled marine classes identified by MDMR that reflect underlying substrate and biotic composition in the intertidal and subtidal areas.

The basic layer within NETHCS is the habitat 'system', which corresponds to the Ecological Systems classification. There are approximately 150 Ecological Systems in Maine, and all have been entered into the State Wildlife Action Plan database. These include natural vegetated habitats ('Boreal Laurentian Bog'), aquatic systems ('Headwaters and Creeks'), marine systems ('Gastropod Reef'), and human-modified habitats ('Powerline Right of Way').

It is important to note that only about 50 of the 150 ecological systems are reflected in the GIS map layer because of scale limitations or difficulty of distinguishing tidal and subtidal habitats.

It should also be noted that although the classification system can accommodate structural modifiers (e.g., early successional forest), the GIS layer upon which our analyses are based does generally distinguish between successional stages of forest. Therefore, the 'Northern Hardwood and Conifer' macrogroup, for example, includes forest stands of all successional stages.

The more general 'Macrogroup' level was used for several of our analyses. There are 42 habitat macrogroups in Maine, though not all of these are mapped (e.g., intertidal mollusc reef). Acreages for mapped macrogroups in Maine are in Table 1 (shown in descending order of statewide acreage).

Table 1. Acreages of habitat macrogroups and proportions conserved in Maine (Sources: NatureServe Ecological Systems GIS map, 2012, and Maine Conserved Lands Database 2015)

Habitat Macrogroup	Acres in state	% of State	% Conserved
Northern Hardwood & Conifer	8,787,683	39.87%	17.1%
Boreal Upland Forest	6,560,611	29.77%	26.0%
Open Water	2,206,392	10.01%	1.9%
Northern Swamp	1,435,003	6.51%	18.9%
Agricultural	802,154	3.64%	1.2%
Urban/Suburban Built	765,055	3.47%	4.6%
Emergent Marsh	438,838	1.99%	52.2%
Northern Peatland	362,022	1.64%	27.9%
Wet Meadow / Shrub Marsh	354,013	1.61%	19.4%
Central Oak-Pine	126,500	0.57%	13.3%
Outcrop & Summit Scrub	64,435	0.29%	33.5%
Cliff and Talus	43,774	0.20%	49.4%
Northeastern Floodplain Forest	29,135	0.13%	13.8%
Salt Marsh	26,213	0.12%	30.2%
Ruderal Shrubland & Grassland	22,632	0.10%	7.1%
Alpine	3,624	0.02%	99.1%
Coastal Grassland & Shrubland	4,443	0.02%	11.0%
Central Hardwood Swamp	2,790	0.01%	1.8%
Rocky Coast	3,146	0.01%	18.7%
Coastal Plain Swamp	654	0.00%	18.9%
Glade and Savanna	183	0.00%	16.4%

Coastal and Marine Classification System

Since the NETHCS focuses on habitats vegetated with vascular plants, the NETHCS marine and coastal habitat components had poor accuracy and low specificity, especially for intertidal and subtidal habitats. "Rocky coast," "coastal," and "tidal marsh" habitat macrogroups were retained from the NETHCS scheme because they have associated vegetation, but all intertidal and subtidal habitats were reclassified to increase the specificity and accuracy for these ecologically, culturally, and economically important habitats. Staff from the Maine Department of Marine Resources (MDMR) and the Maine Coastal Program (MCP) worked with other SWAP partners to generate a coastal and marine habitat classification scheme for Maine's marine and coastal environment (Table 2) that encompasses all areas from the high tide line to the boundary of state waters, which extend three nautical miles offshore.

This habitat scheme was based on several existing classification systems that were either too detailed for our intended purpose or did not encompass the diverse breadth of habitats found in the coastal and marine regions in Maine (e.g. the Coastal and Marine Ecological Classification Standard, Brown, 1993). Although this scheme was adapted to fit the particular needs of the Maine SWAP, it is written in generalized terms, where possible, in order to fit the needs of surrounding New England states. Additionally, it is possible to crosswalk this scheme with the other classification schemes listed above in order to compare existing habitat classification and maps for the limited regions where these data exist. During the development of this habitat scheme, several gaps in knowledge were identified including the geographic locations and spatial extents of most marine and coastal habitats, the health and resiliency of these habitats, and past and projected ecosystem changes over time. Thus, mapping marine and coastal habitats and monitoring their changes over time have been highlighted as priorities for the conservation of marine SGCN over the next 10 years.

There are five broad coastal and marine habitat *formations* associated with conservation actions (tidal marsh, rocky coast, coastal, intertidal, and subtidal). The tidal marsh formation includes all peat-forming tidal marshes. The rocky coast formation encompasses rocky habitats above the high tide line. The coastal formation encompasses coastal grasslands and shrublands. The intertidal and sub-tidal formations encompass all of the benthic and pelagic (water column) habitats from the littoral zone to the open ocean. These broad habitat groups were subdivided into 15 *macrogroups* based on wave energy and the resulting physical composition of the substrate for benthic habitats (e.g. tidal marsh, mud, sand, rock, etc.); pelagic habitats are classified separately (e.g. water column).

At the habitat *system* level, additional biological and physical drivers that shape the ecosystem were incorporated into the classification scheme (e.g. presence of fauna and flora, relative nutrient concentration, desiccation and temperature stressors, etc.). In Maine, certain kinds of flora and fauna, such as eelgrass, kelp beds, and soft corals, form ecologically important habitats by creating a three-dimensional structure that rises above the substrate and serves as a nursery ground or can be used for protection by fishes and invertebrates. These habitats also tend to be vulnerable to environmental stressors. To highlight the importance and relative vulnerability of these habitats, the classification scheme lists these individually at the habitat system level. The language has been generalized to "submerged aquatic vegetation," "kelp bed," and "erect epifauna" to encompass additional flora and fauna that may exist throughout the northeast region in case other New England states elect to adopt this classification scheme.

Table 2. Coastal and marine habitat classification developed for the Maine Wildlife Action Plan.

Formation	Macrogroup	Habitat System
Tidal Marsh	Intertidal Tidal Marsh (peat-forming)	Acadian Coastal Salt Marsh
		Coastal Plain Tidal Marsh
Rocky Coast	Rocky Coast	Acadian-North Atlantic Rocky Coast
		North Atlantic Cobble Shore
Coastal	Coastal Grassland & Shrubland	Northern Atlantic Coastal Plain Dune and Maritime Grassland
		Northern Atlantic Coastal Plain Sandy Beach
Intertidal	Intertidal Mudflat	Non-Vascular Mudflat
		Freshwater Tidal Marsh
		Submerged Aquatic Vegetation
	Intertidal Sandy Shore	Sand Flat
		Submerged Aquatic Vegetation
		Sand Beach
	Intertidal Mollusc Reefs	Oyster Reef
		Gastropod Reef
		Mussel Reef
	Intertidal Bedrock	High Intertidal
		Mid-Intertidal
		Low-Intertidal
	Intertidal Gravel Shore	High Intertidal
		Mid-Intertidal
		Lower Intertidal
	Intertidal Water Column	Confined Channel
		Embayment
		Exposed Shore
Subtidal	Subtidal Mud Bottom	Unvegetated
		Submerged Aquatic Vegetation
	Subtidal Sand Bottom	Unvegetated
		Submerged Aquatic Vegetation
	Subtidal Mollusc Reefs	Oyster Reef
		Gastropod Reef
		Mussel Reef
	Subtidal Bedrock Bottom	Bedrock
		Kelp Bed
		Erect Epifauna
	Subtidal Coarse Gravel Bottom	Coarse Gravel
		Kelp Bed
Erect Epifauna		
Subtidal Pelagic (Water Column)	Nearshore	
	Offshore	
	Upwelling Zones	
	Confined Channel	

2.1.4 COASTAL AND MARINE ECOSYSTEMS

The Gulf of Maine watershed encompasses 69,115 square miles of Nova Scotia, New Brunswick, Maine, New Hampshire, Massachusetts, and Quebec. Maine is the only jurisdiction located entirely within the watershed. The Gulf of Maine, largely created by glaciers 10,000 to 20,000 years ago, is a semi-enclosed sea bounded to the south and east by Browns Bank and Georges Bank, and includes the Bay of Fundy. Underwater valleys plunge to depths of 1,500 feet.

Tidal Marshes and Estuaries

Gulf of Maine intertidal areas include salt marsh, rocky intertidal, and mudflat. The location and extent of these habitats are influenced by substrate, wave and tidal energy, tidal range, and slope. These habitats support several commercially important species as well as numerous SGCN.

Tidal marshes occur throughout the Gulf of Maine as large estuarine complexes or small fringe marshes. Of more than 5 million acres of wetlands in the state, approximately 157,500 acres are tidal (tidal flats, salt marsh, brackish marsh, aquatic beds, beach bars and reefs), including roughly 22,000 acres of salt marsh (ME DEP 1996, MEPC 1998, MNAP 2014). In fact, there are more tidal wetlands in Maine than in any state north of New Jersey (MEPC1998).

Despite harsh growing conditions and low plant diversity, tidal marshes are among the most productive ecosystems on Earth. They provide food, shelter, spawning, and nursery areas for Striped Bass, Flounder, and Mummichogs. Clams and Ribbed Mussels inhabit tidal marshes and adjacent tidal flats, and birds rely on the rich food webs of tidal marshes for breeding and during migration.

Estuaries, places where freshwater rivers meet the ocean, receive high concentrations of nutrients that are exported from watersheds, particularly during late winter and early spring snowmelt. Land-derived nutrients combine with nutrients from tidal marshes, rockweeds, and oceanic sources to stimulate phytoplankton growth throughout the year. Eelgrass and other submerged aquatic vegetation sometimes grow in estuaries and provide a three-dimensional habitat that serve as critically important nurseries for larval and juvenile invertebrates and fish, and feeding and nesting areas for migratory fish and birds. In addition, these areas serve as coastal storm buffers and filter sediments and pollutants before they reach coastal waters. Despite their importance, up to 50% of the region's original estuarine marshes have been lost through various human activities (MEPC1998), and many eelgrass meadows have receded dramatically over the last few years due to unknown causes.

Islands, Beaches, and Dunes

Roughly 500 Maine islands support nesting wading birds, seabirds, and Common Eiders. Islands cause upwelling of deep, nutrient-rich water to the sea surface, enriching nearby waters. Currents driven by tidal action swirl around islands and surge through passages, "creating a

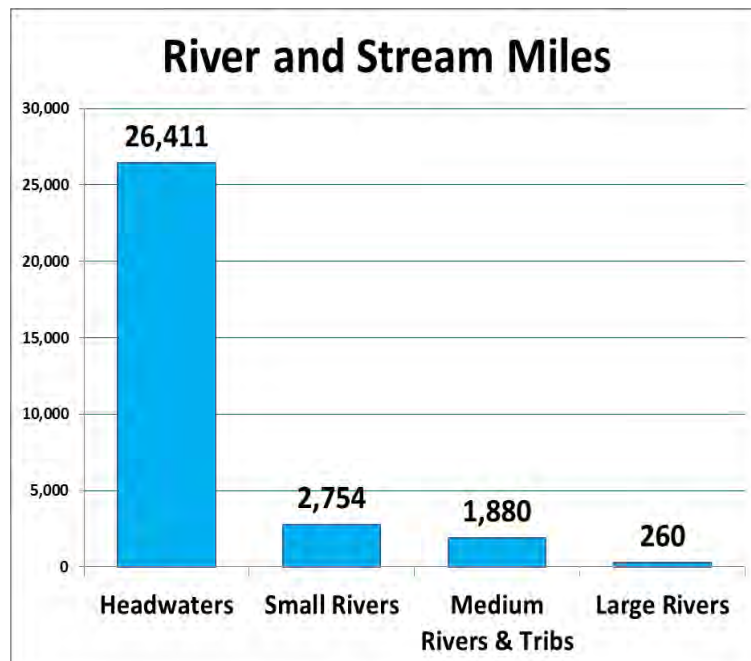
funnel effect that increases the volume of feed available to filter feeders, as well as those species that prey on the filter feeders” (Conkling 1995 as cited in GOMC 2004). Nearly all of Maine's larger islands were cleared in the past, primarily for sheep or cattle pasture. Many islands were burned repeatedly to remove trees and increase hay production. Human use of the islands peaked roughly 100 years ago, and since early in this century, gradual abandonment of many islands has resulted in their reforestation. In the last few decades, recreational use and construction of seasonal homes have limited the ecological recovery of some islands.

Beaches, pounded by an average 8,000 waves a day, may be high-energy, climatically extreme environments. They vary from long shorelines of fine-grained silt or sand to cobbleshores and boulders. Because of geological differences between western and Downeast Maine, large sand beaches are mostly limited to southern Maine. Sand dunes, often located upslope of sand beaches, are hillocks of wind-blown sand originally brought to the rear of beaches by ocean waves and stabilized by beach grasses. Major dune systems in Maine are located at Scarborough Beach, and Popham and Reid State Parks.

2.1.5 AQUATIC ECOSYSTEMS

Maine has more than 5,000 rivers and streams, encompassing 31,800 miles of flowing waters that cover nearly half of the watershed for the Gulf of Maine. More of Maine’s rivers and streams are undeveloped and free-flowing than any other state in the northeastern United States (Bennett 1988). The state’s major rivers include the Penobscot (350 mi), the St. John (211 mi), the Androscoggin (175 mi), the Kennebec (150 mi), the Saco (104 mi), and the St. Croix (75 mi). However, the overwhelming majority of flowing water mileage in Maine is in headwater streams (Figure 2). Maine also boasts more than 5,600 lakes and ponds. Moosehead Lake, covering about 117 mi², is the state’s largest lake, and Sebago Lake is the deepest at 316 ft (40 ft below sea level).

Figure 2: River and Stream Mileage in Maine



2.1.6 TERRESTRIAL AND WETLAND ECOSYSTEMS

Terrestrial Ecosystems

Maine falls in the transition between the deciduous forest region to the south and the boreal forest region to the north. Maine's forests cover more than 17 million acres, making Maine the most heavily forested state in the nation. Unlike other regions where forest cover has been almost completely lost due to conversion to agriculture or other uses, Maine retains or has regrown much of its forest cover. Sixty-seven woody plant species reach their range limits in south-central Maine, and an additional 44 woody plant species define a coastal-inland transition zone, reaching their western range limits in a southwest-northeast belt bisecting the state (McMahon 1990). *Natural Landscapes of Maine* (Gawler and Cutko, 2010) describes 104 Natural Community types that are linked to the NatureServe's National Vegetation Classification and the Ecological Systems.

At the macrogroup level, Maine's most abundant forest type is Northern Hardwood and Conifer, which accounts for approximately 40% of the state and extends from York to Aroostook County (Figure 3). This macrogroup consists of a mosaic of northern hardwood, spruce-fir, and mixed forest types featuring Sugar Maple, Beech, Yellow Birch, Red Spruce, Balsam Fir, and Hemlock. Boreal Forest, which accounts for 30% of the state, is dominated by spruce-fir types and is most common in northern Maine and along the Downeast Coast. The Central Oak Pine macrogroup, characterized by White Pine and Red Oak, occurs in southernmost Maine and accounts for less than 1% of the state.

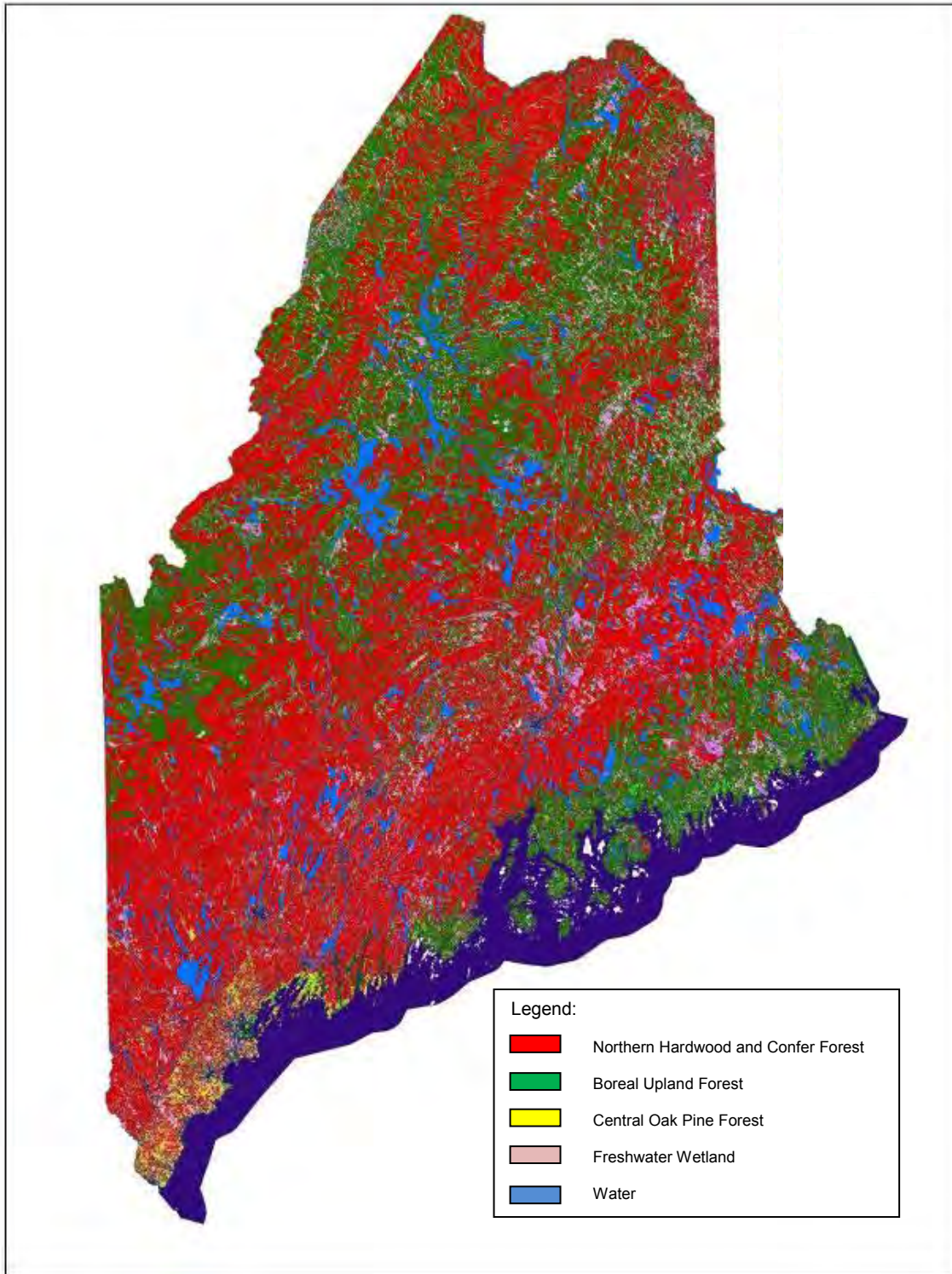


Figure 3: Generalized map of Maine habitat types, from the Northeastern Habitat Classification System

Freshwater Wetland Ecosystems

Freshwater wetlands account for roughly one quarter of the surface area of Maine (Calhoun 2001), four times the wetland area of the other New England States combined. Forested wetlands include red maple swamps, spruce flats, and cedar swamps, while non-forested wetlands range from emergent meadows created by beavers to large peatlands. In particular, Maine's diversity of peatland types is unequalled in the United States (Davis et al. 1983). The state's latitudinal, altitudinal, and coastal-inland gradients are all reflected in the varying peatland morphologies and vegetation composition. Some Maine peatland types are rare in the state (maritime slope bogs, coastal plateau bogs, circumneutral fens, patterned fens, and eccentric bogs), while others are more common (unpatterned fens, domed bogs, level bogs, kettlehole bogs and ponds, and some streamshore ecosystems).

Native Plants (*to be moved to SGCN chapter*)

There are approximately 1,443 native and 653 introduced species of vascular plants in Maine (Gawler et al. 1996). The state's vascular plants include species at the northern edge of their range and boreal representatives at their southern limit.

No plant species are included as Maine SGCN taxa because SGCN are restricted to fauna only. There is presently no statutory protection for native plants in Maine, though natural community and landscape level conservation of SGCN and their habitats will provide secondary benefits to many rare and vulnerable plants.

The Official List of Endangered and Threatened Plants in Maine is a list of native vascular plant species whose populations within the state are highly vulnerable to loss. Species on the list are typically known from a very small number of sites within the state, and many require unique habitat for survival. Roughly one third are considered vulnerable to climate change. The list is used to assist scientific research, environmental assessment, permit review, land management, and for educational purposes. Nearly one quarter of Maine's native flora (340 species) is considered possibly extirpated, rare, Threatened, or Endangered in the State, and 15 species, or fewer than two percent, of the plants native to Maine are rare throughout their worldwide range (e.g., ranked G1 or G2). The list is managed by the Maine Natural Areas Program and is under the jurisdiction of the Commissioner of the Department of Agriculture, Conservation and Forestry. Section 6 funding under the U.S. Endangered Species Act supports conservation of federally listed plants in Maine.

2.1.7 CONSERVATION LAND IN MAINE

According to the best available data, there are 3,824,842 acres of conservation land in Maine, accounting for nearly 20% of the State¹ (Schlawin and Cutko 2014). This conservation land includes parcels with a variety of restrictions, including "working forest" conservation easements, public lands managed for multiple uses, private conservation lands, state Ecological Reserves, and others. There are 757,450 acres of land that are considered 'Gap 1 or Gap 2' according to the USFWS classification of conserved lands. These Gap 1 and Gap 2 lands are

¹ The state's database of conservation lands is continually being updated; some smaller conservation parcels and municipal lots are not included in these totals.

managed for non-extractive uses (i.e., off limits to timber harvesting, gravel extraction, etc.) and account for just under 4% of the state (Figure 4).

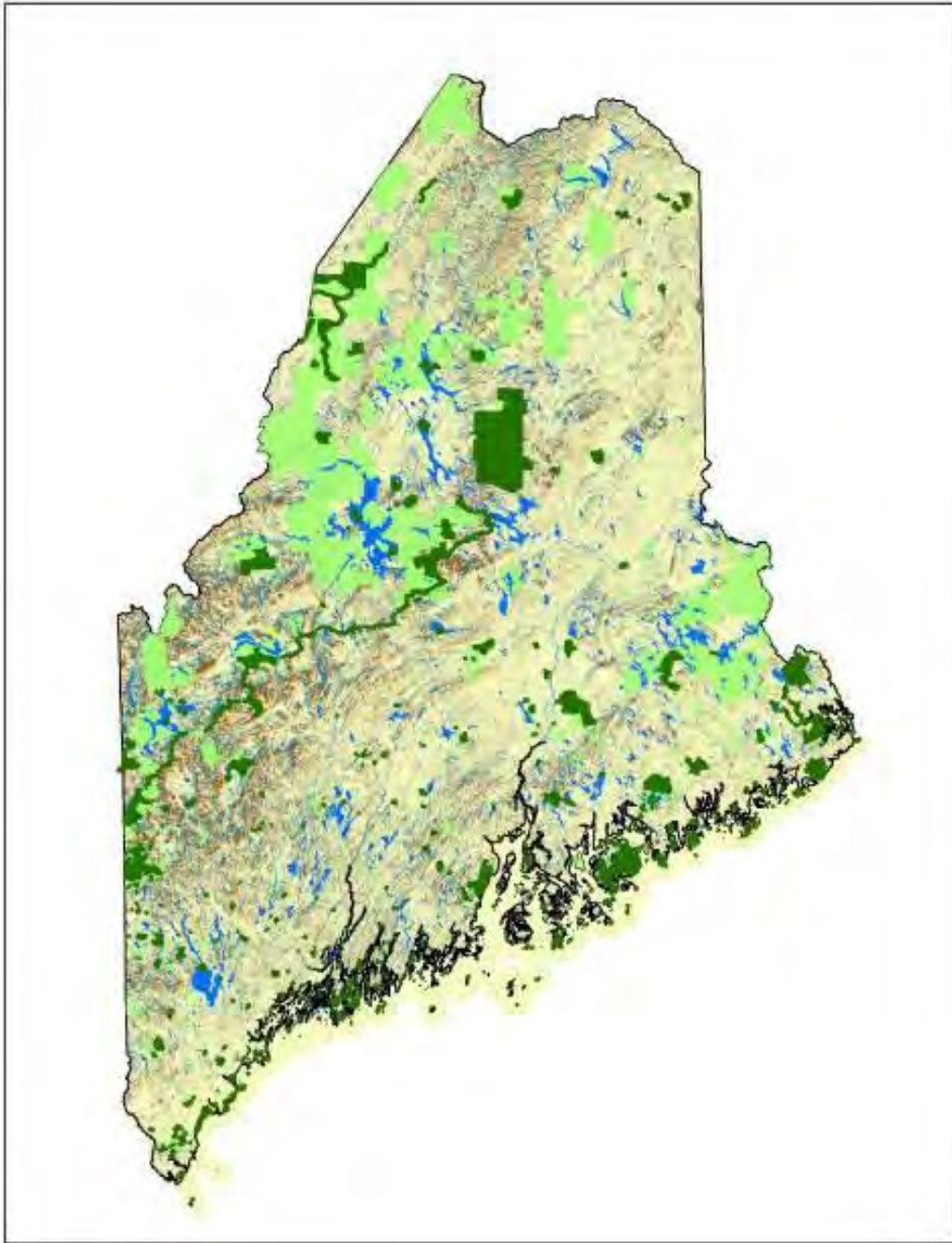


Figure 4: Conserved lands in Maine. Dark green lands are Gap 2 (off limits to extractive uses) and light green lands are considered Gap 3 (fee lands and conservation easements managed for forest products).

MDIFW holds title to approximately 106,000 acres on more than 50 Wildlife Management Areas (WMAs). Most of these lands were purchased with federal Pittman-Robertson funds, other federal matching funds, Maine citizen approved bond monies, gifts, Maine State Lottery Outdoor Heritage funds, and North Atlantic Wetland Conservation Act grants. Holdings include forested uplands, grasslands, freshwater and tidal wetlands, and seabird nesting islands. Wetlands account for more than 37% of WMAs, and several wetland types (emergent marsh, northern peatland, northern swamp, wet meadow/shrub marsh) are more than twice as well represented in WMAs compared to the landscape as a whole.

For each WMA, MDIFW develops a management plan that describes the natural resources occurring on the property, history of past uses, wildlife management objectives, and future plans for additional acquisitions, habitat maintenance, and development activities. Plans are updated every five years to reflect new land acquisitions and any changes in management objectives. WMA information and map are available at <http://www.maine.gov/ifw/wildlife/land/index.html>.

2.1.8 ECOREGIONS

Ecoregions (or biophysical regions) are defined as large areas with similar biota, climate, and physical environment. Most coarse-grained ecoregional classifications (e.g., Westveld 1956, Bailey 1980, U.S. Environmental Protection Agency 2009) typically divide Maine into two or three ecoregions or biophysical 'provinces'. For the purposes of inventory and conservation planning, MDIFW and MNAP have used 7 biophysical sections (Figure 5). While a map of the 7 sections gives the impression of distinct entities, the gradients in environment and species composition really form a continuum of change (McMahon 1990).

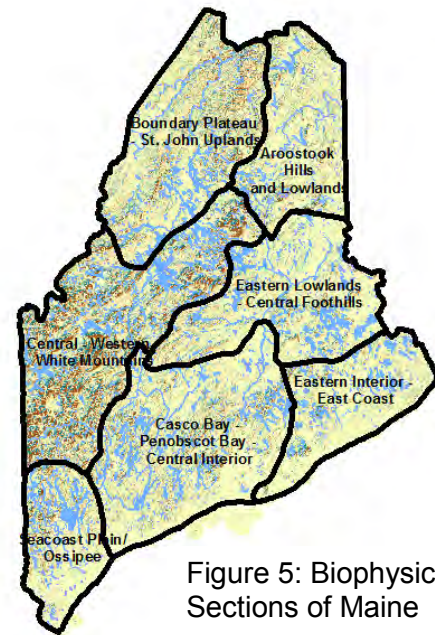


Figure 5: Biophysical Sections of Maine

2.1.9 IMPORTANCE OF HABITATS TO SGCN

Maine has identified 376 Species of Greatest Conservation Need. MDIFW and MDMR staff, in consultation with species experts and stakeholders, identified the primary and secondary habitats important to the lifecycle of each of Maine's SGCN. However, habitat requirements for all SGCN species, especially some invertebrates, are not well understood, so best professional judgment was exercised in those cases.

The importance of each habitat type to SGCN varies and is not proportional to their statewide acreage. Figure 6 indicates that while the majority of the state is forest uplands, those habitats provide habitat to fewer than 35% of the state's SGCN. Conversely, open wetlands account for only 5% of the state but support more than 21% of the state's SGCN.

Table 3 indicates the importance of various habitat macrogroups to SGCN. Northern Hardwood and Conifer Forest supports 153 SGCN, more than any other type. This is not surprising, given that this habitat types is the most abundant in the state, covering nearly 40% of Maine. However, Central Oak Pine Forest provides habitat for 127 SGCN but covers *less than 1% of the state*. The importance of the Central Oak Pine Type is largely driven by the value of the Northeastern Interior Pine Barrens ecological system, which is home to 42 SGCN and covers less than 9,000 acres statewide.

All 14 of the Marine and Coastal Macrogroups support multiple SGCN, with the sub-tidal pelagic group home to the most Priority 1 SGCN as well as total SGCN.

Notably, habitats that are moderately to significantly altered by humans provide habitat for numerous SGCN. In particular, agricultural areas support 40 SGCN, and significant numbers of SGCN are also supported by Ruderal Grasslands and Shrublands, Urban/Suburban – Built, and Modified – Managed Marshes.

Figure 6: Proportions of Statewide Habitats and SGCN (see text for explanation)

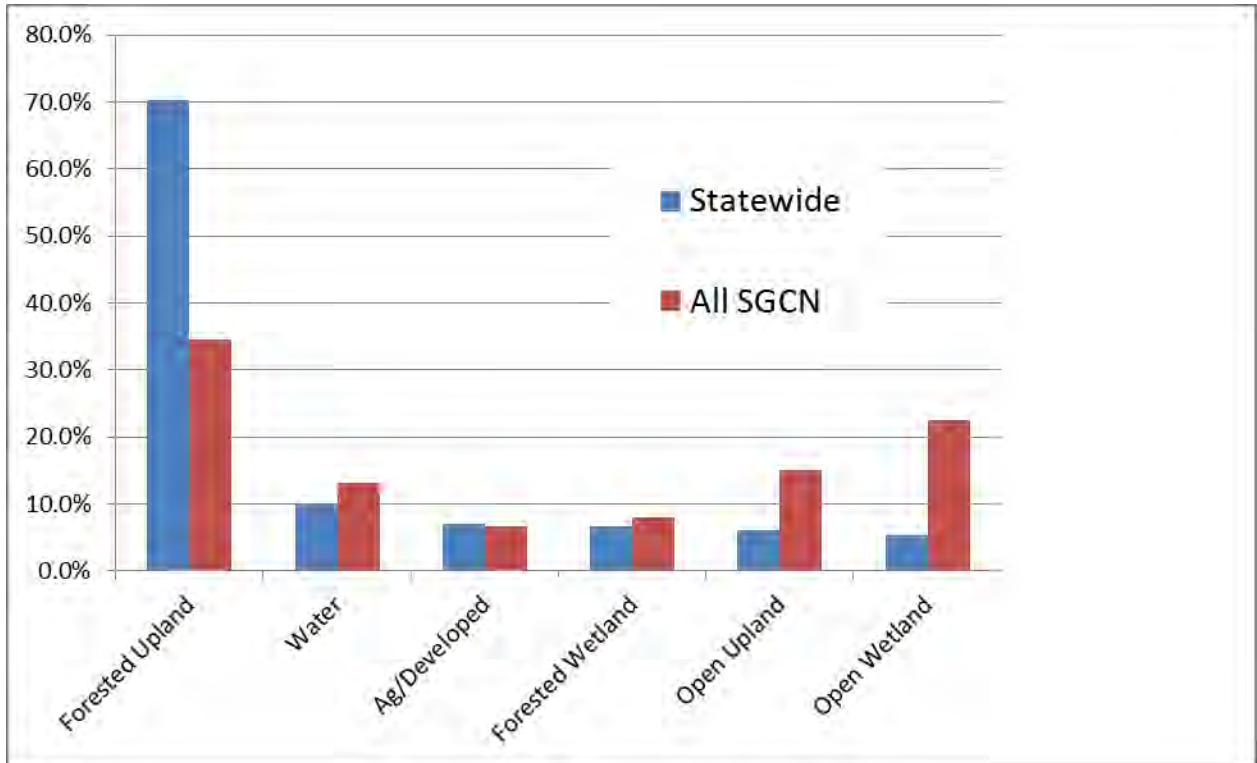


Table 3: SGCN Associations with Habitat Macrogroups

Macrogroup Name	Priority 1	Priority 2	Priority 3	Total SGCN
Coastal/Marine				
Intertidal Bedrock	3	10	6	19
Intertidal Gravel Shore	1	19	15	35
Intertidal Mollusc Reefs	3	1	5	9
Intertidal Mudflat	7	13	16	36
Intertidal Sandy Shore	8	10	9	27
Intertidal Tidal Marsh (peat-forming)	6	14	16	36
Intertidal Water Column	11	5	10	26
Rocky Coast	6	11	13	30
Subtidal Bedrock Bottom	3	13	2	18
Subtidal Coarse Gravel Bottom	7	31	9	47
Subtidal Mollusc Reefs	2	3	3	8
Subtidal Mud Bottom	6	20	9	35
Subtidal Pelagic (Water Column)	22	46	28	96
Subtidal Sand Bottom	9	21	4	34
Freshwater/Aquatic				
Coastal Plain Pond	4	9	9	22
Lake & River Shore	2	3	4	9
Lakes and Ponds	12	24	43	79
Rivers and Streams	25	21	54	100
Terrestrial				
Agricultural	10	16	14	40
Alpine	3	4	13	20
Boreal Upland Forest	11	28	82	121
Central Oak-Pine	9	47	71	127
Cliff and Talus	4	4	2	10
Coastal Grassland & Shrubland	1	7	10	18
Exotic Upland Forest	4	5	3	12
Extractive	7	4	3	14
Glade, Barren and Savanna		7	1	8
Maintained Grasses and Mixed Cover	4	5	10	19
Northern Hardwood & Conifer	12	42	99	153
Outcrop & Summit Scrub	6	6	6	18
Plantation and Ruderal Forest	4	18	12	34
Ruderal Shrubland & Grassland	11	27	34	72
Urban-Suburban Built	3	14	15	32
Wetlands				
Boreal Forested Peatland	1	8	20	29
Central Hardwood Swamp	3	4	1	8
Coastal Plain Peat Swamp	1	2		3
Emergent Marsh	7	18	26	51
Modified-Managed Marsh	6	12	12	30
Northeastern Floodplain Forest	5	8	21	34
Northern Peatland & Fens	7	18	33	58
Northern Swamp	6	22	26	54
Wet Meadow-Shrub Marsh	11	22	27	60

2.1.9 FOCUS AREAS OF ECOLOGICAL SIGNIFICANCE

Background

Using data from inventory work and from other sources, biologists at Maine Natural Areas Program (MNAP), MDIFW, and The Nature Conservancy (TNC) evaluated the landscape identifying the areas with the highest concentrations of rare species and high quality habitats. Degree of rarity and landscape context were also included in the process. The result of this effort is a mapped suite of more than 100 species-at-risk Focus Areas. These areas include assemblages of the best examples of rare species populations and high quality natural habitats in Maine. For each species-at-risk Focus Area there is a basic conservation plan that includes descriptions of significant features, recommendations for how best to protect those resources, and a map that delimits the area and shows locations of rare species and high quality habitats. Maps and descriptions of Focus Areas that occur in Maine's organized town are available at <http://www.maine.gov/dacf/mnap/focusarea/>.

Focus Areas have become integrated into a number of land conservation programs such as the Maine Natural Resources Conservation Program, Land for Maine's Future Program, and Forest Legacy Program. They have been recognized by the land trust community and others as important indicators of ecological significance.

Criteria and Delineation

Criteria used to delineate focus areas include locations of rare plants, animals, and natural communities; locations of the best examples of common natural communities; locations of significant wildlife habitats; and locations where these features overlapped with larger undeveloped blocks. Focus Area boundaries are based on sub-watersheds and major fragmenting features such as roads. The boundaries are neither firm nor field-checked; rather, they are meant to indicate the general location of conservation focus.

What do Focus Areas Represent?

In 2014 an assessment of Maine's Focus Areas was initiated to determine their effectiveness at conserving the variety of SGCN and habitats across the state, including conservations for a changing climate. While this assessment has not yet been finalized, a few key findings include:

- nearly all Focus Areas meet multiple criteria; that is, most Focus Areas support a combination of rare species and important wildlife habitats.
- most habitat macrogroups are well represented in Focus Areas, and several macrogroups (e.g. alpine) are more than four times as abundant in Focus Areas relative to their overall statewide coverage.
- the network of Focus Areas generally indicates a high resilience to climate change, reflecting both high habitat connectivity and representing nearly the full variety of Maine's geophysical settings.

In addition to Species of Greatest Conservation Need, the data used to identify Focus Areas are described below.

Essential Wildlife Habitats are defined as areas currently or historically providing physical or biological features essential to the conservation of an Endangered or Threatened species in Maine, and which may require special management considerations. Examples of areas that could qualify for designation are nest sites or important feeding areas. For some species, protection of these kinds of habitats is vital to preventing further decline or achieving recovery goals.

Before an area can become designated as Essential Habitat, it must be identified and mapped by MDIFW and adopted through public rulemaking procedures, following Maine's Administrative Procedures Act. Essential Habitats were first taken through rulemaking by MDIFW in 1989, when designation criteria and protection guidelines were developed for Bald Eagle nest sites. Since then, Essential Habitat has also been implemented for three more listed species: the Roseate Tern, Least Tern, and Piping Plover. Additions of newly qualified areas, as well as deletions of sites no longer eligible, are ongoing for these four species.

Once an area becomes designated as Essential Habitat, the Maine Endangered Species Act requires that no state agency or municipal government shall permit, license, fund, or carry out projects that would significantly alter the habitat or violate protection guidelines adopted for the habitat. If a project occurs partly or wholly within an Essential Habitat, it must be evaluated by MDIFW before state and/or municipal permits can be approved or project activities can take place.

This regulatory habitat protection tool is used only when habitat loss has been identified as a major factor limiting species recovery. This action rarely stops development. In fact, in the past, most development has proceeded, but MDIFW biologists work to modify the project so listed species and their habitat are protected.

Significant Wildlife Habitats include: habitat for Endangered and Threatened species; high and moderate value deer wintering areas and travel corridors; high and moderate value waterfowl and wading bird habitats; shorebird nesting, feeding, and staging areas; seabird nesting islands; significant vernal pools (not mapped in this project); and nursery areas for Atlantic salmon (not mapped in this project). These habitats are mapped as a product of the Natural Resources Protection Act (NRPA), a law passed in 1988 to prevent degradation of significant state resources. This law provides for habitat identification and mapping for animals that have very specific habitat requirements. To date, seabird nesting islands have received formal designation as Significant Wildlife Habitat. Other candidate Significant Wildlife Habitats have yet to receive full legal designation, but various state agencies reviewing development applications refer to these mapped data for guidance on permitting.

Other Rare Wildlife Data contains Endangered and Threatened animal habitats and the locations of rare animals themselves. These rare animals also include Special Concern species that may be very rare or vulnerable, for which biologists are gathering more information.

Large Undeveloped Blocks are relatively unbroken areas of habitat that include forest, grassland/agricultural land, and wetlands. "Unbroken" indicates that the habitat is crossed by few roads, and has relatively little development and human habitation.

MNAP Rare or Exemplary Natural Communities are two broad classes of natural communities recognized as important for conservation: those that are rare and those that are

common but in exemplary condition. A natural community is a system of interacting plants and their common environment, recurring across the landscape, where the effects of human intervention are minimal. There are currently 104 natural communities known in Maine, examples of which include Pitch Pine/Scrub Oak barrens, Atlantic White cedar bog, and *Spartina* tidal marsh. Examples of common community types include oak/pine forest, Red Maple swamp, and cattail marsh. Most upland natural communities have been impacted by land use practices, and it is unusual to find relatively large, undisturbed examples of them. Size, disturbance, and condition are all considered when assessing the quality of common natural communities.

MNAP Rare Plant Locations designate specific points where populations of rare, Threatened, and Endangered plants have been documented and, for some species, habitat for the respective plants. Rare plants have no formal protection in Maine (rare plant legislation is for informational purposes only), thus the habitat in which these plants occur is important for their survival. Rare Plant Locations may occur outside of, or within documented MNAP Rare and Exemplary Natural Communities. Rare plants are often components of documented natural communities and can be conserved in the context of these larger systems. Populations of rare plants outside of documented natural communities will require separate conservation actions.

Key to Acronyms

GIS	Geographic Information System
LIP	Landowner Incentive Program
MDFW	Maine Dept. of Inland Fisheries and Wildlife
MDMR	Maine Dept. of Marine Resources
MNAP	Maine Natural Areas Program
NALCC	North Atlantic Landscape Conservation Cooperative
NETHCS	Northeast Terrestrial Habitat Classification System
NRPA	Natural Resources Protection Act
SGCN	Species of Greatest Conservation Need
SWAP	State Wildlife Action Plan
TNC	The Nature Conservancy
USFWS	U.S. Fish and Wildlife Service
WMA	Wildlife Management Area

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ELEMENT 3: PROBLEMS AFFECTING SGCN AND THEIR HABITATS

Abstract

Maine's Wildlife Action Plan focuses much attention on the habitats used by Species of Greatest Conservation Need (SGCN). The Plan uses a coarse filter – fine filter approach to conservation to ensure, where possible, that individual conservation initiatives benefit multiple species, while also acknowledging that some species require individualized attention. We assigned stressors to both habitats and to SGCN, in order to clearly identify the issues that should be addressed at each level in the conservation hierarchy. As with most other states in the Northeast, we identified stressors using the International Union for the Conservation of Nature (IUCN) Threat Classification Scheme. While the IUCN system is useful for categorizing stressors to SGCN and their habitats, we found that the system lacks the resolution to clearly identify the specific issues that should be considered for conservation attention. Therefore, when assigning stressors we chose to adopt the primary and secondary IUCN categories, but replaced the tertiary category with a detailed narrative that fully describes the issue and its impact on the species or habitat being considered. In addition, we adapted Table 7 (*Threat characteristics and categorical ratings*) from The Northeast Lexicon to identify characteristics for each stressor assignment.

We assigned stressors to Priority 1 and 2 SGCN, and assigned 'Severity' and 'Actionability' characteristics for each Stressor – SGCN interaction. The concepts of Likelihood, Certainty and Spatial Extent were considered implicitly, and only those Stressors that were determined to have a moderate or high impact for each of these characteristics were assigned. In addition, only those stressors with moderate or high severity were assigned to SGCN. In addition, we developed a simple matrix to prioritize SGCN stressors, using the combination of the Impact scores for 'Severity' and 'Actionability.' We identified stressors for terrestrial and freshwater aquatic habitats using Anderson et al. (2013) as our primary source of reference material. Because no single comprehensive source is available that describes that state of marine habitats along Maine's coast, we used a wide variety of scientific publications to compile information on stressors. We assumed that the habitat systems within each terrestrial and marine macrogroup all faced similar conservation problems; therefore we assigned stressors to each macrogroup, but did not identify stressors separately for each habitat system, with the exception of freshwater aquatic habitats (River and Streams, and Lakes and Ponds) where we identified stressors separately for each of systems. Unlike our approach for SGCN, we assigned all 7 stressor characteristics for each habitat – stressor combination.

We assigned 38 unique stressors to 190 Priority 1 and 2 SGCN species, for a total of 1,108 SGCN – stressor combinations. Habitat Shifting or Alteration, Lack of Knowledge, and Fishing

and Harvesting of Aquatic Resources were identified as stressors for the largest number of total SGCN. Lack of Knowledge, Agricultural and Forestry Effluents, and Fishing and Harvesting of Aquatic Resources were identified as medium-high or high priority stressors for the largest number of SGCN. We assigned 31 unique stressors to 34 habitats macrogroups, for a total of 342 habitat – stressor combinations. Invasive Non-native/Alien Species/Diseases, Roads and Railroads, and Housing and Urban Areas were assigned to the largest number of habitats.

Differences from Maine's 2005 Comprehensive Wildlife Conservation Strategy are discussed.

INTRODUCTION

In previous chapters, we summarized what we know about the abundance and distribution of Maine's fauna, described how we selected Species of Greatest Conservation Need (SGCN), and described how we identified and characterized Maine's key habitats. In this chapter, we outline how we integrated this information with information on problems facing SGCN and their habitats.

The problems that impact SGCN are often multi-faceted, with a variety of ultimate and proximate causes that lead to negative impacts on a species' habitat, behavior, or health. In some cases, issues that have negative impacts for some species, such as a particular type of agriculture, may be highly beneficial to other species. Therefore, the factors that impact SGCN must be considered thoughtfully, with recognition that measures designed to resolve problems faced by one species may have negative implications for others. This is especially important in Maine, where much of the state is privately owned and managed for the production of forestry or agricultural products; invariably these activities are less impactful on SGCN than alternate land uses, such as commercial development. Nonetheless, identifying problems for SGCN and their habitats is a fundamental step towards developing meaningful Conservation Actions that will have the greatest benefit for the full suite of SGCN that are present in Maine.

Differences from Maine's 2005 Comprehensive Wildlife Conservation Strategy

In 2005, MDIFW used a variety of international, national, regional, and state plans and initiatives to compile information on the problems impacting SGCN and their habitats. Efforts were focused on Priority 1 and Priority 2 species, with some attention also given to Priority 3 species in certain taxonomic groups. The plan identified the major known threats to each SGCN, with recognition that additional threats existed that were poorly understood or were of relatively low priority. The information was descriptive, and did not follow a standardized approach for threat categorization or nomenclature.

In this plan, we made several revisions to our approach for identifying problems for SGCN and their habitats, including:

- Replaced the term 'threat' with 'stressor' to acknowledge that factors that are a problem for some SGCN may be beneficial for others, and that the term 'threat' has a negative connotation.
- In addition to identifying stressors for habitats, we identified stressors for Priority 1 and Priority 2 SGCN, but not Priority 3 species.

- Utilized the International Union for the Conservation of Nature (IUCN) Threat Classification Scheme to categorize stressors.
- Used an adapted version of Table 7 (*Threat characteristics and categorical ratings*) from The Northeast Lexicon to identify characteristics for each stressor assignment.
- Categorized SGCN stressors as either Low, Medium, Medium-High, or High priority for Action.

Assigning Stressors – General Considerations

Although Maine's Wildlife Action Plan is ultimately intended to benefit SGCN, our plan focuses much attention on that habitats used by these species. This coarse filter – fine filter approach to conservation ensures that, where possible, individual conservation initiatives benefit multiple species, while also acknowledging that some species require individualized attention. In keeping with this approach, we assigned stressors to both habitats and to SGCN, in order to clearly identify the issues that should be addressed at each level in the conservation hierarchy. We assumed that the stressors identified for habitats would apply to the SGCN that used those habitats, reducing or eliminating the need to assign these same stressors to individual SGCN. To advance our goal of developing a highly prioritized, streamlined Action Plan, we used a strategic approach to identify stressors to SGCN that included assignment of only those stressors that are currently having, or in the near future are likely to have, a significant impact on high priority SGCN (see section 5.1.4 for further detail).

To identify stressors specific to SGCN species and their habitats, we consulted international, national, regional, and state plans and initiatives, including Maine's 2005 Comprehensive Wildlife Conservation Strategy. We also consulted recent scientific literature, particularly for marine species, which were not fully included in Maine's 2005 Plan. Our knowledge base of threats was also supplemented from our comprehensive species planning process. As part of the planning process, we develop species assessments for individual species or groups of species, which require the author (species expert) to identify known threats to the species and their habitats. Other species experts review these assessments and provide additional input, and the species public working group further identifies threats to the species and its habitats as they develop species management goals and objectives. We also relied on species experts within MDIFW and DMR, who through years of experience and accumulated knowledge, have become very familiar with the threats facing the species they work with. Finally, Conservation Partners were given the opportunity to critique these tables and provide further input, which several chose to do. For more detailed information on sources we consulted, please refer to the *Literature Cited and References* section of this document.

Although we sought to identify the major, known threats to each SGCN and habitat, we know that there may be threats that we did not list. Also, our knowledge of some species is very limited, and consequently we may not clearly understand the threats they face.

Stressor Classification and Characteristics

As with most other states in the Northeast, we identified stressors using the International Union for the Conservation of Nature (IUCN) Threat Classification Scheme (<http://www.iucnredlist.org/technical-documents/classification-schemes/threats-classification-scheme>). This classification scheme was developed to provide conservationists with a universal menu of terminology to describe the “proximate human activities or processes that have impacted, are impacting, or may impact the status of the taxon being assessed” (IUCN 2015).

The IUCN classification scheme is hierarchical, and includes 11 primary (Level 1) threat categories, 44 secondary (Level 2) categories, and 76 tertiary (Level 3) categories. The categories are customizable, and may be expanded at each level in the hierarchy if doing so is necessary to adequately describe the impact being assessed. Although some categories are not applicable to Maine (e.g. earthquakes, volcanoes), an initial assessment of the IUCN hierarchy determined most factors that negatively impact SGCN in our state were included in the classification system. Table 3.1 contains a list of the IUCN Level 2 threat categories that were determined to impact SGCN and their habitats in Maine, a brief description of those stressors, and where applicable, examples of positive impacts that the stressor may have for wildlife.

While the IUCN system is useful for categorizing stressors to SGCN and their habitats, and will ultimately allow multi-state summaries of these factors across the Northeast region, we found that the system lacks the resolution to clearly identify the specific issues that should be considered for conservation attention. Therefore, when assigning stressors we chose to adopt the primary and secondary IUCN categories (e.g. the first and second levels of the hierarchy), but replaced the tertiary category with a detailed narrative that fully describes the issue and its impact on the species or habitat being considered. This approach provided more detailed information on the stressor than the IUCN system allows, which we ultimately found important when considering whether stressors should be addressed with conservation actions.

In addition to identifying stressors using a modified version of the IUCN system, we adapted Table 7 (*Threat characteristics and categorical ratings*) from The Northeast Lexicon to identify characteristics for each stressor assignment (The Northeast Lexicon 2013). This table presents six Threat Characteristics that can be used to help describe the specific nature of a particular stressor: Severity, Reversibility, Immediacy, Spatial Extent, Certainty, and Likelihood. Each characteristic can be identified as having a low, moderate, or high level of impact (Table 3.2). We added an additional characteristic – Actionability – in order to more explicitly indicate the relative ease with which the impact of the stressor could be addressed through prevention, restoration, or mitigation. We determined that a stressor is Actionable if either the stressor itself, or the impact of the stressor, can be reversed, prevented, or mitigated in some way. Conceptually, Actionability is similar to, but distinct from the concept of 'Reversibility'. While 'Reversibility' considers only whether the impact of the stressor can be reversed once it occurs, 'Actionability' incorporates the idea that preventing or mitigating the impact of a stressor can be just as effective, and in some cases more desirable, than reversing the impact once it has already occurred.

Table 3.1. Nomenclature, Descriptions, and Examples of Positive Impacts on Wildlife for IUCN Threat Categories assigned to SGCN and Habitats in Maine.

IUCN Threat Category	Description	Example of Positive Impact on Wildlife
<u>Residential and Commercial Development</u>		
Housing and Urban Areas	Human cities, towns, and settlements including non-housing development typically integrated with housing	Some species are adept at utilizing human-food sources and habitats provided in residential areas
Commercial and Industrial Areas	Factories and other commercial centres	Large commercial buildings may provide nesting habitat for some species (e.g. Peregrine Falcons)
Tourism and Recreational Areas	Tourism and recreation sites with a substantial footprint	These areas often enhance the public’s perceptions of wildlife and the outdoors, which is important to building support for conservation
<u>Agriculture and Aquaculture</u>		
Annual and Perennial Non-timber crops	Crops planted for food, fodder, fibre, fuel, or other uses	Provides forage for a wide variety of wildlife species
Livestock Farming and Ranching	Domestic terrestrial animals raised in one location on farmed or non-local resources (farming); also domestic or semi-domesticated animals allowed to roam in the wild and supported by natural habitats (ranching)	Maintains grassland habitat required by many wildlife species
Marine and Freshwater Aquaculture	Aquatic animals raised in one location on farmed or non-local resources; also hatchery fish allowed to roam in the wild	Reduces reliance on wild-caught fish for human consumption
<u>Energy Production and Mining</u>		
Oil and Gas Drilling	Exploring for, developing, and producing petroleum and other liquid hydrocarbons	
Mining and Quarrying	Exploring for, developing, and producing minerals and rocks	

Renewable Energy	Exploring, developing, and producing renewable energy	Reduces reliance on non-renewable energy sources
<u>Transportation and Service Corridors</u>		
Roads and Railroads	Surface transport on roadways and dedicated tracks	
Utility and Service Lines	Transport of energy & resources	Provides early successional habitat important for some wildlife (e.g. New England Cottontail)
Shipping Lanes	Transport on and in freshwater and ocean waterways	
<u>Biological Resource Use</u>		
Hunting and Collecting Terrestrial Animals	Killing or trapping terrestrial wild animals or animal products for commercial, recreation, subsistence, research or cultural purposes, or for control/persecution reasons; includes accidental mortality/bycatch	Important wildlife management tool to help prevent overabundant wildlife populations
Gathering Terrestrial Plants	Harvesting plants, fungi, and other non-timber/non-animal products for commercial, recreation, subsistence, research or cultural purposes, or for control reasons	Can increase society’s connection with wildlife, often leading to increased support for conservation
Logging and Wood Harvesting	Harvesting trees and other woody vegetation for timber, fibre, or fuel	Provides wildlife habitat for many species by altering forest structure and composition
Fishing and Harvesting of Aquatic Resources	Harvesting aquatic wild animals or plants for commercial, recreation, subsistence, research, or cultural purposes, or for control/persecution reasons; includes accidental mortality/bycatch	Can increase society’s connection with wildlife, often leading to increased support for conservation
<u>Human Intrusions and Disturbance</u>		
Recreational Activities	People spending time in nature or traveling in vehicles outside of established transport corridors, usually for recreational reasons	Improves society’s connection with wildlife, often leading to increased support for conservation

War, Civil Unrest and Military Exercises Actions by formal or paramilitary forces without a permanent footprint

Work and Other Activities People spending time in or traveling in natural environments for reasons other than recreation or military activities

Natural Systems Modifications

Fire and Fire Suppression Suppression or increase in fire frequency and/or intensity outside of its natural range of variation

Fire (both natural and prescribed) can enhance some wildlife habitats and is required for regeneration in some forest types

Dams and Water Management/Use Changing water flow patterns from their natural range of variation either deliberately or as a result of other activities

Other Ecosystem Modifications Other actions that convert or degrade habitat in service of “managing” natural systems to improve human welfare

Invasive and Other Problematic Species, Genes and Diseases

Invasive Non-native/Alien Species/Diseases Harmful plants, animals, pathogens and other microbes not originally found within the ecosystem(s) in question and directly or indirectly introduced and spread into it by human activities

Problematic Native Species/Diseases Harmful plants, animals, or pathogens and other microbes that are originally found within the ecosystem(s) in question, but have become “out-of-balance” or “released” directly or indirectly due to human activities

Problematic Species/Diseases of Unknown Origin Harmful plants, animals, or pathogens and other microbes of unknown origin.

Viral/Prion-induced Diseases Viruses are small infectious agents that replicate only inside the living cells of an organism. Prions are infectious agents composed of protein in a misfolded form.

Pollution

Domestic and Urban Waste Water	Water-borne sewage and non-point runoff from housing and urban areas that include nutrients, toxic chemicals and/or sediments
Industrial and Military Effluents	Water-borne pollutants from industrial and military sources including mining, energy production, and other resource extraction industries that include nutrients, toxic chemicals and/or sediments
Agricultural and Forestry Effluents	Water-borne pollutants from agricultural, silvicultural, and aquaculture systems that include nutrients, toxic chemicals and/or sediments including the effects of these pollutants on the site where they are applied
Garbage and Solid Waste	Rubbish and other solid materials including those that entangle wildlife
Air-Bourne Pollutants	Atmospheric pollutants from point and nonpoint sources
Excess Energy	Inputs of heat, sound, or light that disturb wildlife or ecosystems

Climate Change and Severe Weather

Habitat Shifting or Alteration	Major changes in habitat composition and location	Changing habitat composition will benefit species that utilize the new habitat type
Droughts	Periods in which rainfall falls below the normal range of variation	
Temperature Extremes	Periods in which temperatures exceed or go below the normal range of variation	
Storms and Flooding	Extreme precipitation and/or wind events	Wind events can result in the creation of early successional habitats, benefiting some wildlife species

Table 3.2. Characteristics and rankings used to summarize stressors assigned to SGCN and Habitats. Adapted from the Northeast Lexicon (2013).

Stressor Characteristic	Low Impact	Moderate Impact	High Impact
Severity	Slight Severity: Degree of ecological change is minor	Moderate Severity: Degree of ecological change is substantial	Severe: Degree of ecological change is major
Actionability (Consider the likelihood of implementing Conservation Actions to begin reducing the impact of the Stressor within the next 10 years)	Actionable with Difficulty: Impacts of a Stressor can only be minimally reversed, prevented, or mitigated, and cost or logistics make solutions difficult to implement	Moderately Actionable: Impacts of a Stressor can be reversed, prevented, or mitigated, however solutions are only partially effective <u>or</u> may be difficult to implement	Highly Actionable: Impacts of the Stressor can be reversed, prevented, or mitigated with proven strategies, at relatively low costs and with few logistical difficulties
Reversibility (Consider the likelihood of reversing the impacts within 10 years)	Reversible: Effects of the threat can be reversed by proven actions	Reversible with difficulty: effects of the threat may be reversed but costs or logistics make action impractical	Irreversible: Effects of the threat are irreversible
Immediacy (This characteristic assesses the time scale over which impacts of the threat will be observable)	Long-term: Effects of the threat are expected in 10-100 years given known ecosystem interactions or compounding threats	Near-term: Effects of the threat are expected within the next 1-10 years	Immediate: Effects of the threat are immediately observable (current or existing)
Spatial Extent (Consider the impact of threat within 10 years)	Localized: (<10%) A small portion of the habitat or population is negatively impacted by the threat.	Dispersed or Patchy: (10-50%)	Pervasive: (>50%) A large portion of the habitat or population is negatively impacted by the threat.
Certainty (This characteristic is used to assess the certainty surrounding the threat and its impacts)	Low Certainty: threat is poorly understood, data are insufficient, or the response to threat is poorly understood	Moderate Certainty: some information describing the threat and ecological responses to it is available, but many questions remain	High Certainty: Sufficient information about the threat and ecological responses to it is available
Likelihood (Consider impact of the threat within 10 years.)	Unlikely: Effects of the threat are unlikely to occur (less than 30% chance)	Likely: effects of threat are likely to occur (30-99% chance)	Occurring: effects of the threat are already observable (100% chance)

Assigning and Prioritizing Stressors for SGCN

We assigned stressors to Priority 1 and Priority 2 SGCN, and assigned ‘Severity’ and ‘Actionability’ characteristics for each of Stressor – SGCN interaction (Table 5.2). The concepts of Likelihood, Certainty and Spatial Extent were considered implicitly, and only those Stressors that were determined to have a moderate or high impact for each of these characteristics were assigned. In addition, only those stressors with moderate or high severity were assigned to SGCN. Using this approach, those stressors with low importance for a particular species were excluded from further consideration, in recognition that these low-priority issues were not likely to be considered for conservation action if they only impacted a single SGCN or were not impacting a habitat itself.

In addition, we developed a simple matrix to prioritize SGCN stressors, using the combination of the Impact scores for ‘Severity’ and ‘Actionability’ (Figure 3.1). These priority levels were considered during the assignment of Conservation Actions (see Element 4).

Figure 3.1. SGCN Stressor Priority Level based on Severity and Reversibility.

		<u>Severity</u>	
		Moderate	Severe
<u>Actionability</u>	Highly Actionable	Medium - High	High
	Moderately Actionable	Medium	Medium - High
	Actionable with Difficulty	Low	Low

Assigning Stressors for Habitats

We identified stressors for terrestrial and freshwater aquatic habitats using Anderson et al. (2013) as our primary source of reference material. Because no single comprehensive source is available that describes that state of marine habitats along Maine’s coast, we used a wide variety of scientific publications, which are listed in the Literature Cited, to compile information on stressors. We assumed that the habitat systems within each terrestrial and marine macrogroup all faced similar conservation problems; therefore we assigned stressors to each macrogroup, but did not identify stressors separately for each habitat system. However, because we determined that the macrogroups for freshwater aquatic habitats (River and Streams, and Lakes and Ponds) were too coarse for assigning stressors in a meaningful way,

we identified stressors separately for each of these systems. Unlike our approach for SGCN, we assigned all 7 stressor characteristics (Table 3.2) for each habitat – stressor combination. Although we acknowledge that there may be stressors that we did not list, we attempted to assign all known stressors for each habitat, regardless of severity or impact level for other characteristics. Our stressor assignments for habitats were intended to be comprehensive, in recognition that over the long term, relatively minor problems within a habitat could have important implications for large numbers of SGCN. In addition, this approach increased the likelihood that a problem would be identified for potential conservation attention if it impacted a species' habitat, even if it was not assigned for an SGCN because it was of slight severity.

STRESSORS TO SGCN

We assigned 38 unique stressors to 190 Priority 1 and Priority 2 SGCN species, for a total of 1,108 SGCN – stressor combinations. Because of the complexity of species-specific stressors and the sheer volume of information, we do not attempt to summarize and discuss all stressors, but instead refer the reader to reports for individual species. However, for ease of reference, we developed Table 3.3, which includes a list of the Secondary (Level 2) IUCN threat categories and the number of Priority 1 and 2 SGCN, as well as the number of Habitat Macrogroups, that were associated with each category. Complete stressor reports can be downloaded by clicking on the hyperlinks embedded within the table.

Habitat Shifting or Alteration, Lack of Knowledge, and Fishing and Harvesting of Aquatic Resources were identified as stressors for the largest number of total SGCN, affecting 109, 109, and 69 species, respectively (Table 3.3). Each of these stressors impacted more than one-third of all Priority 1 and Priority 2 SGCN, indicating that they are wide-spread, pervasive issues that occur across taxonomic groups. However, a simple evaluation of the numbers of species impacted by each stressor does not necessarily translate into priority for conservation attention. In fact, our assessment indicated that a relatively small number of SGCN stressors were both highly severe and highly actionable, resulting in a high priority ranking (Fig. 3.2). Only 30% of SGCN stressors were classified as either high or medium-high priority for action, indicating that they were both severe enough to warrant immediate attention, and that solutions are available to mitigate, reverse, or prevent the impact of the stressor. In fact, of the 38 unique stressors that were assigned to SGCN, only 27 were determined to be of medium-high or high priority for one or more species.

Lack of Knowledge, Agricultural and Forestry Effluents, and Fishing and Harvesting of Aquatic Resources were identified as medium-high or high priority stressors for the largest number of SGCN (Table 3.4). Interestingly, Habitat Shifting or Alteration, which was found to impact a large number of SGCN, was identified as a priority stressor for only one SGCN. In most cases, impacts from Habitat Shifting or Alteration were related to changes in habitat that will occur as a result of predicted levels of climate change. Common examples include the direct impacts of increasing seawater temperatures on coastal species, effects of shifts in forest composition on terrestrial species, and loss of saltmarsh habitat due to sea level rise. Although these effects are diverse and statewide in scope, most are not highly actionable at the level of individual

SGCN within the scope of an individual state's Wildlife Action Plan, or are not predicted to have severe impacts on those species. However, we fully recognize the long-term implications of climate change for SGCN in Maine, and address these issues more fully at the coarse-filter (habitat) scale. We also refer readers to Whitman et al. (2013) for more information on the potential impacts of climate change on SGCN and their habitats in Maine.

Table 3.3. IUCN Threat Category and the Number of Priority 1 SGCN, Priority 2 SGCN, and Habitat Macrogroups associated with each category. Complete stressor reports can be downloaded by clicking on the hyperlinks embedded within the table.

Threat Category	Priority 1 SGCN	Priority 2 SGCN	Total SGCN	Habitat Macrogroups
Housing and Urban Areas.pdf	27	34	61	20
Commercial and Industrial Areas .pdf	20	17	37	19
Tourism and Recreational Areas.pdf	5	0	5	6
Annual and Perennial Non-timber crops.pdf	9	18	27	7
Livestock Farming and Ranching.pdf	3	3	6	0
Marine and Freshwater Aquaculture.pdf	1	0	1	6
Oil and Gas Drilling.pdf	9	12	17	5
Mining and Quarrying.pdf	8	10	18	0
Renewable Energy.pdf	13	16	29	7
Roads and Railroads.pdf	16	24	40	10
Utility and Service Lines.pdf	5	3	8	19
Shipping Lanes.pdf	4	4	8	16
Hunting and Collecting Terrestrial Animals.pdf	4	4	8	11
Gathering Terrestrial Plants.pdf	0	0	0	0
Logging and Wood Harvesting.pdf	12	16	28	0
Fishing and Harvesting of Aquatic Resources.pdf	21	48	69	1
Recreational Activities.pdf	22	28	50	9
War, Civil Unrest and Military Exercises.pdf	2	4	6	11
Work and Other Activities.pdf	1	1	2	18
Fire and Fire Suppression.pdf	3	16	19	0
Dams and Water Management-Use.pdf	19	15	34	0
Other Ecosystem Modifications.pdf	5	5	10	5

Invasive Non-native-Alien Species-Diseases.pdf	25	39	64	8
Problematic Native Species-Diseases.pdf	8	15	23	0
Problematic Species-Diseases of Unknown Origin.pdf	1	2	3	29
Viral-Prion-induced Diseases.pdf	0	2	2	9
Diseases of Unknown Cause.pdf	0	1	1	0
Domestic and Urban Waste Water.pdf	12	24	36	1
Industrial and Military Effluents.pdf	23	40	63	2
Agricultural and Forestry Effluents.pdf	14	53	67	0
Garbage and Solid Waste.pdf	5	7	12	19
Air-Bourne Pollutants.pdf	4	2	6	18
Excess Energy.pdf	3	7	10	17
Habitat Shifting or Alteration.pdf	33	76	109	7
Droughts.pdf	6	2	8	3
Temperature Extremes.pdf	20	45	65	0
Storms and Flooding.pdf	15	13	28	0
Other Threat.pdf	0	6	8	0
Lack of knowledge.pdf	31	78	109	0

Unlike Climate Change, Lack of Knowledge is often highly actionable at the level of individual SGCN, and in many cases is one of the most severe stressors impacting species in Maine. In particular, Maine's invertebrate and marine fauna are generally poorly studied, and little information exists to describe distribution, trends in abundance, or limiting factors. Gathering basic ecological information on these species will be fundamental to advancing their conservation over the next 10 years.

The types of Agricultural and Forestry Effluents that impact SGCN in Maine are diverse, and include pesticides, excessive nutrients, sedimentation, and the release of heavy metals. Many insect SGCN can be negatively impacted by the application of pesticides intended to control other species. Although these effects can be severe, they are often highly actionable through slight modifications to pesticide application methods, changes in the types of pesticides used, or in some cases, use of alternate pest control methods. Freshwater Aquatic and Marine habitats, and their associated SGCN, are often sensitive to declines in water quality, which can be caused by both point-source and non point-sources. Excessive nutrients and sedimentation from agricultural activities (both crop and livestock operations) and aquaculture facilities can cause elevated algae growth and lead to reduced levels of dissolved oxygen. Slight changes to

farming practices are often sufficient to reduce nutrient and sediment migration to aquatic habitats, and many programs currently exist to assist agricultural producers with these efforts.

Fishing and Harvesting of Aquatic Resources was identified as a medium-high or high priority stressor for 39 SGCN. In most cases, these impacts were related to overfishing of commercial species or accidental by-catch of non-target species. Often, these are historic impacts that have largely been addressed through changes in regulations or fishing practices, however stocks of some species are slow to recover. Commercial fishing is a staple industry in Maine, and addressing past and current impacts will require close collaboration between government agencies and the commercial fishing industry

Figure 3.2. Number of SGCN stressor assignments categorized as low, medium, medium-high, and high priority.

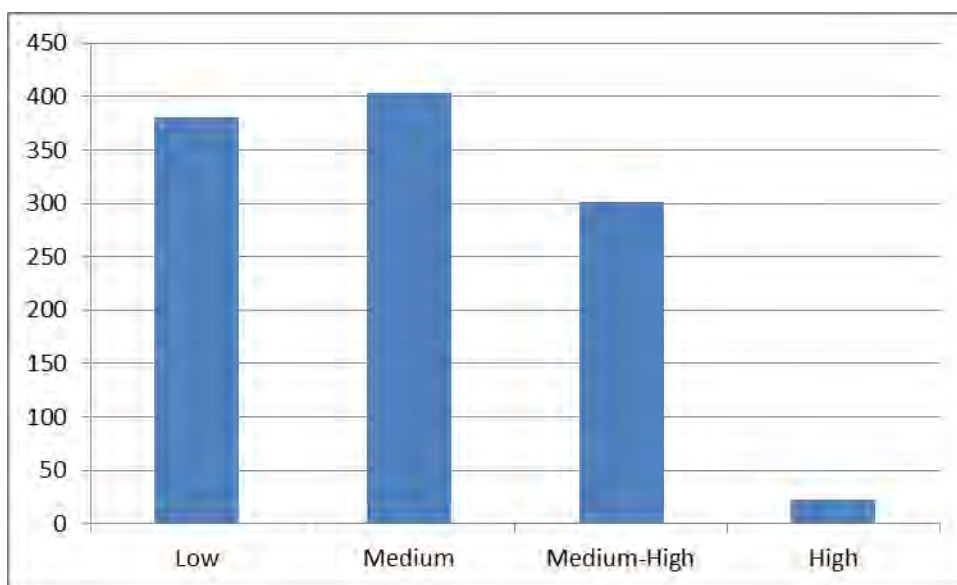


Table 3.4. Secondary IUCN Threat Categories and the number of Priority 1 and Priority 2 SGCN assigned to each category where the stressor was ranked as either high or medium-high priority for action.

IUCN Threat Category	Number of SGCN Assignments
Agricultural and Forestry Effluents	46
Commercial and Industrial Areas	3
Dams and Water Management/Use	11
Diseases of Unknown Cause	1
Domestic and Urban Waste Water	19
Fire and Fire Suppression	13

Fishing and Harvesting of Aquatic Resources	39
Habitat Shifting or Alteration	1
Housing and Urban Areas	25
Hunting and Collecting Terrestrial Animals	1
Industrial and Military Effluents	18
Invasive Non-native/Alien Species/Diseases	2
Lack of knowledge	73
Livestock Farming and Ranching	1
Logging and Wood Harvesting	8
Marine and Freshwater Aquaculture	1
Mining and Quarrying	1
Other Ecosystem Modifications	4
Other Threat	1
Problematic Native Species/Diseases	7
Recreational Activities	20
Renewable Energy	11
Roads and Railroads	12
Storms and Flooding	5
Tourism and Recreational Areas	1
Utility and Service Lines	1
Viral/Prion-induced Diseases	1

STRESSORS TO HABITATS

We assigned 31 unique stressors to 34 habitats macrogroups, for a total of 342 habitat – stressor combinations. Similar to SGCN, we do not attempt to summarize and discuss all stressors, but instead refer the reader to reports for individual habitats, and to Table 3.3 which includes links to summary reports for each stressor.

Invasive Non-native/Alien Species/Diseases, Roads and Railroads, and Housing and Urban Areas were assigned to the largest number of habitats. Although all of these issues occur statewide and have the potential to impact virtually every habitat in Maine, their impacts on SGCN differ markedly.

Impacts from Invasive Non-native/Alien Species/Diseases are most commonly related to invasive plant and animal species that degrade habitats or directly displace native species through competition or predation. These issues tend to be more prevalent in southern Maine, where higher human populations and a moderate climate facilitate expansion of non-native

species. In the marine environment, green crabs are a prevalent invasive species with deleterious impacts on a variety of habitats and SGCN. In some cases, non-native diseases, such as white-nosed syndrome in bats, have also had devastating impacts on SGCN. Impacts from this stressor can be severe, and in many cases it is extremely difficult to reverse the spread of invasive species or diseases; prevention is often the only feasible solution.

In contrast, Roads and Railroads tend to impact habitats through fragmentation, especially for aquatic species, and by altering hydrology. Improperly installed culverts can prevent or reduce passage by many SGCN, reducing connectivity between habitat patches. Both roads and railroads can also impede water flowage in seepage forests, tidal marshes, mudflats, and floodplains, reducing the function of these habitats. Construction of new roads and railroads is not prevalent in most of Maine, so addressing impacts from this stressor typically involves partial reconstruction of existing infrastructure through installation of improved culverts and bridges.

Development of Housing and Urban Areas is most prevalent in southern Maine, where most of Maine's human population lives, and where populations are expected to increase over the next two decades (Maine Office of Policy and Management 2015). Conversion of forest or agricultural land to residential areas results causes a net loss of habitat for most species, although some SGCN are capable of adapting to development. In many cases, secondary impacts from development, such as increases in pollution, off-leash pets, traffic volumes, and even foot traffic, can have greater impacts on SGCN than the development itself. Outside of southern Maine, human populations are predicted to stabilize or decline over the next 20 years, so future impacts from housing development are likely to be localized and should have relatively minor impacts on SGCN.

KEY TO ACRONYMS

IUCN	International Union for the Conservation of Nature
SGCN	Species of Greatest Conservation Need

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Table 3.3. IUCN Threat Category and the Number of Priority 1 SGCN, Priority 1 SGCN, and Habitat Macrogroups associated with each category. Complete stressor reports can be downloaded by clicking on the hyperlinks embedded within the table.

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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.

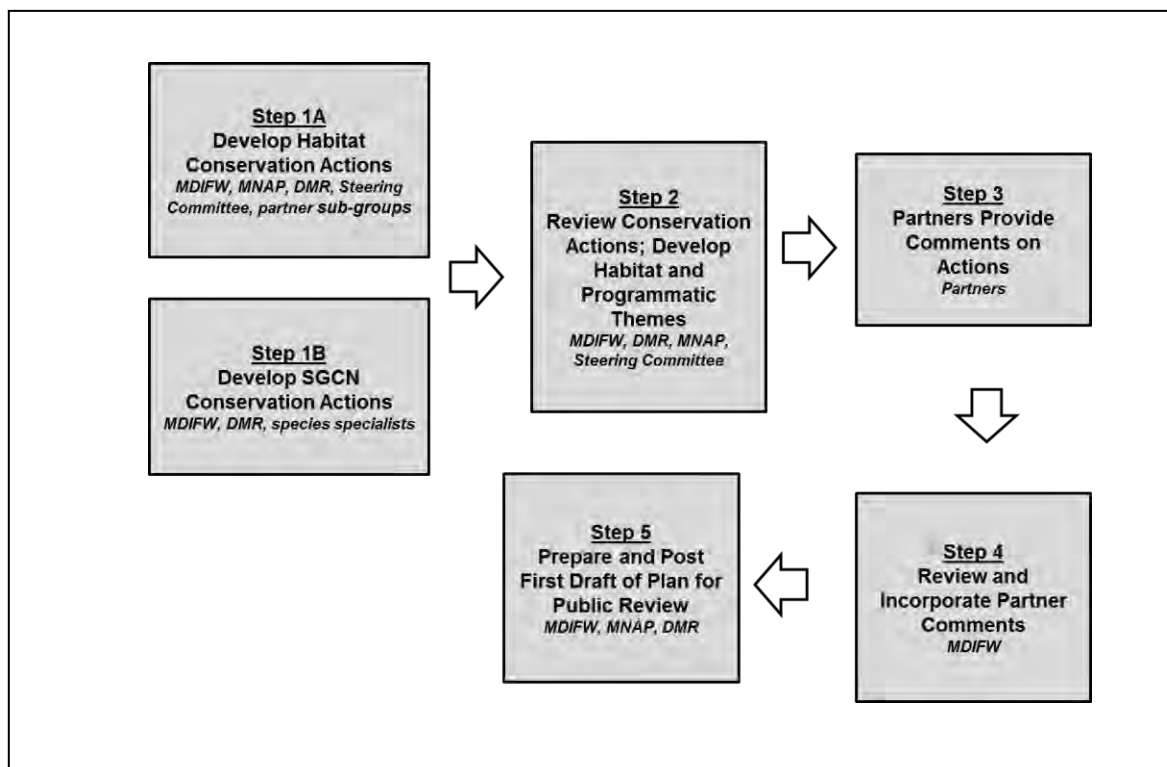
Below are additional major differences in the identification, development, and implementation of conservation actions in the 2015 Action Plan. Specifically, we:

- 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 habitats 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.

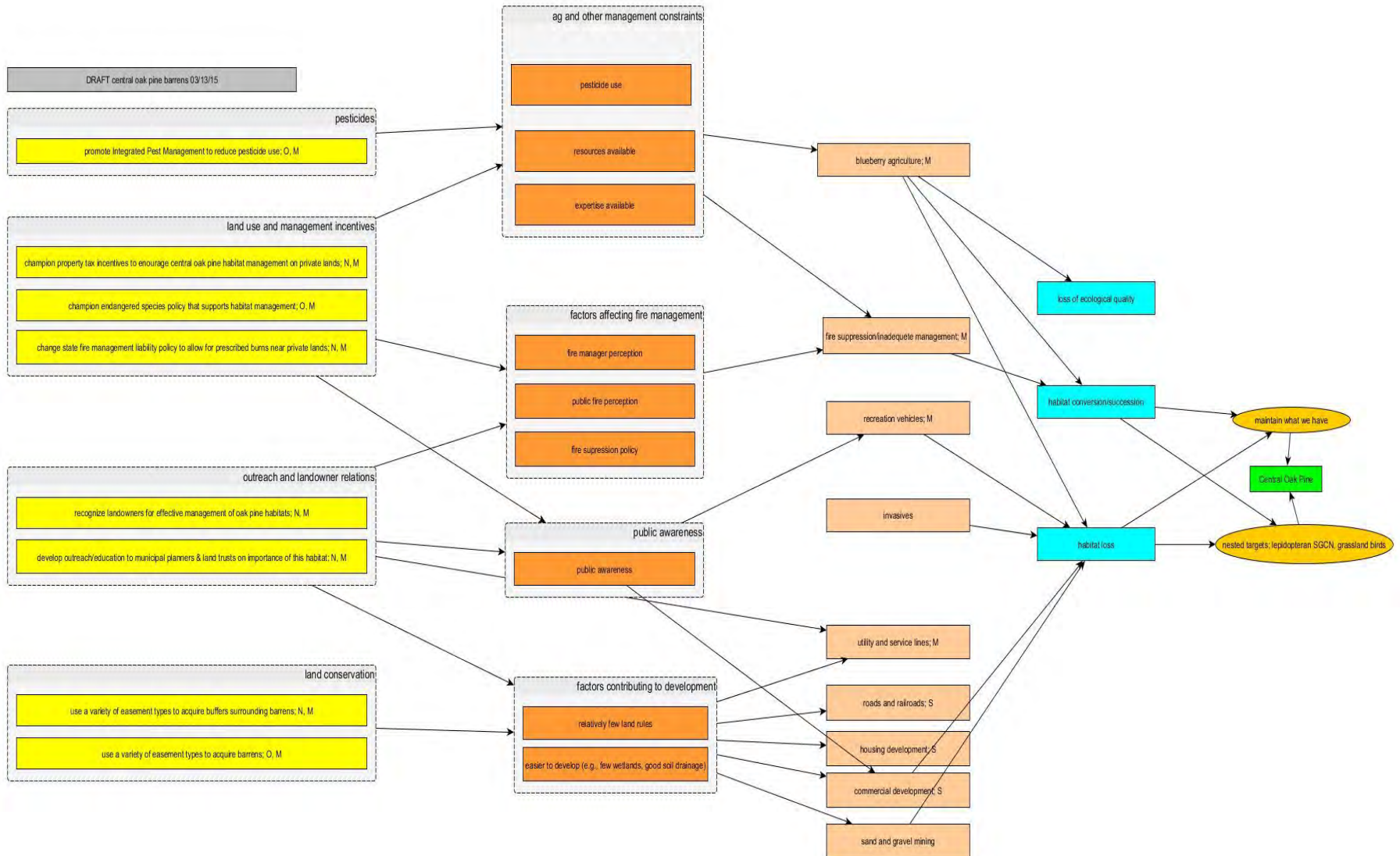
We recognize that certain activities labeled 'stressors' to certain habitats or SGCN can also have positive effects or no effect at all. For example, aquaculture activities like shellfish seeding can help improve water quality and help form substrate for important habitat like eelgrass.

- 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

¹SGCN 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.

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

³Cell 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 PROGRAMMATIC 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 <i>Beginning with Habitat</i> 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 (<i>tentative</i>)		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

Taxonomic 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
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
				Increase 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

				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, and examine 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, burning, 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

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
	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, Nelytia pellucidaria, Chaetagnaea 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.

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.

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).
	Survey and Monitoring	High	New	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.				
				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
	Public Outreach	High	On-going	Reduce the use of tributyltin compounds as a biocide and antifouling prophalactic
	Research	High	New	Encourage the use of more targeted fishing gear in order to reduce bycatch and habitat disturbance
	Survey and Monitoring	High	New	Develop molecular tools to identify where specimens are collected.
				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 pre fledging 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, <i>Tringa flavipes</i>	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, <i>Ammodramus nelsoni</i>	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, <i>Falco peregrinus</i>	Public Outreach	Moderate	New
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, <i>Charadrius melodus</i>	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, <i>Progne subis</i>	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, <i>Calidris maritima</i>	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, <i>Calidris canutus rufa</i>	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, <i>Phalaropus lobatus</i>	Policy	High	New	Site wind/tidal energy projects away from mapped red-necked phalarope current or historical staging areas through environmental permit review.
Roseate Tern, <i>Sterna dougallii</i>	Species Management	High	On-going	Increase breeding population distribution and productivity
Rusty Blackbird, <i>Euphagus carolinus</i>	Research	High	New	Examine the food web of boreal forest wetlands and determine the role of aquatic invertebrates (Trichoptera, 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, <i>Ammodramus caudacutus</i>	Habitat Management	High	On-going	Support current Phragmites control efforts in southern 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.
		Moderate	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	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, <i>Tringa solitaria</i>	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, <i>Bartramia longicauda</i>	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, <i>Numenius phaeopus</i>	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 Pondsail, <i>Stagnicola mighelsi</i>	Research	High	New	Examine effects of dams as well as water quality changes from residential and agricultural pollutant and nutrient runoff on bigmouth pondsail 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, <i>Emydoidea blandingii</i>	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, <i>Ambystoma laterale</i>	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 <i>Ambystoma laterale</i> 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, <i>Alasmodonta varicosa</i>	Survey and Monitoring	Critical	On-going	Develop and implement a systematic protocol for monitoring population size, demographics, and trends.
Clayton's Copper, <i>Lycaena dorcas claytoni</i>	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, <i>Cicindela marginipennis</i>	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, <i>Plebejus idas empetri</i>	Research	High	New	Prepare a statewide atlas and conservation assessment.
Early Hairstreak, <i>Erora laeta</i>	Research	High	New	Prepare a statewide atlas and conservation assessment.
Eastern Ribbon Snake, <i>Thamnophis sauritus</i>	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	Moderate	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.
	Species Management	Moderate	New	
Juniper Hairstreak, Callophrys gryneus	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.
Katahdin Arctic, Oeneis polixenes katahdin	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, Siphonisca 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.

Species	Category	Biological Priority	Type	Description
Arctic Charr, <i>Salvelinus alpinus oquassa</i>	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, <i>Esox americanus americanus</i>	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, <i>Etheostoma fusiforme</i>	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

Species	Category	Biological Priority	Type	Description
New England Cottontail, <i>Sylvilagus transitionalis</i>	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, <i>Synaptomys borealis sphagnicola</i>	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

Species	Category	Biological Priority	Type	Description	
Alewife, <i>Alosa pseudoharengus</i>	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 steppass	
		Moderate	New	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	
	Survey and Monitoring	Moderate	On-going	Monitor multiple life stages of river herring to understand which stages may be experiencing high mortality	
American Pelicanfoot, <i>Arrhoges occidentalis</i>	Public Outreach	High	New	Update current and historical habitat maps representing spawning locations for alewife and blueback herring.	
American shad, <i>Alosa sapidissima</i>	Research	Critical	New	Education to increase awareness of how the shell trade can reduce the economic value of natural systems.	
		High	On-going	Conduct population estimates for Saco, Androscoggin, Kennebec/Sebastcook, and Penobscot rivers	
	Species Management	High	On-going	Conduct fishway efficiency studies that focus on shad passage at existing fishways	
	Survey and Monitoring	Moderate	New	On-going	Increase access to historical spawning habitat through effective fish passage or dam removal
				On-going	Ground-truth assumed current spawning habitat state-wide
				On-going	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
			On-going	Determine locations beyond those regularly monitored where American shad passage may be limited by human-made obstructions	
Atlantic salmon, <i>Salmo salar</i>	Research	Critical	On-going	Monitor water chemistry (DO, turbidity, pH, temperature, conductivity) at known spawning grounds during May-July	
	Species Management	High	On-going	Continue to assess the causes of the precipitous decline in Atlantic salmon returning to Maine waters.	
				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, <i>Acipenser oxyrinchus oxyrinchus</i>	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 On-going	Estimate current population size of shortnose and Atlantic sturgeon in major river systems in Maine.
				Determine sex and stage of maturity of shortnose and Atlantic sturgeon
Barndoor Skate, <i>Dipturus laevis</i>	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, <i>Alosa aestivalis</i>	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 steppass
				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, <i>Strongylocentrotus droebachiensis</i>	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 reseeded 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 may 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, <i>Osmerus mordax</i>	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, <i>Isurus oxyrinchus</i>	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, <i>Acipenser brevirostrum</i>	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
	Species Management	High	On-going	Investigate possibility of shortnose and Atlantic sturgeon scute elemental analysis as indicator of river of origin	
				New	Estimate current population size of shortnose and Atlantic sturgeon in major river systems in Maine.
				Determine sex and stage of maturity of shortnose and Atlantic sturgeon	
Smooth Skate, <i>Malacoraja senta</i>	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, <i>Amblyraja radiata</i>	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, <i>Pseudopleuronectes americanus</i>	Research	Moderate	New	Identify areas where 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, <i>Leucoraja ocellata</i>	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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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ELEMENTS 5 AND 6: MONITORING AND REVIEW

Abstract: We outline the methods we will use to monitor SGCN and their habitats, describe how we will monitor the progress made in implementing the Action Plan over the next ten years, and address the procedures we will use to review and update the Action Plan. We work closely with federal, state, and private conservation partners to develop and participate in cooperative species monitoring programs. Where possible, monitoring programs target multiple species, usually within the same taxonomic group. In the pages that follow, we describe the monitoring programs that are in place for SGCN in Maine. We include a table for each of the five taxonomic groups that are referenced throughout this plan.

MDIFW and partners identified habitat-scale survey and monitoring needs during development of conservation actions. We present these actions with examples of existing and general survey and monitoring techniques that could be used to achieve these habitat monitoring objectives.

MDIFW and partners developed 11 programmatic actions to help guide Action Plan implementation over the next ten years. Three of these actions address monitoring and are described in greater detail.

MDIFW will use the programmatic actions to monitor conservation action progress at least annually. MDIFW will also establish an Implementation Committee in the Fall of 2015 comprised of agency staff and conservation partners. This committee will review Action Plan accomplishments and address emerging issues or adaptive management needs. We will undertake a comprehensive plan review beginning in year eight of the 2015 Action.

Differences from Maine's 2005 Comprehensive Wildlife Conservation Strategy are discussed.

INTRODUCTION

In the previous chapter, we discussed Maine's strategies for conserving Species of Greatest Conservation Need (SGCN) and their habitats across the state. Maine's approach is built on a foundation of habitat conservation, which is designed to ensure that adequate habitat remains available in perpetuity to support not only Maine's SGCN, but the full array of wildlife occurring in Maine. Those efforts are supplemented with species-specific conservation actions focused on priority stressors for Priority 1 and Priority 2 SGCN.

In this chapter, we outline the methods we will use to monitor SGCN and their habitats. We also describe how we will monitor the progress made in implementing the Action Plan over the next 10 years. Finally, we address the procedures we will use to review and update the Action Plan.

Differences from Maine's 2005 Comprehensive Wildlife Conservation Strategy

In 2005, MDIFW identified the species-specific monitoring programs that were in place for SGCN, and provided extensive detail on the Department's approach to Species Planning. MDIFW's Species Plans provide a framework for monitoring both individual species and their habitats, and the 2005 CWCS referenced this process as the primary mechanism by which we would conduct this work. For some species that had not been ushered through the formal Species Planning process, the 2005 Plan identified additional programs by which we would assess progress in achieving conservation outcomes. The 2005 Plan also described an approach for monitoring statewide changes in habitat, which focused on the use of satellite imagery to measure changes in land cover.

While this plan follows a similar framework as used in 2005 for monitoring SGCN and their habitats, we made several substantive revisions, including:

- Removed references to MDIFW's Species Planning Process, which has evolved since 2005 and has been replaced by the Wildlife Action Plan as the primary planning tool for SGCN conservation
- Streamlined the descriptions of SGCN monitoring programs, and provided most of this information in tabular format rather than within narrative form
- Added a description of how we will monitor the success of implementing Conservation Actions
- Describe the process we will use to review and update the Plan as required by Congress

MONITORING SGCN

SGCN species run the gamut from species for which we have little information, to those that are intensively monitored through formal, multi-state initiatives. We work closely with federal, state, and private conservation partners to develop and participate in cooperative species monitoring programs. Where possible, monitoring programs target multiple species, usually within the same taxonomic group. In the pages that follow, we describe the monitoring programs that are in place for SGCN in Maine. We include a table for each of the five taxonomic groups that are referenced throughout this plan:

- Birds
- Reptiles, Amphibians, and Invertebrates
- Inland Fish
- Mammals
- Marine

Within each table, we use an 'O' for 'ongoing' to indicate that the species is currently being monitored with the referenced approach, and a 'N' for 'new' to indicate that the species is not currently monitored with the referenced approach, but it could be monitored using this methodology if resources become available.

Birds

Currently, 13 distinct programs are used to monitor 116 of the 129 bird SGCN in Maine (Table 5-1). In addition, 9 bird SGCN are monitored using individual, species-specific protocols. Only 10 bird SGCN are not currently subject to some type of formal monitoring program, although monitoring protocols for 2 of these species (American Oystercatcher and Sedge Wren) may be implemented in the near future.

Many of these protocols are statewide in scope, while others, such as the Christmas Bird Count, and the Breeding Bird Survey, occur nationwide.

The Maine Audubon Annual Loon Count is used to monitor the status of loons on selected water bodies across the state. Maine Audubon coordinates more than 900 volunteers who dedicate the morning of the third Saturday in July to finding and counting loons.

<http://maineaudubon.org/wildlife-habitat/the-maine-loon-project/>

MDIFW staff collaborate with USFWS to implement the Coastal Waterbird Survey, which provides information on the distribution and abundance of several waterbird SGCN. This program consists of a series of aerial surveys of coastal Waterbirds along the entire coast of Maine. Aerial surveys are conducted over several seasons and are supplemented with on-the-ground boat surveys. It is designed to cover each area of the coast every five years.

The Maine Owl Survey uses a series of established survey routes to document the distribution and relative abundance of owls within the state. Trained surveyors make brief roadside stops along survey routes, and play short tapes of owl calls throughout a 15 minutes listening period.

Migratory Shorebird Survey: The Program for Regional and International Shorebird Monitoring (PRISM) is being implemented by a Canada/US Shorebird Working Group and the U. S. Shorebird Council (Bart et al. 2002) and is based on the Canadian and U. S. shorebird conservation plans (Brown et al. 2001, Donaldson et al. 2001). MDIFW is a participant in this monitoring program (Tudor 2000)

The Maine Waterfowl Brood Count is conducted annually by MDIFW and is used as an index of the size of the breeding waterfowl population found in 36 wetlands (Corr 1988)

The Maine Mid-winter Waterfowl Survey is an aerial inventory conducted annually by MDIFW during the first week of January. It is an index to the total number of waterfowl present in Maine each winter (Corr 1988).

The Vermont Institute of Natural Science (VINS) launched Mountain Birdwatch in the spring of 2000 to establish a monitoring program for Bicknell's Thrush and other montane forest birds. Results from this program are used to measure population trends, monitor changes in bird distribution, model potential breeding habitat, identify conservation opportunities, evaluate proposed development, and predict effects of climate change on mountain songbirds.

Reptiles, Amphibians, and Invertebrates

Currently, ten distinct programs are used to monitor 88 of the 145 reptile, amphibian, and invertebrate SGCN in Maine (Table 5.2). In addition, nine of the SGCN in these taxonomic groups are monitored using individual, species-specific protocols. Forty-six of the SGCN are not currently subject to some type of formal monitoring program, although species-specific monitoring protocols for four of these species (Big-tooth Whitelip, Gaspe Gazelle Beetle, Graceful Clearwing, and Spike-lip Crater) may be implemented in the near future.

The Maine Amphibian Monitoring Program (MAMP) is a volunteer-based program that gathers information on the distribution and abundance of calling amphibians, including two SGCN, the mink frog and northern leopard frog (Maine Audubon 2015). The MAMP is a component of the North American Amphibian Monitoring Program, and has been conducted in Maine since 1997. Currently, approximately sixty road-side routes are surveyed across the state, with distinct survey protocols within coastal, interior, and northern portions of the state.

A series of volunteer-based survey and atlas programs are used to monitor many of Maine's invertebrate SGCN. The Maine Butterfly Survey (MBS), Maine Damselfly and Dragonfly Survey (MDDS), Maine Mussel Baseline Atlas, and Maine Bumble Bee Atlas are all designed to collect sighting information from volunteer citizen scientists, to help map the distribution of these species groups across the state. In many cases, these programs are among the first of their kind in the country, and have helped to gather critical information on these understudied and poorly understood taxa. In the future MDIFW hopes to collaborate with partners to develop the Maine Tiger Beetle Atlas, which would gather similar data on three additional SGCN, the Cobblestone Tiger Beetle, the Saltmarsh Tiger Beetle, and the White Mountain Tiger Beetle.

Inland Fish

The 17 inland fish SGCN are all subject to some form of monitoring, through the application of 15 distinct methodologies (Table 5.3). In most cases, individual species are monitored using multiple methods. Many of the monitoring approaches that apply to inland fish SGCN are components of MDIFW's larger fisheries management program implemented by regional biologists, and are not targeted towards specific species. However, species-specific monitoring protocols are in place for six species in this group. In addition, two new monitoring protocols (eDNA and Trawling) may be applicable to several SGCN in the future. In particular, eDNA, which relies on the detection of DNA in water samples to determine the presence or absence of species within the water body, could prove to be an extremely powerful approach for monitoring rare aquatic taxa.

Mammals

Mammals often occur at relatively low density and occupy large landscapes, making the application of comprehensive, multi-species monitoring protocols challenging. Of Maine's fifteen mammal SGCN, four are currently subject to a species-specific monitoring protocol or a multi-species monitoring program (Table 5.4). In addition, a new initiative, the North American Bat Survey, will ultimately be used to monitor all eight bat SGCN. Monitoring protocols for three mammal SGCN (the Penobscot Meadow Vole, the Long-tailed Shrew, and the Northern Bog Lemming) have yet to be developed.

Marine

Marine Mammals and Sea Turtles:

Programs that monitor marine mammals and sea turtles occur largely through reports from entanglements and gear modification studies. The Maine Department of Marine Resources (MDMR) marine mammal strandings program and sightings program was a component of the conservation and monitoring work until the fall of 2011. The program did not receive the necessary federal funding through the Prescott Grant Program and without any state funds to

support the program it was discontinued. The MDMR, in collaboration with the Maine commercial fishing industries, developed a Comprehensive Marine Wildlife Conservation Strategy for Large Whales and Sea Turtles in the State of Maine to reduce the risk posed by these fisheries to right whales and other protected resources. Special disentanglement tools, based on those created for the Large Whale Disentanglement Network, were built for use by the Bureau of Marine Patrol and the advanced trained lobstermen. Recent efforts have focused on understanding baseline amounts of gear, specifically vertical lines, in Maine's lobster fishery seasonally. These efforts gave both state and federal regulators the ability to target potential regulations to areas where they make the most impact for reducing co-occurrence between whales and fishing gear.

MDMR and collaborators at the University of Maine also investigate whale habitat through a monitoring program sampling habitat characteristics in Midcoast and Downeast Maine using plankton and water column sampling. The project will help determine the inshore/offshore and seasonal distributions of *Calanus finmarchicus*, Right Whale prey. Additionally, a Dtag project in Maine coastal fishing habitats was completed that successfully tagged two humpback whales near Mount Desert Island. Dive profiles that show the whales diving to the bottom during foraging events in addition to using the upper 20 meters of the water column.

Finfish: Diadromous, Groundfish, and Ocean Migratory Fish

Both species specific monitoring programs as well as surveys that target multiple species are performed regularly in Maine waters. The Inshore Trawl Survey is a fisheries independent assessment of living resources inside the coastal waters of Maine. Until this survey began in 2000, Maine and New Hampshire were the only states on the east coast not conducting a near shore assessment. While the funding comes from money Congress set aside to provide some economic relief to the groundfish industry, the assessment is more than a groundfish survey. Lobsters, recreational finfish species, and non-commercial species of ecological interest are also assessed. This is truly a multispecies survey that benefits decision makers confronted with issues such as fish stock recovery, fishery management measures, Essential Fish Habitat designations, climate change, Marine Protected Areas and more.

Monitoring programs also include port sampling and reporting from commercial and recreational fishers. During commercial and recreational sampling efforts, biological data including length, weight, and maturity are collected from groundfish, river herring, scallops, urchins, shrimp, and other fished species. MDMR also collects scales and otoliths from fish for ageing.

From May through October, MDMR interviews anglers to estimate of the total number of fish caught, released and harvested; the weight of the harvest; total number of angler trips; and number of people participating in marine recreational fishing in Maine. This part of a National Marine Fisheries Service (NMFS) program (Marine Recreational Information Program) to estimate the impact of recreational fishing on marine resources. Sampling in Washington County continues with the assistance of Maine Sea Grant's Marine Extension Agent and students from the University of Maine at Machias. MDMR staff also target the winter rainbow smelt recreational fishery throughout the state through creel surveys and a catch card program.

MDMR's recreational fishing staff also conduct the NMFS Large Pelagic Survey from July through October to monitor catch and effort of tunas and sharks. This survey consists of dockside vessel interviews and telephone calls to Atlantic Tuna permit holders. Additionally, Volunteer Logbook Programs for Striped Bass and Rainbow Smelt target avid recreational fishers to collect additional information. In this program, anglers record information about fish

harvested or released during each trip, time spent fishing, area fished, number of anglers and target species.

Beach seine surveys in the Kennebec/Androscoggin estuary monitor the abundance of juvenile alosids (shad, alewives, and Blueback Herring), as well as Striped Bass, Rainbow Smelt, and resident species, at 14 permanent sampling sites in the tidal freshwater portion of the estuary and six additional sites in the lower salinity-stratified portion of the river, every other week from mid-May to the end of August. This survey has collected data since 1979 and is used to monitor species assemblages, population trends, and habitat use.

Fish passage efficiency for diadromous species is monitored through collaborative efforts between agencies, universities, and hydropower companies. For example, the U. S. Geological Survey (USGS) Conte Anadromous Fish Research Lab completed three years (2002-2004) of field work on a collaborative project with MDMR, Penobscot Indian Nation, NOAA-Fisheries, and the University of Maine, documenting the upstream migration of adult Atlantic Salmon in the Penobscot River. The research used Passive Integrated Transponder tag technology to gather data on movements of individual adult salmon that can be used to evaluate upstream movements and distribution of salmon within the drainage, the probability that fish are able to access spawning habitat, broodstock management, and the effectiveness of current juvenile stocking practices. Current projects (2014-2015) include monitoring American Shad passage at the Benton Falls Dam on the Sebasticook River and measuring the passage efficiency of fishways in Phippsburg and Bristol for alewife passage.

MDMR conducts routine monitoring of the abundance and status of juvenile and adult diadromous fishes in most of Maine's large watersheds. MDMR operates traps to monitor adult returns on the Penobscot, Narraguagus, and Sebasticook rivers. Brookfield Renewable Energy Group operates traps in the upper Penobscot, the Union River, Kennebec River, Androscoggin River, and the Saco River that provide counts of adult fish and some information on juveniles. The St. Croix Waterway Commission operates a trap on the St. Croix and Algonquin Power operates a trap on the Aroostook River.

Atlantic Salmon monitoring is directed at determining the causes of the precipitous decline in Atlantic salmon returning to Maine waters. Ongoing projects are aimed at determining survival among freshwater life stages and understanding the biological and environmental factors affecting survival. These include parr density and relative abundance, estimates of smolt emigration smolt, smolt physiology, marine and estuarine smolt trawling, and smolt tracking through estuaries. Redd counts are used to track spawning escapement in the Gulf of Maine Distinct Population Segment rivers without adult traps.

Assessments of the population status of Shortnose and Atlantic Sturgeon are performed on the Saco, Kennebec, Androscoggin, and Penobscot rivers and include determining abundance, age structure and recruitment, sampling for sturgeon in areas of historic occurrence, documentation of seasonal distribution and essential habitat, development of criteria to identify critical habitat, designating identifiable habitat for sturgeon populations, ensuring fish passages, and examining the relationship between dam discharge levels and spawning success.

Spawning smelt runs are assessed annually as a source of information on population status. The survey produces a fishery-independent index of abundance by collecting biological data from spawning runs including information about size and age composition, catch-per-unit-effort, and mortality. As part of this project, fyke net stations are sampled at selected coastal rivers

in Maine, New Hampshire, and Massachusetts for monitoring. The project has collected standardized data since 2008.

American Eel are monitored through two fisheries independent surveys, a young-of-year survey and yellow eel count. Each spring, MDMR scientists enumerate all young-of-year (glass) eels that migrate upstream into West Harbor Pond for a period of six weeks, and collect biological information (length, weight, pigmentation) on subsamples. The Yellow Eel survey in the Kennebec River watershed is conducted from June to September each year, at two hydropower facilities on the Sebasticook River and one facility on the Kennebec River. This survey provides an annual index of recruitment (multiple year classes) to the Kennebec River watershed.

Marine Invertebrates:

Marine invertebrates are monitored through efforts by state, federal, university, and non-governmental organizations. In addition to the Nearshore Trawl Survey and port sampling programs described above, MDMR collects information about commercial species through fishery independent surveys.

The northern shrimp population is monitored by multiple surveys. Scientists from NMFS, Maine, New Hampshire, and Massachusetts collaborate to conduct a series of tows for northern shrimp in the Gulf of Maine each summer. The survey data provide fishery independent data that are an important component of the assessment of the Gulf of Maine shrimp stock. In the winter of 2014/2015, in an effort to collect information about winter populations of northern shrimp during the fishery closure, MDMR worked with local fishermen in Maine to collect trawl and trap samples to document the species' maturity schedules and size distribution.

Green Sea Urchins are monitored through dive surveys and larval assessments. MDMR and industry divers count and measure urchins at fixed and random sites each spring from Kittery to Eastport. This survey provides fishery independent data that are used in stock assessments to describe the status of the resource and provide a scientific basis for the development of management measures. To monitor larval settlement, MDMR divers deploy settlement plates at Pemaquid Point each spring, collect them during the summer, and examine the plates in the laboratory to enumerate the number of new young-of-the-year sea urchins. This continues a time series begun at that site in the mid-1990s by the University of Maine, which tracks annual sea urchin larval settlement.

Annual surveys of Horseshoe Crab spawning populations and breeding sites have been conducted since 2001 through a joint effort of the MDMR, several coastal watershed volunteer monitoring groups, and a private contractor. Following the drastic depletion of the resource in the Mid-Atlantic States and the resultant increased harvesting of Maine Horseshoe Crabs, anecdotal information was collected which indicated that Maine populations experienced a decline in recent years. These surveys are intended to provide a much-needed update to the last significant assessment of Maine Horseshoe Crabs and breeding locations, which was conducted in 1977 for the Maine State Planning Office. A visual count of spawning horseshoe crabs is made at three sites along the coast during May and June spring tides. This survey relies heavily on volunteers who walk a standard survey transect at high tide counting crabs observed within a 1 meter band. Since 2005, sites have been reduced from 14 to three for budget reasons. In recent years, the continuance of these surveys has relied entirely on volunteer monitoring.

MDMR and industry partners survey the Maine scallop resource annually, rotating among coastal sites from southern Maine to Quoddy Head. Sampling occurs in October-November

prior to the start of the scallop season in December. The surveys provide fishery independent data that are used in stock assessments to describe the status of the resource and provide a scientific basis for the development of management measures. The surveys also provide information on the effectiveness of the closed areas to help guide re-opening strategies.

The National Park Service monitors rocky shores in Maine as part of their Northeast Temperature Monitoring Network that extends to the Boston Harbor Islands in Massachusetts. In Maine, field work is directed towards Acadia National Park, specifically Ship Harbor, Bass Harbor, Otter Point, Schoodic Point and Little Moose Island. Samplings include some Maine coastal islands (Metinic and Petit Manan Islands). Developed and vetted protocols monitor tide pools, barnacle recruitment, vertical distributions of macroalgae and macroinvertebrates, and counts of target species. This is a long-term, annual sampling program aimed to detect changes in rocky shore fauna and flora on decadal time scales associated with alterations in oceanographic patterns and climate change.

The New England Aquatic Nuisance Species Panel was established in 2001 to monitor, create public outreach programs, suggest policy, and facilitate coordination of these activities among the New England states. While most efforts have targeted freshwater invasives, marine non-native macroalgae and macroinvertebrates species are monitored as part of the Rapid Assessment Survey done by taxonomic experts on floating pontoons and some rocky shores from New York City to Eastport, Maine (Pederson et al. 2005, Wells et al. 2014). Data from these surveys are available from the Massachusetts Invader Tracking and Information System (MITIS; http://mit.sea-grant.net/mitis/mitis_map). Supporting the scientific survey efforts are citizen monitoring programs that increase the spatial and temporal coverage from Rhode Island to Wells, Maine for an abridged list of invasive species. The data collected from 2008 to present are available at the Massachusetts Ocean Resource Information System. http://maps.massgis.state.ma.us/map_ol/moris.php

The incipient network of field station sites called the Field Station and Marine Lab network in the Northeast includes a number of nonprofit and university affiliated coastal stations that monitor rocky and unconsolidated shores in Maine. Some of these projects involve citizen science programs with significant outreach and education. Current stations include the R.S. Friedman Field Station in Cobscook Bay, Hurricane Island in Penobscot Bay, Coastal Studies Center in Casco Bay, and several others.

MONITORING SGCN HABITATS

Many of the SGCN monitoring efforts above also involve some component of habitat monitoring. For SGCN habitats, factors affecting habitat distribution and integrity often occur at regional or even state-wide scales. For example, the health of a headwater stream and its resident SGCN are influenced, in part, by barriers downstream and the watershed as a whole. Likewise, the future distribution of tidal marshes in response to sea level rise (marsh migration) is driven by factors at multiple scales, from individual culverts restricting tidal flow in streams to large-scale sediment accretion dynamics. For other types of habitats, especially marine systems, we simply do not have a clear understanding of current or historic distributions and therefore have limited baseline information to assess changes over time. To address these knowledge gaps, MDIFW and partners identified habitat-scale survey and monitoring needs during development of

conservation actions. We present these actions in Table 5.6 with examples of existing programs (e.g., Stream Smart) and general survey and monitoring techniques (e.g., remote sensing) that could be used to achieve these habitat monitoring objectives. This is not an exhaustive list of approaches but rather a starting place to identify next steps and potential partnerships.

Table 5.6: Proposed habitat monitoring approaches

Habitat Group	Conservation Action Description (Action ID #)	Examples of Potential Monitoring and Survey Programs ¹
Freshwater Aquatic Habitats		
Headwaters and Creeks	<ul style="list-style-type: none"> 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 (#87) 	SGCN and habitat surveys, GIS models, remote sensing
Streams, Rivers, Lakes, and Ponds	<ul style="list-style-type: none"> Complete a statewide inventory of the status and condition of road and railroad crossings, including on headwater streams (#146) Conduct a statewide inventory of dams, including on headwater streams (#101) Identify priority locations for ecological flow management in aquatic habitats (#102) Increase habitat surveys & models for road stream crossings (#145) Develop better methods to map potential barriers in priority watersheds (#103) Track completed road stream crossing projects (#147) 	Stream Smart, stream barrier assessments, GIS models, remote sensing
Marine Habitats		
Coastal	<ul style="list-style-type: none"> 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 (#167) 	SGCN and habitat surveys, Beginning with Habitat
Intertidal	<ul style="list-style-type: none"> Develop monitoring systems and rapid response plans to prevent the colonization of invasive/problematic species and diseases in intertidal, subtidal, and tidal marsh habitats (#217) More frequently update intertidal and subtidal SGCN habitat maps and compare to historical maps to monitor changes in distribution over time (#248) Continued underwater surveillance of potential and active aquaculture lease sites with a focus on SGCN and important habitats (new) 	Maine Invasive Species Network, Beginning with Habitat, eel grass surveys, remote sensing, SGCN and habitat surveys
Rocky Coast	<ul style="list-style-type: none"> Identify and prioritize significant nesting, migratory, and wintering areas in rocky coast habitats for contingency planning (#157) 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 (#158) 	SGCN and habitat surveys, Beginning with Habitat, Maine Invasive Species Network

	<ul style="list-style-type: none"> Identify invasive plant hot spots in rocky coast habitats (#162) 	
Subtidal	<ul style="list-style-type: none"> Develop monitoring systems and rapid response plans to prevent the colonization of invasive/problematic species and diseases in intertidal, subtidal, and tidal marsh habitats (#273) 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 (#266) Expand surveys of recreational fishing efforts to include SGCN that are not targeted in current survey efforts (#283) More frequently update intertidal and subtidal SGCN habitat maps and compare to historical maps to monitor changes in distribution over time (#307) Continued underwater surveillance of potential and active aquaculture lease sites with a focus on SGCN and important habitats (new) 	Maine Invasive Species Network, citizen scientist or volunteer monitoring programs, remote sensing, eel grass monitoring
Tidal Marsh	<ul style="list-style-type: none"> 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 (#177) Develop monitoring systems and rapid response plans to prevent the colonization of invasive/problematic species and diseases in intertidal, subtidal, and tidal marsh habitats (#191) Continue and expand monitoring programs that track tidal marsh changes over time (#185) 	GIS models, remote sensing, salt marsh accretion monitoring, Saltmarsh Habitat and Avian Research Program, Maine Invasive Species Network
Terrestrial and Freshwater Wetland Habitats		
Floodplain Forests	<ul style="list-style-type: none"> Identify aggressive invasives in floodplain forests and pre-treat to prevent spread (#342) 	Maine Invasive Species Network, citizen scientist or volunteer monitoring programs
Freshwater Marshes	<ul style="list-style-type: none"> Identify high priority road segments/culverts for organism passage among freshwater wetlands (#60) 	Road Watch, Beginning with Habitat, SGCN and habitat surveys, GIS models, remote sensing

<p>Grassland-shrubland-early Successional</p>	<ul style="list-style-type: none"> • Research and identify explicit areas and amounts of grassland, shrubland, and early successional habitats needed to conserve target SGCN (#347) • Assist municipal planning, through programs such as Beginning with Habitat, to identify key grassland, shrubland, and early successional SGCN habitats (#348) • Map and distribute information on existing ruderal habitats (#355) • Map potential ruderal habitats (#356) 	<p>GIS models, remote sensing, SGCN and habitat surveys, Beginning with Habitat</p>
<p>Northern Forests and Swamps</p>	<ul style="list-style-type: none"> • 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 (#31) • Identify and conserve boreal forest refugia associated with SGCN (#32) • Continue long-term monitoring of SGCN and SGCN habitats associated with northern forests and swamps (#38) • Continue monitoring for invasive and problematic species and diseases, especially forest insect pests, in northern forest and swamps and south-central forests and swamps (#34) • Continue stewardship/habitat monitoring on conserved northern forest and swamp lands (#30) 	<p>GIS models, remote sensing, SGCN and habitat surveys, Maine Invasive Species Network</p>
<p>Rocky Summits-Outcrops-Mountaintops</p>	<ul style="list-style-type: none"> • 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 (#15) • Continue habitat/recreational monitoring stewardship on conserved rocky summit, outcrop, and mountaintop SGCN habitats (#18) 	<p>GIS models, remote sensing, SGCN and habitat surveys, citizen science or volunteer monitoring programs</p>
<p>South-Central Forests and Swamps</p>	<ul style="list-style-type: none"> • Continue monitoring for invasive and problematic species and diseases, especially forest insect pests, in northern forests and swamps and south-central forests and swamps (#74) • Undertake long-term monitoring of SGCN and their habitats in south-central forests and swamps (#71) • Partner with MaineDOT to identify invasive plant "hotspots" along roads and bridges, especially in south-central forests and swamps (#75) 	<p>Maine Invasive Species Network, citizen science or volunteer monitoring programs</p>

Statewide Habitat and Conservation Action Monitoring

In addition to SGCN and habitat monitoring, we will track habitat trends and the effectiveness of broad conservation programs at the statewide scale. Several of these approaches are described below. We expect to add approaches as new assessment, mapping, landscape modeling, and remote sensing techniques emerge over the next decade.

1. Beginning with Habitat (BwH)

a. **Description:** BwH is a non-regulatory, habitat-based model that provides wildlife and habitat information to local decision-makers, conservation organizations, and landowners interested in their local wildlife and habitat resources. BwH provides users with the necessary habitat information to voluntarily balance growth with conservation of natural spaces needed for wildlife, recreation, agriculture, forestry, and other resources. In the first decade of the program, BwH worked closely with towns to fulfill this goal. Over the next ten years, BwH will continue to work with towns while also providing enhanced/updated online mapping resources, searchable information on SGCN and conservation actions, and increased technical assistance for landowners and others implementing voluntary SGCN conservation measures. Under the direction of the Action Plan Implementation Committee, the BwH Steering Committee will revise BwH's strategic plan over the next two years to include measurable objectives and performance measures to monitor delivery, utilization, and effectiveness of BwH in supporting local voluntary efforts to conserve Maine's wildlife resources.

b. Periodically Assessed Metrics

- i. Number of towns and regions mapped.
- ii. Number of towns, land trusts, and landowners receiving BwH information and technical assistance.
- iii. Ease of access to up-to-date habitat data for all user groups (government agencies, towns, conservation groups, and landowners).
- iv. Number of users accessing online mapping tools.
- v. Development of improved outreach modules for different user groups, especially landowners.
- vi. Number of conserved acres (including easements) in BwH Focus Areas.
- vii. Number of acres in BwH Focus Areas in "Tree Growth" or "Farm and Open Space" current use tax programs.
- viii. Successful creation of new incentives for towns and landowners to conserve priority SGCN habitats.

2. Spatial Data Updates

a. **Description:** Since Maine's 2005 plan, numerous habitat-related spatial datasets have been updated or created by multiple partners. The Maine Office of Geographic Information System data catalog (<http://www.maine.gov/megis/catalog/>) provides many of these datasets to the public, and others are available directly from partners. Several datasets are hosted and maintained by MDIFW and BwH and are listed here. These datasets are updated regularly and can be queried to monitor statewide SGCN, land use, and habitat patterns over time.

b. Periodically Assessed Metrics

- i. Impervious/Developed Areas: Areas of impervious surfaces including buildings and roads.

- ii. Rare, Threatened, and Endangered Wildlife Data (includes some SGCN): Includes known rare, Endangered, and Threatened species occurrences and/or the associated habitats based on species sightings.
- iii. Undeveloped Habitat Blocks: Blocks of undeveloped land, including those greater than 100 acres.
- iv. Habitat Connections: Modeled habitat areas needed to maintain or restore functional wildlife travel corridors between undeveloped habitat blocks greater than 100-acres and between higher value wetlands.
- v. Riparian Connectors: Modeled crossing locations for wetland dependent species moving between waterways and wetlands divided by roads.
- vi. Conserved Lands: The State of Maine's conserved lands database includes lands in federal, state, and non-profit ownership.

3. Habitat Management Guidelines

- a. **Description:** MDIFW and partners will develop non-regulatory habitat management guidelines for priority habitats and species for distribution to landowners, land managers, towns, land trusts, and others. Several habitat conservation actions (see Element 4) address the need for habitat management guidelines (HMG). We include this topic here in order to monitor develop of HMGs statewide.
- b. **Periodically Assessed Metrics**
 - i. The number of SGCN for which HMGs are developed and published.
 - ii. The number of landowners, land managers, towns, land trusts, and others that receive HMGs.
 - iii. The number of landowners, etc., that implement habitat management according to the guidelines.

4. Land Conservation, Stewardship, and Management

- a. **Description:** Cooperate with state and federal agencies, non-profits, landowners, local land trusts, municipalities, and other partners to conserve habitat for priority species using fee acquisition, conservation easements, purchase of development rights, incentives, cooperative management agreements, management plans, improved comprehensive planning, habitat restoration and enhancements, and other conservation tools. Several habitat conservation actions and themes (see Element 4) address habitat conservation and supporting/expanding landowner incentives. This is an extremely important aspect of Maine's efforts to conserve habitats for SGCN, and we have included this topic here in order to track efforts at a statewide scale.
- b. **Periodically Assessed Metrics:** To monitor the success of these efforts collectively, we will develop a way to periodically monitor the number of acres under habitat conservation through:
 - i. Fee acquisition
 - ii. Conservation easement
 - iii. Purchase of development rights
 - iv. Cooperative management agreements and management plans

PROGRAMMATIC MONITORING

MDIFW and partners developed 11 programmatic actions to help guide Action Plan

implementation over the next ten years (see Element 4, Table 6-11). Three of these actions address monitoring and are described in greater detail below:

- **Program 7:** Annually compile agency and partner expenditures and seek additional match opportunities to maximize efficiency and impact of 2015 Action Plan implementation.
- **Program 8:** Track SWAP conservation action implementation accomplishments by agencies and partners.

With over 500 SGCN and habitat-related conservation actions, successful implementation of Maine's 2015 SWAP will require collaborative efforts among MDIFW and its many conservation partners. Furthermore, State Wildlife Grant funds are limited and, as a state, we need to ensure these dollars are being spent efficiently to achieve desired conservation outcomes. Within the first few years of Plan implementation, MDIFW will work closely with partners to develop tracking systems for conservation expenditures and expenses. MDIFW will develop feedback mechanisms to track partner efforts and accomplishments and use this information to periodically assess the effectiveness of the 2015 SWAP. MDIFW is currently developing a Tracking and Reporting Actions for the Conservation of Species compliant tracking system for agency projects and may develop a similar mechanism for partners. MDIFW also will highlight Action Plan progress and successes at periodic meetings with partners and through media as part of Programmatic Theme 2. To further leverage limited funds, MDIFW also will work with partners to maximize existing and identify new match opportunities, especially for volunteer time that was not previously tracked.

- **Program 9:** Develop SMART (Specific, Measurable, Achievable, Results-oriented, and Time-bound) style objectives for high priority habitat-scale and SGCN conservation actions.

MDIFW and partners developed a comprehensive menu of conservation actions to address Maine's most pressing SGCN and habitat needs. The list is long, despite taking several measures to include only the most important actions (e.g., only developing actions for medium or high level stressors). This is due to several reasons. First, Maine has a wide range of habitats, from subtidal mollusk reefs to high altitude alpine meadows. The stressors affecting these habitats and their SGCN residents are extremely nuanced and often habitat-specific. Furthermore, we are fortunate to have a broad partner base with diverse interests and missions, from habitat conservation and research to advocacy. Rather than present a restricted list applicable to only a subset of partners, we opted to present the full suite of actions so that partners across the state can find a nexus to some aspect of the plan.

We recognize that we cannot implement every action in the plan, even with broad partner support. In order to focus our efforts, we will use the prioritization approach presented in Element 4 to evaluate proposed conservation actions that are not already underway. We may first focus on the 20% of actions ranked as 'critical' for Biological Priority, but we also will consider lower-ranked partner-driven efforts. For actions determined to have sufficient biological impact and feasibility, we will establish SMART objectives to monitor action accomplishments over the next ten years and include this information in tracking programs developed under Programs 7 and 8 above.

ELEMENT 6: PLANS FOR REVISION

States are required to review and revise, as appropriate, Wildlife Action Plans at least every ten years. MDIFW will use the programmatic actions above to monitor conservation action progress at least annually. As described in Elements 7-8, MDIFW will also establish an Implementation Committee in the Fall of 2015 comprised of agency staff and conservation partners. This committee will meet at least annually to review Action Plan accomplishments and to address any emerging issues or adaptive management needs. We will undertake a comprehensive plan review beginning in year eight of the 2015 Action Plan that will include reviewing the criteria and literature used for designating SGCN. We will revisit the stressor levels assigned to SGCN and habitats and determine if our actions sufficiently prevented additional declines or actually improved stressor rankings.

Table 5.1 Status of Population Monitoring for Maine’s Bird Species of Greatest Conservation Need.

Scientific Name	Common Name	Priority	Species-Specific Monitoring	Maine River Bird Survey	Breeding Bird Survey	Christmas Bird count	Mountain Birdwatch	Kennebunk Plains / TNC Annual Survey	Maine Audubon Annual Loon count	Maine Coastal Waterbird Survey	Maine Owl Survey	Maine Colonial Waterbird Survey	Migratory Shorebird Survey (PRISM/ISS)	Waterfowl Brood Counts	Mid-winter Waterfowl Survey	IFW regional shorebird surveys for SWH designation and mapping
<i>Botaurus lentiginosus</i>	American Bittern	3		O												
<i>Fulica americana</i>	American Coot	3		O												
<i>Falco sparverius</i>	American Kestrel	3		O												
<i>Haematopus palliatus</i>	American Oystercatcher	3	N													
<i>Anthus rubescens</i>	American Pipit	2	N				O									
<i>Setophaga ruticilla</i>	American Redstart	2			O											
<i>Picoides dorsalis</i>	American Three-toed Woodpecker	3			O		O									
<i>Scolopax minor</i>	American Woodcock	3														
<i>Sterna paradisaea</i>	Arctic Tern	1		O												

Fratercula arctica	Atlantic Puffin	2														
Icterus galbula	Baltimore Oriole	3		0	0											
Riparia riparia	Bank Swallow	1		0	0											
Tyto alba	Barn Owl	3								0						
Hirundo rustica	Barn Swallow	2		0	0											
Bucephala islandica	Barrow's Goldeneye	1		0												
Setophaga castanea	Bay-breasted Warbler	3			0	0										
Megaceryle alcyon	Belted Kingfisher	3		0	0											
Catharus bicknelli	Bicknell's Thrush	1				0										
Chlidonias niger	Black Tern	2		0												
Mniotilta varia	Black-and-white Warbler	2			0	0										
Picoides arcticus	Black-backed Woodpecker	3			0	0										
Pluvialis squatarola	Black-bellied Plover	3		0								0				N
Coccyzus erythrophthalmus	Black-billed Cuckoo	3			0											
Setophaga fusca	Blackburnian Warbler	3			0											
Nycticorax nycticorax	Black-crowned Night-heron	2		0												
Setophaga striata	Blackpoll Warbler	3			0	0										
Setophaga caerulescens	Black-throated Blue Warbler	3			0											

Setophaga virens	Black-throated Green Warbler	3			0		0									
Vermivora cyanoptera	Blue-winged Warbler	2	N		0			0								
Dolichonyx oryzivorus	Bobolink	3			0			0								
Chroicocephalus philadelphia	Bonaparte's Gull	3		0												
Poecile hudsonicus	Boreal Chickadee	2			0		0									
Buteo platypterus	Broad-winged Hawk	3		0												
Toxostoma rufum	Brown Thrasher	2			0			0								
Cardellina canadensis	Canada Warbler	2			0											
Setophaga tigrina	Cape May Warbler	3			0		0									
Setophaga pensylvanica	Chestnut-sided Warbler	2			0											
Chaetura pelagica	Chimney Swift	2		0	0											
Petrochelidon pyrrhonota	Cliff Swallow	3		0	0											
Gallinula galeata	Common Gallinule	2		0												
Gavia immer	Common Loon	3		0												
Uria aalge	Common Murre	3														
Chordeiles minor	Common Nighthawk	3		0												

<i>Sterna hirundo</i>	Common Tern	2		O											
<i>Calidris alpina</i>	Dunlin	3		O								O			N
<i>Tyrannus tyrannus</i>	Eastern Kingbird	2		O	O										
<i>Sturnella magna</i>	Eastern Meadowlark	2			O			O							
<i>Megascops asio</i>	Eastern Screech-Owl	3									O				
<i>Pipilo erythrophthalmus</i>	Eastern Towhee	2			O			O							
<i>Antrostomus vociferus</i>	Eastern Whip-poor-will	2	O												
<i>Contopus virens</i>	Eastern Wood-Pewee	2			O										
<i>Coccythraustes vespertinus</i>	Evening Grosbeak	2			O										
<i>Spizella pusilla</i>	Field Sparrow	3			O										
<i>Passerella iliaca</i>	Fox Sparrow	3			O										
<i>Aquila chrysaetos</i>	Golden Eagle	2		O											
<i>Ammodramus savannarum</i>	Grasshopper Sparrow	1						O							
<i>Perisoreus canadensis</i>	Gray Jay	3													
<i>Ardea herodias</i>	Great Blue Heron	2		O											
<i>Phalacrocorax carbo</i>	Great Cormorant	1		O											
<i>Puffinus gravis</i>	Great Shearwater	3													
<i>Aythya marila</i>	Greater Scaup	2		O											
<i>Tringa melanoleuca</i>	Greater Yellowlegs	3		O								O			N

Histrionicus histrionicus	Harlequin Duck	1	O	O												
Podiceps auritus	Horned Grebe	3		O												
Eremophila alpestris	Horned Lark	3			O			O								
Leucophaeus atricilla	Laughing Gull	3		O												
Oceanodroma leucorhoa	Leach's Storm-petrel	3														
Ixobrychus exilis	Least Bittern	1		O												
Empidonax minimus	Least Flycatcher	3		O	O											
Calidris minutilla	Least Sandpiper	3		O									O			N
Sternula antillarum	Least Tern	1	O	O												
Tringa flavipes	Lesser Yellowlegs	1	N	O									O			N
Melospiza lincolnii	Lincoln's Sparrow	3			O											
Egretta caerulea	Little Blue Heron	3		O												
Asio otus	Long-eared Owl	3										O				
Clangula hyemalis	Long-tailed Duck	3		O												
Parkesia motacilla	Louisiana Waterthrush	3			O											
Geothlypis philadelphia	Mourning Warbler	3			O											
Ammodramus nelsoni	Nelson's Sparrow	2	O													

Colaptes auratus	Northern Flicker	3			O											
Circus cyaneus	Northern Harrier	3		O												
Setophaga americana	Northern Parula	3			O											
Stelgidopteryx serripennis	Northern Rough-winged Swallow	3		O	O											
Contopus cooperi	Olive-sided Flycatcher	2			O		O									
Icterus spurius	Orchard Oriole	3		O	O											
Falco peregrinus	Peregrine Falcon	1		O												
Podilymbus podiceps	Pied-billed Grebe	3		O												
Pinicola enucleator	Pine Grosbeak	3			O	O										
Charadrius melodus	Piping Plover	1	O	O												
Setophaga discolor	Prairie Warbler	2			O											
Haemorhous purpureus	Purple Finch	3			O		O									
Progne subis	Purple Martin	2	N	O	O											
Calidris maritima	Purple Sandpiper	1	O	O												
Alca torda	Razorbill	2														
Loxia curvirostra	Red Crossbill	3			O		O									
Calidris canutus rufa	Red Knot	1	N	O										O		N

Phalaropus fulicarius	Red Phalarope	3	N	O												
Phalaropus lobatus	Red-necked Phalarope	2	N	O												
Gavia stellata	Red-throated Loon	3		O												
Sterna dougallii	Roseate Tern	1		O												
Pheucticus ludovicianus	Rose-breasted Grosbeak	3			O											
Regulus calendula	Ruby-crowned Kinglet	2			O	O										
Arenaria interpres	Ruddy Turnstone	2		O								O				N
Euphagus carolinus	Rusty Blackbird	1	O													
Ammodramus caudacutus	Saltmarsh Sparrow	1														
Calidris alba	Sanderling	2	O	O								O				N
Piranga olivacea	Scarlet Tanager	3		O	O	O										
Cistothorus platensis	Sedge Wren	1	N													
Calidris pusilla	Semipalmated Sandpiper	2		O								O				N
Limnodromus griseus	Short-billed Dowitcher	3		O								O				N
Asio flammeus	Short-eared Owl	2									O					
Egretta thula	Snowy Egret	3		O												
Tringa solitaria	Solitary Sandpiper	2	N	O												

Porzana carolina	Sora	3		O												
Falciennis canadensis	Spruce Grouse	3														
Catharus ustulatus	Swainson's Thrush	3			O		O									
Oreothlypis peregrina	Tennessee Warbler	2			O											
Tachycineta bicolor	Tree Swallow	2			O	O										
Bartramia longicauda	Upland Sandpiper	1	O	O	O			O								
Catharus fuscescens	Veery	2			O											
Numenius phaeopus	Whimbrel	2	N	O									O			N
Zonotrichia albicollis	White-throated sparrow	3			O		O									
Loxia leucoptera	White-winged Crossbill	3			O	O		O								
Tringa semipalmata	Willet	3	N	O									O			N
Hylocichla mustelina	Wood Thrush	1			O											
Coturnicops noveboracensis	Yellow Rail	2			O											
Setophaga petechia	Yellow Warbler	3			O											
Empidonax flaviventris	Yellow-bellied Flycatcher	3			O	O		O								
Coccyzus americanus	Yellow-billed Cuckoo	2			O											

Table 5.2 Status of Population Monitoring for Maine’s Reptile, Amphibian, and Invertebrate Species of Greatest Conservation Need.

Scientific Name	Common Name	Priority	Species-specific Monitoring	Voluntary Sightings network	Maine Amphibian Monitoring Project (MAMP)	NE Regional Blanding’s and Wood Turtle Survey & Monitoring	Maine Amphibian & Reptile Atlas Project (MARAP)	Maine Butterfly Survey (MBS)	Maine Damselfly & Dragonfly Survey (MDDS)	Maine Mussel Baseline Atlas & Surveys	Maine Bumble Bee Atlas (MBBA)	Maine Tiger Beetle Atlas	Maine Road Herp Hotspot Monitoring Project
Hydroptila blicklei	A Caddisfly	3											
Hydroptila parachelops	A Caddisfly	3											
Hydroptila tomah	A Caddisfly	3											
Ochrotrichia denningi	A Caddisfly	3											
Ameletus browni	A Mayfly	3											
Baetisca berneri	A Mayfly	3											
Baetisca carolina	A Mayfly	3											
Baetisca lacustris	A Mayfly	3											
Baetisca rubescens	A Mayfly	3											
Hexagenia	A Mayfly	3											

rigida													
Metretopus borealis	A Mayfly	3											
Nixe horrida	A Mayfly	3											
Parameletus midas	A Mayfly	3											
Rhithrogena undulata	A Mayfly	3											
Siphonurus barbaroides	A Mayfly	3											
Siphonurus barbarus	A Mayfly	2											
Siphonurus demaryi	A Mayfly	2											
Cucullia speyeri	A Moth	3											
Lepipolys perscripta	A Moth	3											
Nepytia pellucidaria	A Moth	3											
Chaetagnaea cerata	A Noctuid Moth	2											
Alloperla voinae	A Stonefly	3											
Neoperla mainensis	A Stonefly	3											
Xylena thoracica	Acadian Swordgrass Moth	3											
Bombus pensylvanicus	American Bumble Bee	2									0		
Satyrodes appalachia	Appalachian Brown	3						0					
Stylurus	Arrow Clubtail	3							0				

spiniceps													
Cordulegaster obliqua	Arrowhead Spiketail	3	O						O				
Bombus ashtoni	Ashton's Cuckoo Bumble Bee	2									O		
Chaetagnaea tremula	Barrens Chaetagnaea	3											
Speranza exonerata	Barrens Itame	2											
Metarranthis apiciaria	Barrens Metarranthis Moth	2											
Enallagma durum	Big Bluet	3							O				
Stagnicola mighelsi	Bigmouth Pondsnaail	1	O										
Neohelix dentifera	Big-tooth Whitelip	3	N										
Tramea lacerata	Black Saddlebags	3							O				
Emydoidea blandingii	Blanding's Turtle	1	O			O	O						N
Ambystoma laterale	Blue-spotted Salamander	2	O				O						N
Callophrys lanoraieensis	Bog Elfin	3	O					O					
Zale lunifera	Bold-based Zale Moth	3											
Ophiogomphus colubrinus	Boreal Snaketail	1	O						O				
Xylotype capax	Broad Sallow	3											
Neurocordulia	Broad-tailed	3							O				

michaeli	Shadowdragon												
Alasmidonta varicosa	Brook Floater	1	0						0				
Bombus griseocollis	Brown-belted Bumble Bee	3								0			
Leucorrhinia patricia	Canada Whiteface	2	0					0					
Tramea carolina	Carolina Saddlebags	3						0					
Ischnura hastata	Citrine Forktail	3						0					
Lycaena dorcas claytoni	Clayton's Copper	2	0				0						
Cicindela marginipennis	Cobblestone Tiger Beetle	1	0									N	
Gomphus vastus	Cobra Clubtail	3						0					
Hesperia metea	Cobweb Skipper	3	0				0						
Anax longipes	Comet Darner	3	0					0					
Progomphus obscurus	Common Sanddragon	3						0					
Satyrrium titus	Coral Hairstreak	3	0				0						
Plebejus idas empetri	Crowberry Blue	2	0				0						
Argia translata	Dusky Dancer	3						0					
Atrytonopsis hianna	Dusted Skipper	3	0				0						
Erora laeta	Early Hairstreak	2	0				0						
Terrapene carolina	Eastern Box Turtle	2	0				0						N

carolina													
Hemileuca maia maia	Eastern Buckmoth	2											
Thamnophis sauritus	Eastern Ribbon Snake	2	O				O						N
Satyrium edwardsii	Edwards' Hairstreak	2	O					O					
Nannothemis bella	Elfin Skimmer	3							O				
Ophiogomphus anomalus	Extra-striped Snaketail	3							O				
Bombus fernaldae	Fernald's Cuckoo Bumble Bee	3									O		
Boloria frigga saga	Frigga Fritillary	1	O					O					
Nebria nivalis gaspesiana	Gaspé Gazelle Beetle	3	N										
Hemaris gracilis	Graceful Clearwing	3	N										
Callophrys hesseli	Hessel's Hairstreak	1	O					O					
Paonias astylus	Huckleberry Sphinx	3											
Somatochlora incurvata	Incurvate Emerald	3							O				
Bombus insularis	Indiscriminate Cuckoo Bumble Bee	2									O		
Callophrys gryneus	Juniper Hairstreak	2	O					O					
Oeneis polixenes	Katahdin Arctic	1	O					O					

katahdin													
Bombus citrinus	Lemon Cuckoo Bumble Bee	3									0		
Hesperia leonardus	Leonard's Skipper	3					0						
Arigomphus furcifer	Lilypad Clubtail	3						0					
Vertigo malleata	Malleated Vertigo	3	0										
Celithemis martha	Martha's Pennant	3						0					
Lithobates septentrionalis	Mink Frog	3			0		0						N
Danaus plexippus	Monarch	3						0					
Vertigo paradoxa	Mystery Vertigo	2	0										
Libellula needhami	Needhams Skimmer	3							0				
Enallagma laterale	N England Bluet	2	0						0				
Hemileuca lucina	N England Buckmoth	3											
Floridobia winkleyi	N England Silt Snail	3	0										
Coluber constrictor constrictor	Northern Black Racer	1	0				0						N
Plebejus idas	Northern Blue	2						0					
Storeria dekayi dekayi	Northern Brownsnake	2					0						N
Lithobates pipiens	Northern Leopard Frog	2			0		0						N

Gyrinophilus porphyriticus porphyriticus	Northern Spring Salamander	2	O					O						N
Stagnicola oronoensis	Obese Pondsail	3	O											
Zale obliqua	Oblique Zale	3												
Somatochlora minor	Ocellated Emerald	3							O					
Libellula semifasciata	Painted Skimmer	3							O					
Zanclognatha martha	Pine Barrens Zanclognatha	1												
Citheronia sepulcralis	Pine Devil	2												
Lithophane lepida lepida	Pine Pinion	2												
Psectraglaea carnosae	Pink Sallow	2												
Boloria chariclea grandis	Purple Lesser Fritillary	2	O					O						
Ophiogomphus howei	Pygmy Snaketail	2	O						O					
Somatochlora brevicincta	Quebec Emerald	2	O						O					
Ischnura ramburii	Rambur's Forktail	3							O					
Gomphus quadricolor	Rapids Clubtail	2	O						O					
Xystocheilus rufago	Red-winged Sallow	3												
Williamsonia lintneri	Ringed Boghaunter	1	O						O					

Somatochlora albicincta	Ringed Emerald	3							O				
Epeorus frisoni	Roaring Brook Mayfly	1	O										
Bombus affinis	Rusty-patched Bumble Bee	1									O		
Cicindela marginata	Salt Marsh Tiger Beetle	2	O									N	
Bombus sandersoni	Sanderson's Bumble Bee	3									O		
Polygonia satyrus	Satyr Comma	3						O					
Enallagma pictum	Scarlet Bluet	2	O						O				
Erythrodiplax berenice	Seaside Dragonlet	3							O				
Aeshna juncea	Sedge Darner	2							O				
Papilio brevicauda gaspeensis	Short-tailed Swallowtail	3	O					O					
Catocala similis	Similar Underwing	3											
Vertigo morsei	Six-whorl Vertigo	1	O										
Erynnis brizo	Sleepy Duskywing	2	O					O					
Thorybes bathyllus	Southern Cloudywing	3						O					
Lapara coniferarum	Southern Pine Sphinx	3											
Lanthus vernalis	Southern Pygmy Clubtail	2							O				
Spartiniphaga	Spartina Borer	3											

inops	Moth												
Rhionaeschna mutata	Spatterdock Darner	3	O						O				
Papilio troilus	Spicebush Swallowtail	3	O					O					
Appalachina sayana	Spike-lip Crater	3	N										
Pteronarcys comstocki	Spiny Salmonfly	3											
Epiaeschna heros	Swamp Darner	3	N						O				
Leptodea ochracea	Tidewater Mucket	1	O							O			
Siphonisca aerodromia	Tomah Mayfly	1	O										
Enallagma carunculatum	Tule Bluet	3							O				
Lycia rachelae	Twilight Moth	2											
Cupido amyntula maritima	Western Tailed Blue	3						O					
Cicindela ancocisconensis	White Mountain Tiger Beetle	2	O									N	
Glyptemys insculpta	Wood Turtle	1	O			O	O						N
Bombus fervidus	Yellow Bumble Bee	3									O		
Lampsilis cariosa	Yellow Lampmussel	1	O							O			
Bombus terricola	Yellowbanded Bumble Bee	3									O		
Aeshna	Zigzag Darner	3							O				

sitchensis													
Alasmidonta undulata	Triangle Floater	3	O							O			
Anodonta implicata	Alewife Floater	3	O							O			
Margaritifera margaritifera	Eastern Pearlshell	3	O							O			
Clemmys guttata	Spotted Turtle	1	O				O						N
Orconectes limosus	Spinycreek Crayfish	3	N										

Table 5.3 Status of Population Monitoring for Maine's Inland Fish Species of Greatest Conservation Need.

Scientific Name	Common Name	Priority	Species-specific Monitoring	Clerk Creel Census	Voluntary Creel Census	Baitfish Dealer Inspections	Stream Electro Fishing	Lake Electro Fishing	Gill Netting	Trap Netting	Telemetry/Marking	eDNA	Beach Seines	Minnow Traps/Pots	Fishway Traps	Trawling	SCUBA / Snorkeling	Experimental Angling	Monitoring Salmon Traps & Lifts	Spawning Stock Surveys
Lethenteron appendix	American Brook Lamprey	3	N				O				N	N								
Salvelinus alpinus oquassa	Arctic Charr	1	O	O	O				O	O	O	N					O	O		O
Notropis heterolepis	Blacknose Shiner	3	N			O	O	O			N	N	O	O	N					
Notropis bifrenatus	Bridle Shiner	2	N			O	O	O			N	N	O	O	N					
Culaea inconstans	Brook Stickleback	3	N				O				N	N	N	O	N					
Salvelinus fontinalis	Brook Trout	3	O	O	O		O	O	O	O	O	N			O		O	O	O	O
Lota lota	Burbot	3	N	O	O		O	N	N	N	N	N			N			N		
Erimyzon oblongus	Creek Chubsucker	3	N			O	O	N	N	O	N	N	O	O	N					
Hybognathus	Eastern	3	N			O	O	O					O	O	N					

regius	Silvery Minnow																			
Salvelinus namaycush	Lake Trout	3	O	O	O			O	O	O						N	O	O		O
Coregonus clupeaformis	Lake Whitefish	2	O	O	O		N	N	O	O					N	N	N	O		O
Rhinichthys cataractae	Longnose Dace	3	N			O	O	O					O	O	N					
Catostomus catostomus	Longnose Sucker	3	N			O	N	O	O	O					O					
Margariscus margarita	Pearl Dace	3	N			O	O	O					O	O	N					
Esox americanus americanus	Redfin Pickerel	2	O	O			O	N		N			N							
Prosopium cylindraceum	Round Whitefish	2	O	O	O		N	N	O	O					N	N	N	N		N
Etheostoma fusiforme	Swamp Darter	2	N				O						O				N			

Table 5.4 Status of Population Monitoring for Maine's Mammal Species of Greatest Conservation Need.

Scientific Name	Common Name	Priority	Species-specific Monitoring	Voluntary Sightings network	North American Bat Survey	N England Cottontail Range-Wide Conservation Strategy Monitoring
<i>Alces alces americanus</i>	Moose	3	O			
<i>Eptesicus fuscus</i>	Big Brown Bat	2			N	
<i>Lasionycteris noctivagans</i>	Silver-haired Bat	2			N	
<i>Lasiurus borealis</i>	Eastern Red Bat	3			N	
<i>Lasiurus cinereus</i>	Hoary Bat	3			N	
<i>Lynx canadensis</i>	Canada Lynx	2	O	O		
<i>Microtus pennsylvanicus shattucki</i>	Penobscot Meadow Vole	2				
<i>Myotis leibii</i>	Eastern Small-footed Myotis	1			N	
<i>Myotis lucifugus</i>	Little Brown Bat	1			N	
<i>Myotis septentrionalis</i>	Northern Long-eared Myotis	1			N	
<i>Ondatra zibethicus</i>	Muskrat	3	O			
<i>Perimyotis subflavus</i>	Tri-colored Bat	2			N	
<i>Sorex dispar</i>	Long-tailed Shrew	3				
<i>Sylvilagus transitionalis</i>	N England Cottontail	1	O	O		N
<i>Synaptomys borealis sphagnicola</i>	Northern Bog Lemming	1	O			

Table 5.5 Status of Population Monitoring for Maine’s Marine Species of Greatest Conservation Need.

Scientific Name	Common Name	Priority	Species-specific Monitoring	Clerk Creel Census	Voluntary Creel Census	Mandatory Reporting	Stream Electro Fishing	Lake Electro Fishing	Gill Netting	Trap Netting	Beach Seines	Fishway Traps	DMR trawl survey	SCUBA / Snorkeling	Experimental Angling	Voluntary Sightings network	Monitoring Salmon Traps & Lifts	Spawning Stock Surveys	Habitat Mapping	Species Interaction Studies	Environmental/Habitat Change Effect Studies	
<i>Calanus finmarchicus</i>	A Copepod	3	N																	N	N	
<i>Alosa pseudoharengus</i>	Alewife	2	O			O	O			O	O	O	O					O	O		N	N
<i>Anguilla rostrata</i>	American Eel	2	O			O	O			O	O	O	O					O	O			N
<i>Arrhoges occidentalis</i>	American Pelican Foot	2	O											O						N		N
<i>Ammodytes americanus</i>	American Sand Lance	3											O									
<i>Alosa sapidissima</i>	American Shad	1	O	O	O				O	O	O	O	O					O	O			
<i>Thunnus thynnus</i>	Atlantic Bluefin Tuna	2		O	O	O												O				
<i>Gadus morhua</i>	Atlantic Cod	1	O	O	O	O							O					O				
<i>Zirfaea crispata</i>	Atlantic Great Piddock	2	O											O						N		N
<i>Salmo salar</i>	Atlantic Salmon	1	O									O		O			O	O	O		N	O
<i>Placopecten magellanicus</i>	Atlantic Sea Scallop	3	O			O							O	O					O		N	N

Acipenser oxyrinchus	Atlantic Sturgeon	1	O							O							O	O			
Anarhichas lupus	Atlantic Wolffish	2															O	N			
Dipturus laevis	Barndoor Skate	2	O																		
Mytilus edulis	Blue Mussel	3	O			O												O	N	N	
Prionace glauca	Blue Shark	3	O	O																	
Balaenoptera musculus	Blue Whale	2														O					
Alosa aestivalis	Blueback Herring	1	O			O	O			O	O	O	O					O	O	N	
Boreotrophon clathratus	Clathrate Trophon	2	O										O						N		N
Colus pygmaeus	Colus Snail	2	O										O						N		N
Asterias rubens	Common Sea Star	2	O										O	O					N		N
Crossaster papposus	Common Sun Star	2	O										O	O					N		N
Alopias vulpinus	Common Thresher Shark	3	O	O																	
Alcyonium digitatum	Dead Man's Fingers	3	N																N	N	N
Crassostrea virginica	Eastern oyster	3	O			O													O	N	N
Margaritifera margaritifera	Eastern Pearlshell	3	O											O					N		N
Balaenoptera physalus	Finback Whale	2	O													O					
Asterias forbesi	Forbes's Starfish	2	O											O					N		N
Mya truncata	Gaper Clam	3	O											O					N	N	N
Strongylocentrotus droebachiensis	Green Sea Urchin	2	O			O								O	O				O	N	N
Chelonia mydas	Green Seaturtle	2															O				

Melanogrammus aeglefinus	Haddock	1		0	0	0										0	N		
Phocoena phocoena	Harbor Porpoise	2	0										0				0		
Mercenaria mercenaria	Hard-shelled Clam	3	0			0							0				0	N	N
Limulus polyphemus	Horseshoe Crab	1	0														0		N
Megaptera novaeangliae	Humpback Whale	1	0										0				0		
Chlamys islandica	Icelandic Scallop	3	0									0	0				N	N	N
Lepidochelys kempii	Kemp's Ridley Seaturtle	2															0		
Terebratulina septentrionalis	Lamp Shell	2	0										0					N	N
Dermochelys coriacea	Leatherback Seaturtle	1															0		
Limacina helicina	Limacina Snail	3	0										0					N	N
Caretta caretta	Loggerhead Seaturtle	2															0		
Boreotrophon truncatus	Murex	2	0										0					N	N
Eubalaena glacialis	North Atlantic Right Whale	1	0														0		
Gorgonocephalus arcticus	Northern Basket Starfish	2	0										0	0				N	N
Pandalus borealis	Northern Shrimp	1	0			0							0					0	0
Cucumaria frondosa	Orange-footed Sea Cucumber	2	0			0							0						
Lebbeus polaris	Polar Lebbeid Shrimp	2	0										0	0				N	N

Lamna nasus	Porbeagle	2	O	O																
Psolus fabricii	Psolus	2	O									O						N	N	
Psolus phantapus	Psolus	2	O									O						N	N	
Solaster endeca	Purple Sunstar	2	O									O	O					N	N	
Osmerus mordax	Rainbow Smelt	1	O	O	O	O			O	O		O					O	O	N	N
Thyonidium drummondii	Sea Cucumber	2	O									O								
Gersemia rubiformis	Sea Strawberry	2	O									O						N	N	
Balaenoptera borealis	Sei Whale	2	O												O			O		
Isurus oxyrinchus	Shortfin Mako	2	O	O																
Acipenser brevirostrum	Shortnose sturgeon	1	O					O		O							O	O		
Sphyrna zygaena	Smooth Hammerhead	3	O	O																
Malacoraja senta	Smooth Skate	2	O									O								
Mya arenaria	Softshell Clam	3	O			O												O	N	N
Physeter macrocephalus	Sperm Whale	2	O												O					
Ptychotractus ligatus	Spindle Shell	2	O										O					N	N	
Lebbeus groenlandicus	Spiny Lebbeid Shrimp	2	O									O	O					N	N	
Anarhichas minor	Spotted Wolffish	3	N																	
Morone saxatilis	Striped Bass	2	O	O	O					O		O					O	O		
Amblyraja radiata	Thorny Skate	2	O									O								
Limneria undata	Wavy Lamellaria	3	O									O						N	N	

Stephanasterias albula	White Sea Star	2	0										0					N		N
Pseudopleuronectes americanus	Winter Flounder	2	0			0							0				0	0		0
Leucoraja ocellata	Winter Skate	2	0										0							

KEY TO ACRONYMS

BwH	Beginning with Habitat
GIS	Geographic Information System
HMG	Habitat Management Guidelines
NMFS	National Marine Fisheries Service
MDIFW	Maine Dept. of Inland Fisheries and Wildlife
MDMR	Maine Dept. of Marine Resources
SGCN	Species of Greatest Conservation Need
SMART	Specific, Measurable, Achievable, Results-oriented, and Time-bound
SWG	State Wildlife Grants
TRACS	Tracking and Reporting Actions for the Conservation of Species

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Table 5.5	Status of Population Monitoring for Maine's Marine Species of Greatest Conservation Need
Table 5.6	Proposed Habitat Monitoring Approaches

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Appendix 1. Minutes of Steering Committee Meetings

Appendix 2. Operational Carter

Appendix 3. Agendas – Conservation Partner Meetings

Element 7 - Coordination with Partners

Element 8 - Public Participation

Abstract: Maine has a long history of successful collaboration among conservation partners -- conducting comprehensive wildlife planning and public involvement for nearly forty years. The Maine Dept. of Inland Fisheries and Wildlife (MDIFW) began assembling a SWAP coordination team in January 2014. This planning team developed the strategies necessary to achieve the eight required elements of the 2015 SWAP. In September 2014, the Coordination Team established a SWAP Steering Committee to guide the overall development of the SWAP. The Steering Committee represented the broader partner group by providing regular and timely input into the activities and proposed strategies of the Coordination Team. The Coordination Team and the Steering Committee began preparing Maine's charter early in the update; the Steering Committee officially adopted the charter in November 2014. The Coordination Team invited 158 conservation partners to participate in the preparation of Maine's 2015 SWAP, representing 102 unique organizations and the public from July 2014 – June 2015 the partners attended five, seven-hour "conservation partner" meetings at which they collaborated in the development of elements 1-5 of the 2015 SWAP.

MDIFW sought to both inform the public of its intent to revise the Action Plan and to encourage public participation. It established a Public Outreach Subcommittee to guide its public participation efforts. The subcommittee identified effective methods for engaging and soliciting input from the public, and the Coordination Team and Steering Committee scaled these methods to make effective use of agency resources and ensure an appropriate level of public participation.

The success of Maine's 2015 Wildlife Action Plan depends on continued partner and public engagement during plan implementation. To help guide implementation of these actions and to encourage continued public involvement, MDIFW and its partners developed six outreach Programmatic Theme that relate to 1. Outreach and Engagement and 2. Program Funding and Tracking.

Differences from Maine's 2005 Comprehensive Wildlife Conservation Strategy are discussed.

Introduction

Element 7 requires the Maine Dept. of Inland Fisheries and Wildlife (MDIFW) to coordinate, to the extent feasible, with federal, state, and local agencies and Indian tribes that manage significant areas of land or water within the state, or administer programs that significantly affect the conservation of species of greatest conservation need (SGCN) during development, implementation, review, and revision of Maine's State Wildlife Action Plan (SWAP). Element 8 requires MDIFW to provide an opportunity for public participation in the development of the Wildlife Action Plan (AFWA 2012)

Developing the partnerships identified in elements 7 and 8 early in the SWAP revision, and revisiting them as often as necessary, will promote partner ownership and support, maintain positive and collaborative relationships, and ensure that the Plan is a plan for Maine, not just for MDIFW and the Maine Dept. of Marine Resources (MDMR). SWAPs must reflect the values of conservation partners (federal, state, and local agencies, Indian tribes, and the public) to be successful. This requires collaboration across jurisdictions and organizations that builds public and political support for the SWAP. Support is achieved when the Plan's revision and implementation is transparent and open to public input. To be achieved, the goals of the SWAP must be accomplished through coordinated actions undertaken in partnership. Complementary roles and actions with partners will elevate conservation actions to broader levels, leverage scarce resources, and avoid duplication of effort.

Maine has a long history of successful collaboration among conservation partners -- conducting comprehensive wildlife planning and public involvement for nearly forty years. Most notable is MDIFW's species planning process (Chapters 6, 7, MDIFW 2005). MDIFW invoked this same history in developing Maine's 2005 SWAP (MDIFW 2005), and amplified this collaboration during the 2015 revision (Table 1).

ACTION PLAN COORDINATION TEAM / ACTION PLAN STEERING COMMITTEE

SWAP Coordination Team

MDIFW began assembling a SWAP coordination team in January 2014. This planning team developed the strategies necessary to achieve the eight required elements of the 2015 SWAP. It met bi-weekly for several hours. As the planning responsibilities of the team broadened, it reached out to include additional individuals. Maine's SWAP Coordination Team was:

Judy Camuso, Director, Wildlife Division, MDIFW
Andy Cutko, Ecologist, Maine Natural Areas Program
Phillip deMaynadier, Reptile, Amphibian, and Invertebrate Group Leader, MDIFW
Clair Enterline, Fishery Biologist, Maine Dept. of Marine Resources
Amanda Shearin, Wildlife Planner, MDIFW
Mark Stadler, Wildlife Action Plan Coordinator, MDIFW (retired)
Charlie Todd, Endangered and Threatened Species Coordinator, MDIFW
Nate Webb, Special Projects Biologist, MDIFW

One of the team's initial actions was the identification of conservation partners who would be invited to participate in developing the SWAP (Table 2).

SWAP Steering Committee

In September 2014, the Coordination Team established a SWAP Steering Committee to guide the overall development of the SWAP. The Steering Committee represented the broader partner group by providing regular and timely input into the activities and proposed strategies of the Coordination Team. Because the Coordination Team was concerned largely with the week-

to-week aspects of SWAP preparation, the team asked the Steering Committee to monitor its success in accomplishing the larger, overall aspects of the SWAP (AFWA 2012). The committee reviewed the Coordination Team's strategies for developing the Action Plan prior to implementation with the conservation partners. The committee's guidance provided quality-control as development of the SWAP progressed.

The committee assisted the Coordination Team with planning conservation partner meetings (five, day-long meetings occurring from July 2014 – June 2015), providing suggestions on the meeting agenda, meeting format, and the manner in which MDIFW, MDMR, and the Maine Natural Areas Program (MNAP) might present information to the partners.

The Nature Conservancy, a member of the committee, provided Open Standards (CMP 2013) training for MDIFW, MDMR, MNAP, and several conservation partners prior to developing SGCN habitat conservation actions. Following the training, MDIFW, MDMR, MNAP, and several conservation partners met for two, day-long sessions to develop preliminary SGCN habitat conservation actions for 1) Terrestrial / Wetland and 2) Coastal / Marine / Freshwater habitats.

The Steering Committee met monthly, generally for four or five hours (Tables 3-6). MDIFW recorded the minutes of each meeting (Appendix 1). The committee consisted of representatives from:

Brunswick-Topsham Land Trust / Angela Twitchell
 Maine Audubon Society / Sally Stockwell
 Maine Coastal Program / Emily Norton
 Maine Dept. of Inland Fisheries and Wildlife / Judy Camuso, Amanda Shearin, Nate Webb, Charlie Todd, Phillip deMaynadier, Mark Stadler
 Maine Dept. of Marine Resources / Claire Enterline
 U.S. Fish and Wildlife Service / Jed Wright
 Maine Coast Heritage Trust / Tim Glidden
 Maine Forest Products Council / Barry Burgason
 Maine Natural Areas Program / Molly Docherty, Andy Cutko
 Natural Resources Conservation Service / Jeff Norment
 Small Woodland Owners Association of Maine / Tom Doak
 The Nature Conservancy / Barbara Vickery

SWAP Review and Update Charter

The Best Practices for State Wildlife Actions Plans (AFWA 2012) recommends that each state prepare a charter to formalize how conservation partners and fish and wildlife agencies will work together to develop the SWAP. The Coordination Team and the Steering Committee began preparing Maine's charter early in the update; the Steering Committee officially adopted the charter in November 2014. The charter outlines the organizational structure that MDIFW, MDMR, and partners established to accomplish the Action Plan update, as well as the process they used, and the schedule for completion of specific tasks. The charter explicitly defines and delineates key roles, responsibilities, and contributions for MDIFW, MDMR, and partners. Maine's charter is structured around six considerations. The entire document is found in Appendix 2.

1. Introduction
2. Statement of Purpose: Maine's Wildlife Action Plan

- 3. Guiding Principles
- 4. Operational Guidance for Conservation Partners, Including the Steering Committee and Subcommittees
- 5. Process Structure
 - 5.1. Conservation partners
 - 5.2. Steering Committee
 - 5.3. Subcommittees
- 6. Evaluation

COORDINATION WITH CONSERVATION PARTNERS

The Coordination Team invited 158 conservation partners to participate in the preparation of Maine's 2015 SWAP, representing 102 unique organizations and the public (Table 2).

Federal partners	14
State partners	14
Local partners	2
Tribal partners	5
Public partners	66 (includes non-governmental conservation organizations)

Table 1. Comparison of Conservation Partner Engagement 2005 and 2015

Metric	2005	2015
Approximate number of conservation partners	64	158
Approximate number of unique organizations	51	102
Number of partner meetings	3, 6-hour meetings	5, 7+ hour partner meetings, steering committee and subcommittee meetings, workshops, and others described below

From July 2014 – June 2015 the partners attended five, seven-hour “conservation partner” meetings at which they collaborated in the development of elements 1-5 of the 2015 SWAP (Tables 3-6, Appendix 3).

Coordination with Federal Partners

The Coordination Team invited 14 federal conservation partners to participate in the preparation of the 2015 SWAP (Table 2). Federal partners served on the SWAP Steering Committee, attended the five conservation partner meetings, and participated in several workshops and training sessions (Table 3). Federal partners from Region 5, USFWS provided an essential link with the tribal partners.

Coordination with State Partners

Fourteen state agency partners participated in developing the 2015 SWAP (Table 2). State partners served on the SWAP Steering Committee, attended the five conservation partner meetings, and participated in several workshops and training sessions (Table 4).

Coordination with Local Partners

MDIFW presented information about the SWAP and its ongoing update to the Brunswick Conservation Commission and also at the annual meeting of the Maine Association of Conservation Commissions (Tables 2 and 5). MDIFW invited both organizations to become involved in the SWAP update and to provide their thoughts and comments.

Coordination with Tribal Partners

The Coordination Team and Steering Committee invited five tribal conservation partners to participate in the SWAP (Table 2). Tribal partners attended one of the five conservation partner meetings (Table 5). In March 2015, Maine tribes met with staff from the USFWS and members of the SWAP Steering Committee. The day-long meeting addressed opportunities for collaboration between federal, state, and tribal partners in the development and funding of conservation programs for SGCN. The tribes requested that species of tribal cultural significance be included on Maine's list of SGCN species; and Maine revised its SGCN list to include these species.

Coordination with Public Partners, Including Non-governmental Conservation Organizations

Sixty-six public conservation partners, including non-governmental conservation organizations and academia, assisted with the preparation of 2015 SWAP (Table 2). Public partners participated in all aspects of SWAP development (Tables 6.1, 6.2, 6.3).

PUBLIC ENGAGEMENT

MDIFW sought to both inform the public of its intent to revise the Action Plan and to encourage public participation. It established a Public Outreach Subcommittee to guide its public participation efforts. The subcommittee identified effective methods for engaging and soliciting input from the public, and the Coordination Team and Steering Committee scaled these methods to make effective use of agency resources and ensure an appropriate level of public participation. Table 7 presents a summary of outreach efforts achieved via press releases, newsletter articles, and social media.

Table 7. Press Releases, Articles, and Social Media

MDIFW Press Release	November 19, 2014
MDIFW Facebook post (181 likes, 26 shares)	November 19, 2014
MDIFW Twitter	November 24, 2014
SeaCoast Online Article	November 30, 2014
Maine Association of Wetland Scientists Newsletter	February 2015
MDIFW prepared a stock newsletter article available to all partners	February 2015
Action Plan update brochure	March 2015
Press release when plan is posted for public review	July 2015
Social media posts when plan is posted for public review	July 2015

Public Presentations

During each Action Plan presentation or workshop, MDIFW asks the audience for input on ways to present plan information and what types of 'services' (e.g., web portals, technical assistance) they would find most useful for incorporating the plan into their own work. All suggestions are recorded and will be considered during plan implementation. During one such meeting, audience members suggested we hold regional workshops hosted by conservation commissions. We have contacted the Maine Association of Conservation Commissions to help with this effort.

Brochure

MDIFW developed a SWAP brochure (March 2015) that is available to agency staff for distribute at the non-SWAP meetings or presenting they attend. MDIFW also has made the brochure available to partners for distribution within their respective organizations.

Peer Review

MDIFW and MDMR asked 47 non-agency taxa specialists to provide peer review of the criteria used to identify SGCN and the draft SGCN lists generated (June 2014). They received several hundred species-specific responses. In addition, MDIFW and MDMR asked these specialists to review SGCN habitats and SGCN habitat stressors (January 2015) and received comments from three.

Maine SWAP Webpage

MDIFW established a SWAP webpage, within the agency website, dedicated to the 2015 Action Plan revision (June 2014). <http://www.maine.gov/ifw/wildlife/reports/MWAP2015.html>
The page allows the public and partners to view Action Plan documents, meeting schedules, Steering Committee and subcommittee meeting minutes, and contact information, as well as the 2005 Wildlife Action Plan. MDIFW updates the page regularly.

Email Correspondence

MDIFW created a dedicated Google email account (July 2014) posted this address on the Action Plan webpage, in press releases, and correspondence with partners. To date the public has sent five inquires to the mailbox. (This is expected to increase during the 30-day public comment period). In addition, MDIFW and MDMR have engaged in numerous email exchanges with partners and the public via staff individual maine.gov email accounts.

30-day Public Comment Period

In July, MDIFW will post the first draft of the 2015 Wildlife Action Plan on the plan's webpage and provide the public with an opportunity to review and comment on the draft.

Upcoming / Proposed Public Engagement Efforts

Regional public presentations (TBD, Audubon chapters?)

Additional presentations as opportunities arise

PUBLIC AND PARTNER ENGAGEMENT DURING PLAN IMPLEMENTATION

The success of Maine's 2015 Wildlife Action Plan depends on continued partner and public engagement during plan implementation. MDIFW and its partners identified approximately 120 outreach and education conservation actions addressing SGCN and SGCN habitats (see Element 4). To help guide implementation of these actions and to encourage continued public

involvement in the plan in general, MDIFW and its partners developed six outreach-related overarching Programmatic Actions (see Element 4). Three of these themes address plan-wide outreach and education strategies, and three themes address strategies for tracking and funding partner conservation efforts. Themes are described in greater detail below; proposed commencement timelines (short-term: early in plan implantation; mid-term: midway through plan implementation; long-term: toward the end of plan implantation) are given for each.

Outreach and Engagement Programmatic Themes

Programmatic Theme 1: Establish an Action Plan implementation committee comprised of conservation partners and agency staff to help guide implementation of the 2015 Action Plan (short-term)

As described in the beginning of this chapter, MDIFW coordinated closely with the SWAP Steering Committee during plan development. During Fall 2015, MDIFW will begin to transition this committee into a SWAP Implementation Committee comprised of interested Steering Committee members and other key partners that will work with agency staff to help guide implementation of the 2015 Action Plan and address emerging issues. The Implementation Committee will meet at least annually with additional updates provided through email and phone conferences. Within the first year of Plan implementation, MDIFW will work with the Implementation Committee to develop a charter and set goals and objectives for the group. MDIFW also will work with the Implementation Committee to establish several subcommittees (comprised of agency staff, Implementation Committee members, and other interested partners) to address specific implementation or technical needs, such as Programmatic Themes 2 and 5.

Programmatic Theme 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 (mid-term)

MDIFW will work with the Implementation Committee and a to-be-established Outreach Subcommittee to develop and implement strategies that: 1) make the 2015 SWAP available to all users in accessible formats, and, 2) foster partner and public engagement in the Plan. First, the committees will explore multiple approaches (suggested by partners during plan development) for accessing plan information including online links to SGCN ecology and conservation information, SGCN habitat management recommendations, SGCN distribution data, and information modules targeted to different user groups (e.g., private landowners, land trusts, municipalities) and regions (e.g., individual ecoregions or watersheds). MDIFW also is exploring options for making the 2015 SWAP database accessible to the public. This relational database contains linked and searchable information for each SGCN including the criteria that qualified each species as SGCN, habitat and distribution information, threats to each SGCN and associated habitats, conservation actions at both species-specific and habitat scales, and species-specific notes to aid in conservation efforts. MDIFW will work with the Implementation Committee and Outreach Subcommittee to help guide development of these online and database tools as well as other formats for accessing plan information. In addition, MDIFW will continue to update the 2015 Wildlife Action Plan website and provide contact information.

To address the second task, MDIFW will work with the Implementation Committee and Outreach Subcommittee to generate outreach materials (e.g., newsletters, blog posts, social media posts) and coordinate periodic events (e.g., annual meetings, trainings) to update

partners on plan accomplishments and opportunities for involvement. MDIFW also plans to host periodic workshops with partner user groups on accessing plan information. Furthermore, MDIFW may establish a small grants program for partners implementing conservation actions (Programmatic Action 5). If implemented, this program likely will generate ongoing partner interest in the Action Plan through periodic requests for proposals (RFP) and award announcements.

Programmatic Theme 3: Develop a public survey of SWAP and non-game species awareness, concerns, and priorities (initial survey: short-term; second survey: long-term [tentative])

In a recent survey, 95% of Mainers valued protection of wildlife for the enjoyment of people but were largely unaware of how MDIFW is funded to accomplish this task (LD 225 Report 2010). Additional surveys also highlight the importance of Maine's wildlife resources to land use decisions (Butler et al. 2013) and to the state's economy (Southwick Associates 2013). However, there is little information on Maine citizens' awareness of SWAP and non-game species conservation. Public opinion surveys conducted in other states (e.g., Pennsylvania [Responsive Management 2014]) have shown increasing public concern for and awareness of non-game species. MDIFW will soon undertake a large-scale public survey effort to determine attitudes toward game and non-game species conservation, management, and funding. Survey results will help guide Departmental priorities and outreach approaches. This survey also provides a timely opportunity to highlight Maine's 2015 Action Plan and discuss options for establishing stable funding for wildlife conservation. MDIFW may also conduct a second survey toward the end of Action Plan implementation to gauge the effectiveness of public outreach and education efforts developed as part of Programmatic Theme 2.

Funding and Tracking Programmatic Themes

Programmatic Theme 5: Consider establishing a competitive small grants program to make a portion of State Wildlife Grant (SWG) funds available to partners implementing priority actions identified in the 2015 Action Plan (mid-term)

MDIFW will consider establishing a competitive small grants program to make a small portion of SWG funds available to partners. This program has two major benefits: 1) awarded funds will help leverage partners' existing or new SGCN conservation efforts; and, 2) it encourages ongoing partner involvement in the Action Plan and communication with MDIFW through periodic RFPs and reporting requirements. A small grants program also addresses conservation partner requests for greater access to and transparency on the use of SWG funds.

To establish a small grants program, MDIFW must first address several logistical and grant administration needs. Because SWG funds are limited, MDIFW will work with partners to identify the minimum award amount necessary to leverage matching funds or seed money for SGCN conservation projects. If this amount is feasible and does not compromise ongoing SWG-funded projects and personnel, MDIFW work with the Implementation Committee to develop a transparent grant advertising, selection, and reporting process.

Programmatic Theme 7: Annually compile agency and partner expenditures and seek additional match opportunities to maximize efficiency and impact of 2015 Action Plan implementation (short-term)

SWG funds are limited; therefore, MDIFW will work closely with partners to track and annually compile expenditures to ensure funds are being spent efficiently and achieving the desired conservation outcomes. To further leverage limited funds, MDIFW also will work with partners to maximize existing and identify new match opportunities. This theme will be discussed further in Elements 5 and 6.

Programmatic Theme 8: Track SWAP conservation action implementation accomplishments by agencies and partners (short-term)

With over 500 SGCN and habitat-related conservation actions, successful implementation of Maine's 2015 SWAP will require collaborative efforts among MDIFW and its many conservation partners. MDIFW will develop feedback mechanisms to track partner efforts and accomplishments and use this information to periodically assess the effectiveness of the 2015 SWAP. MDIFW is currently developing a TRACS-compliant tracking system for agency projects and may develop a similar mechanism for partners. MDIFW also will highlight Action Plan progress and successes at periodic meetings with partners and through media as part of Programmatic Theme 2. Programmatic Theme 8 will be described in greater detail in Elements 5 and 6.

List of Acronyms

MDIFW	Maine Dept. of Inland Fisheries and Wildlife
MDMR	Maine Dept. of Marine Resources
RFP	Request for Proposals
SGCN	species of greatest conservation need
SWAP	State Wildlife Action Plan
SWG	State Wildlife Grants
TRACS	Tracking and Reporting Actions for the Conservation of Species

List of Tables

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Table 4. Extent of Coordination with State Partners during the Development of Maine's 2015 Wildlife Action Plan

Table 5. Extent of Coordination with the Tribal and Local Partners during the Development of Maine's 2015 Wildlife Action Plan

Table 6. Extent of Coordination with the Public Partners during the Development of Maine's 2015 Wildlife Action Plan

Table 7. Press Releases, Articles, and Social Media

Literature Cited

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Appendices

- Appendix 1: Minutes of Steering Committee Meetings
- Appendix 2: Operational Charter
- Appendix 3: Agendas -- Conservation Partner Meetings

Table 2. Conservation Partners Invited to Participate in the Preparation of Maine's 2015 WAP	
Federal	
Acadia Nat'l Park Maine Army National Guard National Marine Fisheries Service [Maine Field Station] Natural Resource Conservation Service National Oceanic and Atmospheric Administration US Fish and Wildlife Service, Ecological Services USFWS Gulf of Maine Coastal Program USFWS Maine Fishery Resource Office USFWS North Atlantic Landscape Conservation Cooperative USFWS Maine Wildlife Action Plan Contact USFWS Aroostook, National Wildlife Refuge System USFWS Maine Coastal Islands NWR USFWS Moosehorn NWR USFWS Rachel Carson NWR	
State	
Baxter State Park DACF(1) Bureau of Agriculture, Resource Development Division DACF Bureau of Agriculture, Food and Rural Resources DACF Land Use Planning Commission DACF Lands for Maine's Future Program DACF Maine Coastal Program DACF Maine Forest Service DACF Maine Natural Areas Program DACF Municipal Planning Assistance Program DAFC Bureau of Parks and Lands Dept of Environmental Protection Dept. of Marine Resources Dept. of Inland Fisheries and Wildlife Dept. of Transportation, Environmental Office (1) Dept. of Agricultural, Conservation, and Forestry	
Local	
Maine Association of Conservation Commissions Maine Association of Planners	
Tribes	
Aroostook Band of MicMac Indians Houlton Band of Maliseet Indians Passamaquoddy Tribe Indian township Reservation Passamaquoddy Tribe Pleasant Point Reservation Penobscot Nation	

Table 2. Conservation Partners Invited to Participate in the Preparation of Maine's 2015 WAP

Public
Appalachian Conservation Biology
Atlantic Salmon Federation
Biodiversity Research Institute
Brunswick Topsham Land Trust
Casco Bay Estuary Partnership
Coastal Mountains Land Trust
Conservation Law Foundation - Maine Advocacy Center
Cornell University
Defenders of Wildlife
Downeast Lakes Land Trust
Downeast Salmon Federation
Ducks Unlimited
Endangered Species Coalition
Forest Society of Maine
GrowSmart Maine
Gulf of Maine Research Institute
Island Institute
Lakes Environmental Association
Maine Aquaculture Association
Maine Association of Wetland Scientists
Maine Audubon Society
Maine Birding Trail
Maine Bowhunters Association
Maine Chamber of Commerce
Maine Chapter of the Sierra Club
Maine Chapter of the Wildlife Society
Maine Coast Heritage Trust
Maine Cooperative Fish & Wildlife Research Unit
Maine Discovery Museum
Maine Farm Bureau
Maine Farmland Trust
Maine Forest Products Council
Maine Lakes Society
Maine Maritime Academy
Maine Professional Guides Association
Maine Rivers
Maine SeaGrant
Maine Tourism Association
Maine Trappers Association

Table 2. Conservation Partners Invited to Participate in the Preparation of Maine's 2015 WAP

Maine's TWW / SWG Coalition
Manomet Center for Conservation Science
MDIFW Advisory Council
Mt. Agamenticus to the Sea
National Wild Turkey Federation
Natural Resources Council of Maine
North Maine Woods
Northern Maine Partner
Orono Land Trust
Project Share
Restore: The North Woods
Royal River Conservation Trust
Ruffed Grouse Society
Senator George Mitchell Center / Sustainability Solutions Initiative
Small Woodland Owners Association of Maine
Sportsmen's Alliance of Maine
Suffolk University
The Nature Conservancy
Trout Unlimited
University of Maine at Machias, School of Marine Sciences
University of Maine Department of Wildlife Ecology
University of Maine School of Forest Resources
University of Maine, School of Biological Sciences
University of New England
University of Southern Maine
Wells Reserve
Wildlife Alliance of Maine

TABLE 3. EXTENT OF COORDINATION WITH FEDERAL PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Federal Agencies	Acadia National Park	Maine Army National Guard	National Marine Fisheries Service (Maine Field Station)	Natural Resource Conservation Service	National Oceanic and Atmospheric Administration	U.S. Fish and Wildlife Service, Ecological Services	USFWS Gulf of Maine Coastal Program	USFWS Maine Fishery Resource Office	USFWS North Atlantic Landscape Conservation Cooperative	USFWS, Region 5	USFWS Aroostook National Wildlife Refuge	USFWS Maine Coastal Islands NWR	USFWS Moosehorn NWR	USFWS Rachel Carson NWR	U.S. Geological Survey, Maine Cooperative Fish and Wildlife Research Unit
Month / Year	Event																
May 2014	Invited to participate in 2015 action plan update		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
July 2014	Conservation Partners Meeting #1		X					X	X			X		X		X	X
	Maine Department of Marine Resources Information Session																
August 2014	Public Outreach Subcommittee Meeting																
September 2014	Landowners Meeting																
	Keeping Maine's Forests Implementation Committee																
	Steering Committee Meeting					X				X		X					
	MDIFW Advisory Council Meeting																
	Conservation Partners Meeting #2		X			X		X	X				X	X	X	X	

TABLE 3. EXTENT OF COORDINATION WITH FEDERAL PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Federal Agencies														
		Acadia National Park	Maine Army National Guard	National Marine Fisheries Service (Maine Field Station)	Natural Resource Conservation Service	National Oceanic and Atmospheric Administration	U.S. Fish and Wildlife Service, Ecological Services	USFWS Gulf of Maine Coastal Program	USFWS Maine Fishery Resource Office	USFWS North Atlantic Landscape Conservation Cooperative	USFWS, Region 5	USFWS Aroostook National Wildlife Refuge	USFWS Maine Coastal Islands NWR	USFWS Moosehorn NWR	USFWS Rachel Carson NWR	U.S. Geological Survey, Maine Cooperative Fish and Wildlife Research Unit
October 2014	Stanton Bird Club Annual Meeting															
	Society of American Foresters Fall Meeting															
	Steering Committee Meeting				X			X								
November 2014	Tribal Engagement Conference Call with USFWS															
	SFI-Fisheries Improvement Network															
	Conservation Partners Meeting #3						X	X			X	X				
	Steering Committee Meeting				X			X								
	Human Dimensions Meeting															
December 2014	Unity College Herpetology Class															
	Tribal Engagement Conference Call with USFWS															

TABLE 3. EXTENT OF COORDINATION WITH FEDERAL PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Federal Agencies														
		Acadia National Park	Maine Army National Guard	National Marine Fisheries Service (Maine Field Station)	Natural Resource Conservation Service	National Oceanic and Atmospheric Administration	U.S. Fish and Wildlife Service, Ecological Services	USFWS Gulf of Maine Coastal Program	USFWS Maine Fishery Resource Office	USFWS North Atlantic Landscape Conservation Cooperative	USFWS, Region 5	USFWS Aroostook National Wildlife Refuge	USFWS Maine Coastal Islands NWR	USFWS Moosehorn NWR	USFWS Rachel Carson NWR	U.S. Geological Survey, Maine Cooperative Fish and Wildlife Research Unit
	Steering Committee Meeting				X					X						
	Tribal Engagement Conference Call															
January 2015	Conservation Partner Meeting #4	X						X						X		
	Steering Committee Meeting				X											
February 2015	Steering Committee Meeting								X							
	Open Standards Training				X				X							
	Marine/Coastal/Aquatic Conservation Proposal Brainstorming								X							
	Terrestrial/Wetland Conservation Proposal Brainstorming				X											
March 2015	NE Cottontail Working Group Annual Meeting															
	Eastern Maine Sportsman Show															

TABLE 3. EXTENT OF COORDINATION WITH FEDERAL PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Federal Agencies														
		Acadia National Park	Maine Army National Guard	National Marine Fisheries Service (Maine Field Station)	Natural Resource Conservation Service	National Oceanic and Atmospheric Administration	U.S. Fish and Wildlife Service, Ecological Services	USFWS Gulf of Maine Coastal Program	USFWS Maine Fishery Resource Office	USFWS North Atlantic Landscape Conservation Cooperative	USFWS, Region 5	USFWS Aroostook National Wildlife Refuge	USFWS Maine Coastal Islands NWR	USFWS Moosehorn NWR	USFWS Rachel Carson NWR	U.S. Geological Survey, Maine Cooperative Fish and Wildlife Research Unit
	Theme Development Meeting															
	Steering Committee Review of Habitat Conservation Actions															
	Maine Land Trust Network Conference Workshop															
May 2015																
	York County Community College Environmental Science Class															
	Maine Association of Conservation Commissions Annual Meeting															
	Steering Committee Meeting				X			X								
June 2015																
	Steering Committee Meeting				X			X				X			X	
	Maine Forest Products Council Presentation															
	Landowner Meeting															
	Conservation Partners Meeting #5															

TABLE 3. EXTENT OF COORDINATION WITH FEDERAL PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Federal Agencies													
		Acadia National Park	Maine Army National Guard	National Marine Fisheries Service (Maine Field Station)	Natural Resource Conservation Service	National Oceanic and Atmospheric Administration	U.S. Fish and Wildlife Service, Ecological Services	USFWS Gulf of Maine Coastal Program	USFWS Maine Fishery Resource Office	USFWS North Atlantic Landscape Conservation Cooperative	USFWS, Region 5	USFWS Aroostook National Wildlife Refuge	USFWS Maine Coastal Islands NWR	USFWS Moosehorn NWR	USFWS Rachel Carson NWR
July 2015															
	Maine Healthy Beaches Conference and Workshop														
	30-day Public Comment Period on Draft Action Plan														
August 2015															
	MDIFW Response to Public Comments														

TABLE 4. EXTENT OF COORDINATION WITH STATE PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		State Agencies																
		Baxter State Park Authority	DACF(1) Bureau of Agriculture, Resource Development Division	DACF Bureau of Agriculture, Food, and Rural Resources	DACF Land Use Planning Commission	DACF Lands for Maine's Future Program	DACF Maine Coastal Program	DACF Maine Forest Service	DACF Maine Natural Areas Program	DACF Municipal Planning Assistance Program	DACF Bureau of Parks and Lands	Dept. of Environmental Protection	Dept. of Marine Resources	Maine Dept. of Inland Fisheries and Wildlife, Advisory Council	Dept. of Transportation, Environmental Office	Maine Army National Guard		
Month / Year	Event																	
May 2014	Invited to participate in 2015 action plan update	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
July 2014	Conservation Partners Meeting #1				X		X	X	X					X			X	
	Maine Department of Marine Resources Information Session																	
August 2014	Public Outreach Subcommittee Meeting											X						
September 2014	Landowners Meeting																	
	Keeping Maine's Forests Implementation Committee																	
	Steering Committee Meeting									X								
	MDIFW Advisory Council Meeting													X				
	Conservation Partners Meeting #2				X		X	X	X		X				X	X		

TABLE 4. EXTENT OF COORDINATION WITH STATE PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		State Agencies																
		Baxter State Park Authority	DACF(1) Bureau of Agriculture, Resource Development Division	DACF Bureau of Agriculture, Food, and Rural Resources	DACF Land Use Planning Commission	DACF Lands for Maine's Future Program	DACF Maine Coastal Program	DACF Maine Forest Service	DACF Maine Natural Areas Program	DACF Municipal Planning Assistance Program	DACF Bureau of Parks and Lands	Dept. of Environmental Protection	Dept. of Marine Resources	Maine Dept. of Inland Fisheries and Wildlife, Advisory Council	Dept. of Transportation, Environmental Office	Maine Army National Guard		
October 2014	Stanton Bird Club Annual Meeting																	
	Society of American Foresters Fall Meeting																	
	Steering Committee Meeting									X								
November 2014	Tribal Engagement Conference Call with USFWS																	
	SFI-Fisheries Improvement Network																	
	Conservation Partners Meeting #3			X				X		X				X				
	Steering Committee Meeting									X								
	Human Dimensions Meeting																	
December 2014	Unity College Herpetology Class																	
	Tribal Engagement																	

TABLE 4. EXTENT OF COORDINATION WITH STATE PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		State Agencies															
		Baxter State Park Authority	DACF(1) Bureau of Agriculture, Resource Development Division	DACF Bureau of Agriculture, Food, and Rural Resources	DACF Land Use Planning Commission	DACF Lands for Maine's Future Program	DACF Maine Coastal Program	DACF Maine Forest Service	DACF Maine Natural Areas Program	DACF Municipal Planning Assistance Program	DACF Bureau of Parks and Lands	Dept. of Environmental Protection	Dept. of Marine Resources	Maine Dept. of Inland Fisheries and Wildlife, Advisory Council	Dept. of Transportation, Environmental Office	Maine Army National Guard	
	Conference Call with USFWS																
	Steering Committee Meeting								X								
	Tribal Engagement Conference Call																
January 2015	Conservation Partner Meeting #4			X	X		X		X			X		X			
	Steering Committee Meeting								X								
February 2015	Steering Committee Meeting						X		X								
	Open Standards Training						X		X			X					
	Marine/Coastal/Aquatic Conservation Proposal Brainstorming						X					X					
	Terrestrial/Wetland Conservation Proposal Brainstorming						X		X								
March 2015	NE Cottontail Working Group Annual Meeting																
	Eastern Maine																

TABLE 4. EXTENT OF COORDINATION WITH STATE PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		State Agencies														
		Baxter State Park Authority	DACF(1) Bureau of Agriculture, Resource Development Division	DACF Bureau of Agriculture, Food, and Rural Resources	DACF Land Use Planning Commission	DACF Lands for Maine's Future Program	DACF Maine Coastal Program	DACF Maine Forest Service	DACF Maine Natural Areas Program	DACF Municipal Planning Assistance Program	DACF Bureau of Parks and Lands	Dept. of Environmental Protection	Dept. of Marine Resources	Maine Dept. of Inland Fisheries and Wildlife, Advisory Council	Dept. of Transportation, Environmental Office	Maine Army National Guard
	Sportsman Show															
	Steering Committee Meeting											X				
	Presque Isle Sportsman Show															
	Maine Association of Wetland Scientists Annual Meeting															
	Maine Tribal Engagement Meeting															
	State of Maine Sportsman Show															
	Maine Dept. of Transportation Meeting on Invasive Species Actions													X		
	Brunswick Conservation Commission Presentation															
April 2015	Steering Committee Meeting						X		X			X				
	Marine/Coastal Conservation Action Theme Development Meeting															

TABLE 4. EXTENT OF COORDINATION WITH STATE PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		State Agencies																
		Baxter State Park Authority	DACF(1) Bureau of Agriculture, Resource Development Division	DACF Bureau of Agriculture, Food, and Rural Resources	DACF Land Use Planning Commission	DACF Lands for Maine's Future Program	DACF Maine Coastal Program	DACF Maine Forest Service	DACF Maine Natural Areas Program	DACF Municipal Planning Assistance Program	DACF Bureau of Parks and Lands	Dept. of Environmental Protection	Dept. of Marine Resources	Maine Dept. of Inland Fisheries and Wildlife, Advisory Council	Dept. of Transportation, Environmental Office	Maine Army National Guard		
	Terrestrial/Wetland Conservation Action Theme Development Meeting																	
	Steering Committee Review of Habitat Conservation Actions						X		X					X				
	Maine Land Trust Network Conference Workshop																	
May 2015																		
	York County Community College Environmental Science Class																	
	Maine Association of Conservation Commissions Annual Meeting																	
	Steering Committee Meeting						X		X									
June 2015																		
	Steering Committee Meeting																	
	Maine Forest Products Council Presentation																	

TABLE 4. EXTENT OF COORDINATION WITH STATE PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		State Agencies															
		Baxter State Park Authority	DACF(1) Bureau of Agriculture, Resource Development Division	DACF Bureau of Agriculture, Food, and Rural Resources	DACF Land Use Planning Commission	DACF Lands for Maine's Future Program	DACF Maine Coastal Program	DACF Maine Forest Service	DACF Maine Natural Areas Program	DACF Municipal Planning Assistance Program	DACF Bureau of Parks and Lands	Dept. of Environmental Protection	Dept. of Marine Resources	Maine Dept. of Inland Fisheries and Wildlife, Advisory Council	Dept. of Transportation, Environmental Office	Maine Army National Guard	
	Landowner Meeting																
	Conservation Partners Meeting #5				X	X	X		X	X					X		
July 2015																	
	Maine Healthy Beaches Conference and Workshop																
	30-day Public Comment Period on Draft Action Plan																
August 2015																	
	MDIFW Response to Public Comments																
(1) Dept. of Agriculture, Conservation, and Forestry																	

TABLE 5. EXTENT OF COORDINATION WITH TRIBAL AND LOCAL PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Tribal Partners	Aroostook Band or MicMac Indians	Houlton Band of Maliseet Indians	Passamaquoddy Tribe, Indian Township Reservation	Passamaquoddy Tribe, Pleasant Point Reservation	Penobscot Nation	Local Partners	Maine Association of Conservation Commissions	Maine Association of Planners								
Month / Year	Event																	
May 2014	Invited to participate in 2015 action plan update	X	X	X	X	X	X	X	X	X								
July 2014	Conservation Partners Meeting #1						X			X								
	Maine Department of Marine Resources Information Session																	
August 2014	Public Outreach Subcommittee Meeting																	
September 2014	Landowners Meeting																	
	Keeping Maine's Forests Implementation Committee																	
	Steering Committee Meeting																	
	MDIFW Advisory Council Meeting																	
	Conservation Partners Meeting #2																	

TABLE 5. EXTENT OF COORDINATION WITH TRIBAL AND LOCAL PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Tribal Partners						Local Partners									
		Aroostook Band or MicMac Indians	Houlton Band of Maliseet Indians	Passamaquoddy Tribe, Indian Township Reservation	Passamaquoddy Tribe, Pleasant Point Reservation	Penobscot Nation	Maine Association of Conservation Commissions	Maine Association of Planners									
October 2014	Stanton Bird Club Annual Meeting																
	Society of American Foresters Fall Meeting																
	Steering Committee Meeting																
November 2014	Tribal Engagement Conference Call with USFWS																
	SFI-Fisheries Improvement Network																
	Conservation Partners Meeting #3																
	Steering Committee Meeting																
	Human Dimensions Meeting																
December 2014	Unity College Herpetology Class																
	Tribal Engagement Conference Call with USFWS																

TABLE 5. EXTENT OF COORDINATION WITH TRIBAL AND LOCAL PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Tribal Partners						Local Partners						
		Aroostook Band or MicMac Indians	Houlton Band of Maliseet Indians	Passamaquoddy Tribe, Indian Township Reservation	Passamaquoddy Tribe, Pleasant Point Reservation	Penobscot Nation	Maine Association of Conservation Commissions	Maine Association of Planners						
	Steering Committee Meeting													
	Tribal Engagement Conference Call													
January 2015	Conservation Partner Meeting #4													
	Steering Committee Meeting													
February 2015	Steering Committee Meeting													
	Open Standards Training													
	Marine/Coastal/Aquatic Conservation Proposal Brainstorming													
	Terrestrial/Wetland Conservation Proposal Brainstorming													
March 2015	NE Cottontail Working Group Annual Meeting													
	Eastern Maine Sportsman Show													

TABLE 5. EXTENT OF COORDINATION WITH TRIBAL AND LOCAL PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Tribal Partners						Local Partners														
		Aroostook Band or MicMac Indians	Houlton Band of Maliseet Indians	Passamaquoddy Tribe, Indian Township Reservation	Passamaquoddy Tribe, Pleasant Point Reservation	Penobscot Nation	Maine Association of Conservation Commissions	Maine Association of Planners														
	Steering Committee Meeting																					
	Presque Isle Sportsman Show																					
	Maine Association of Wetland Scientists Annual Meeting																					
	Maine Tribal Engagement Meeting	X	X	X	X	X	X															
	State of Maine Sportsman Show																					
	Maine Dept. of Transportation Meeting on Invasive Species Actions																					
	Brunswick Conservation Commission Presentation																					
April 2015	Steering Committee Meeting																					
	Marine/Coastal Conservation Action Theme Development Meeting																					
	Terrestrial/Wetland Conservation Action																					

TABLE 5. EXTENT OF COORDINATION WITH TRIBAL AND LOCAL PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Tribal Partners						Local Partners															
		Aroostook Band or MicMac Indians	Houlton Band of Maliseet Indians	Passamaquoddy Tribe, Indian Township Reservation	Passamaquoddy Tribe, Pleasant Point Reservation	Penobscot Nation	Maine Association of Conservation Commissions	Maine Association of Planners															
	Theme Development Meeting																						
	Steering Committee Review of Habitat Conservation Actions																						
	Maine Land Trust Network Conference Workshop																						
May 2015																							
	York County Community College Environmental Science Class																						
	Maine Association of Conservation Commissions Annual Meeting								X														
	Steering Committee Meeting																						
June 2015																							
	Steering Committee Meeting																						
	Maine Forest Products Council Presentation																						
	Landowner Meeting																						
	Conservation Partners Meeting #5																						

TABLE 5. EXTENT OF COORDINATION WITH TRIBAL AND LOCAL PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Tribal Partners						Local Partners												
		Aroostook Band of MicMac Indians	Houlton Band of Maliseet Indians	Passamaquoddy Tribe, Indian Township Reservation	Passamaquoddy Tribe, Pleasant Point Reservation	Penobscot Nation	Maine Association of Conservation Commissions	Maine Association of Planners												
July 2015																				
	Maine Healthy Beaches Conference and Workshop																			
	30-day Public Comment Period on Draft Action Plan																			
August 2015																				
	MDIFW Response to Public Comments																			

TABLE 6.1. EXTENT OF COORDINATION WITH PUBLIC PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Members of the General Public		Partner Organizations	Appalachian Conservation Biology	Atlantic Salmon Federation	Biodiversity Research Institute	Brunswick-Topsham Land Trust	Casco Bay Estuary Project	Coastal Mountains Land Trust	Conservation Law Foundation, Maine Advocacy Center	Cornell University	Defenders of Wildlife	Downeast Lakes Land Trust	Downeast Salmon Federation	Ducks Unlimited	Endangered Species Coalition	Forest Society of Maine	GrowSmart Maine	Gulf or Maine Research Institute	Island Institute	Lakes Environmental Association	Maine Aquaculture Association	Maine Association of Wetland Scientists	Maine Audubon Society	Maine Birding Trail	Maine Bowhunters Association
Month / Year	Event																										
May 2014	Invited to participate in 2015 action plan update				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
July 2014	Conservation Partners Meeting #1						X	X										X					X	X		X	
	Maine Department of Marine Resources Information Session																										
August 2014	Public Outreach Subcommittee Meeting																								X		
September 2014	Landowners Meeting							X										X									
	Keeping Maine's Forests Implementation Committee	X																									
	Steering Committee Meeting						X																	X			
	MDIFW Advisory Council Meeting																										
	Conservation Partners Meeting #2				X				X					X			X	X						X	X	X	

TABLE 6.1. EXTENT OF COORDINATION WITH PUBLIC PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Members of the General Public		Partner Organizations	Appalachian Conservation Biology	Atlantic Salmon Federation	Biodiversity Research Institute	Brunswick-Topsham Land Trust	Casco Bay Estuary Project	Coastal Mountains Land Trust	Conservation Law Foundation, Maine Advocacy Center	Cornell University	Defenders of Wildlife	Downeast Lakes Land Trust	Downeast Salmon Federation	Ducks Unlimited	Endangered Species Coalition	Forest Society of Maine	GrowSmart Maine	Gulf or Maine Research Institute	Island Institute	Lakes Environmental Association	Maine Aquaculture Association	Maine Association of Wetland Scientists	Maine Audubon Society	Maine Birding Trail	Maine Bowhunters Association
October 2014	Stanton Bird Club Annual Meeting	X																									
	Society of American Foresters Fall Meeting	X																									
	Steering Committee Meeting						X																		X		
November 2014	Tribal Engagement Conference Call with USFWS																										
	SFI-Fisheries Improvement Network	X																									
	Conservation Partners Meeting #3								X					X									X	X	X		
	Steering Committee Meeting						X																		X		
	Human Dimensions Meeting																										
December 2014	Unity College Herpetology Class	X																									
	Tribal Engagement Conference Call with USFWS																										

TABLE 6.1. EXTENT OF COORDINATION WITH PUBLIC PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Members of the General Public		Partner Organizations		Appalachian Conservation Biology	Atlantic Salmon Federation	Biodiversity Research Institute	Brunswick-Topsham Land Trust	Casco Bay Estuary Project	Coastal Mountains Land Trust	Conservation Law Foundation, Maine Advocacy Center	Cornell University	Defenders of Wildlife	Downeast Lakes Land Trust	Downeast Salmon Federation	Ducks Unlimited	Endangered Species Coalition	Forest Society of Maine	GrowSmart Maine	Gulf or Maine Research Institute	Island Institute	Lakes Environmental Association	Maine Aquaculture Association	Maine Association of Wetland Scientists	Maine Audubon Society	Maine Birding Trail	Maine Bowhunters Association
	Steering Committee Meeting								X																	X		
	Tribal Engagement Conference Call																											
January 2015	Conservation Partner Meeting #4									X														X				
	Steering Committee Meeting																								X			
February 2015	Steering Committee Meeting								X																	X		
	Open Standards Training								X																	X		
	Marine/Coastal/Aquatic Conservation Proposal Brainstorming									X						X									X			
	Terrestrial/Wetland Conservation Proposal Brainstorming																		X							X		
March 2015	NE Cottontail Working Group Annual Meeting	X																										
	Eastern Maine Sportsman Show	X																										
	Steering Committee Meeting								X																	X		

TABLE 6.1. EXTENT OF COORDINATION WITH PUBLIC PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Members of the General Public		Partner Organizations																							
				Appalachian Conservation Biology	Atlantic Salmon Federation	Biodiversity Research Institute	Brunswick-Topsham Land Trust	Casco Bay Estuary Project	Coastal Mountains Land Trust	Conservation Law Foundation, Maine Advocacy Center	Cornell University	Defenders of Wildlife	Downeast Lakes Land Trust	Downeast Salmon Federation	Ducks Unlimited	Endangered Species Coalition	Forest Society of Maine	GrowSmart Maine	Gulf or Maine Research Institute	Island Institute	Lakes Environmental Association	Maine Aquaculture Association	Maine Association of Wetland Scientists	Maine Audubon Society	Maine Birding Trail	Maine Bowhunters Association	
	Presque Isle Sportsman Show	X																									
	Maine Association of Wetland Scientists Annual Meeting																					X					
	Maine Tribal Engagement Meeting																										
	State of Maine Sportsman Show	X																									
	Maine Dept. of Transportation Meeting on Invasive Species Actions																										
	Brunswick Conservation Commission Presentation	X																									
April 2015	Steering Committee Meeting																								X		
	Marine/Coastal Conservation Action Theme Development Meeting												X														
	Terrestrial/Wetland Conservation Action Theme Development Meeting																										
	Steering Committee Review																										

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	of Habitat Conservation Actions																										
	Maine Land Trust Network Conference Workshop	X																									
May 2015																											
	York County Community College Environmental Science Class	X																									
	Maine Association of Conservation Commissions Annual Meeting	X																									
	Steering Committee Meeting																								X		
June 2015																											
	Steering Committee Meeting																										
	Maine Forest Products Council Presentation																										
	Landowner Meeting																										
	Conservation Partners Meeting #5	X															X						X	X	X		
July 2015																											
	Maine Healthy Beaches Conference and Workshop	X																									

TABLE 6.1. EXTENT OF COORDINATION WITH PUBLIC PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Members of the General Public		Partner Organizations	Appalachian Conservation Biology	Atlantic Salmon Federation	Biodiversity Research Institute	Brunswick-Topsham Land Trust	Casco Bay Estuary Project	Coastal Mountains Land Trust	Conservation Law Foundation, Maine Advocacy Center	Cornell University	Defenders of Wildlife	Downeast Lakes Land Trust	Downeast Salmon Federation	Ducks Unlimited	Endangered Species Coalition	Forest Society of Maine	GrowSmart Maine	Gulf or Maine Research Institute	Island Institute	Lakes Environmental Association	Maine Aquaculture Association	Maine Association of Wetland Scientists	Maine Audubon Society	Maine Birding Trail	Maine Bowhunters Association
	30-day Public Comment Period on Draft Action Plan	X																									
August 2015	MDIFW Response to Public Comments	X																									

TABLE 6.2. EXTENT OF COORDINATION WITH PUBLIC PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Maine Chamber of Commerce	Maine Chapter of the Sierra Club	Maine Chapter or the Wildlife Society	Maine Coast Heritage Trust	Maine Discovery Museum	Maine Farm Bureau	Maine Farmland Trust	Maine Forest Products Council	Maine Lakes Society	Maine Maritime Academy	Maine Professional Guides Association	Maine Rivers	Maine SeaGrant	Maine Tourism Association	Maine Trappers Association	Maine Teaming with Wildlife – State Wildlife Grant Coalition	Manomet Center for Conservation Science	Mt. Agameticus to the Sea	National Wild Turkey Federation	Natural Resources Council of Maine	North Maine Woods	Northern Maine Partner	Orono Land Trust	Project Share	Restore: The North Woods
Month / Year	Event																									
May 2014	Invited to participate in 2015 action plan update	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
July 2014	Conservation Partners Meeting #1			X	X		X						X	X	X	X	X	X	X					X		
	Maine Department of Marine Resources Information Session																									
August 2014	Public Outreach Subcommittee Meeting								X																	
September 2014	Landowners Meeting						X		X																	
	Keeping Maine's Forests Implementation Committee																									
	Steering Committee Meeting																									
	MDIFW Advisory Council Meeting																									
	Conservation Partners Meeting #2			X	X		X		X			X		X	X	X	X							X		X

TABLE 6.2. EXTENT OF COORDINATION WITH PUBLIC PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Maine Chamber of Commerce	Maine Chapter of the Sierra Club	Maine Chapter or the Wildlife Society	Maine Coast Heritage Trust	Maine Discovery Museum	Maine Farm Bureau	Maine Farmland Trust	Maine Forest Products Council	Maine Lakes Society	Maine Maritime Academy	Maine Professional Guides Association	Maine Rivers	Maine SeaGrant	Maine Tourism Association	Maine Trappers Association	Maine Teaming with Wildlife – State Wildlife Grant Coalition	Manomet Center for Conservation Science	Mt. Agamenticus to the Sea	National Wild Turkey Federation	Natural Resources Council of Maine	North Maine Woods	Northern Maine Partner	Orono Land Trust	Project Share	Restore: The North Woods
October 2014	Stanton Bird Club Annual Meeting																									
	Society of American Foresters Fall Meeting																									
	Steering Committee Meeting								X																	
November 2014	Tribal Engagement Conference Call with USFWS																									
	SFI-Fisheries Improvement Network																									
	Conservation Partners Meeting #3			X		X		X					X		X	X							X	X		
	Steering Committee Meeting				X			X																		
	Human Dimensions Meeting																									
December 2014	Unity College Herpetology Class																									
	Tribal Engagement Conference Call with																									

TABLE 6.2. EXTENT OF COORDINATION WITH PUBLIC PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Maine Chamber of Commerce	Maine Chapter of the Sierra Club	Maine Chapter or the Wildlife Society	Maine Coast Heritage Trust	Maine Discovery Museum	Maine Farm Bureau	Maine Farmland Trust	Maine Forest Products Council	Maine Lakes Society	Maine Maritime Academy	Maine Professional Guides Association	Maine Rivers	Maine SeaGrant	Maine Tourism Association	Maine Trappers Association	Maine Teaming with Wildlife – State Wildlife Grant Coalition	Manomet Center for Conservation Science	Mt. Agamenticus to the Sea	National Wild Turkey Federation	Natural Resources Council of Maine	North Maine Woods	Northern Maine Partner	Orono Land Trust	Project Share	Restore: The North Woods
	USFWS																									
	Steering Committee Meeting				X				X																	X
	Tribal Engagement Conference Call																									
January 2015	Conservation Partner Meeting #4											X		X												
	Steering Committee Meeting																									
February 2015	Steering Committee Meeting				X				X																	
	Open Standards Training				X																					
	Marine/Coastal/Aquatic Conservation Proposal Brainstorming				X								X													
	Terrestrial/Wetland Conservation Proposal Brainstorming								X								X	X						X		
March 2015	NE Cottontail Working Group Annual Meeting																									
	Eastern Maine Sportsman Show																									
	Steering Committee				X				X																	

TABLE 6.2. EXTENT OF COORDINATION WITH PUBLIC PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Maine Chamber of Commerce	Maine Chapter of the Sierra Club	Maine Chapter or the Wildlife Society	Maine Coast Heritage Trust	Maine Discovery Museum	Maine Farm Bureau	Maine Farmland Trust	Maine Forest Products Council	Maine Lakes Society	Maine Maritime Academy	Maine Professional Guides Association	Maine Rivers	Maine SeaGrant	Maine Tourism Association	Maine Trappers Association	Maine Teaming with Wildlife – State Wildlife Grant Coalition	Manomet Center for Conservation Science	Mt. Agamenticus to the Sea	National Wild Turkey Federation	Natural Resources Council of Maine	North Maine Woods	Northern Maine Partner	Orono Land Trust	Project Share	Restore: The North Woods
	Meeting																									
	Presque Isle Sportsman Show																									
	Maine Ass'n of Wetland Scientists Annual Meeting																									
	Maine Tribal Engagement Meeting																									
	State of Maine Sportsman Show																									
	Maine Dept. of Transportation Meeting on Invasive Species Actions																									
	Brunswick Conservation Commission Presentation																									
April 2015	Steering Committee Meeting								X																	
	Marine/Coastal Conservation Action Theme Development Meeting																									
	Terrestrial/Wetland Conservation Action Theme Development Meeting																									

TABLE 6.2. EXTENT OF COORDINATION WITH PUBLIC PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Maine Chamber of Commerce	Maine Chapter of the Sierra Club	Maine Chapter or the Wildlife Society	Maine Coast Heritage Trust	Maine Discovery Museum	Maine Farm Bureau	Maine Farmland Trust	Maine Forest Products Council	Maine Lakes Society	Maine Maritime Academy	Maine Professional Guides Association	Maine Rivers	Maine SeaGrant	Maine Tourism Association	Maine Trappers Association	Maine Teaming with Wildlife – State Wildlife Grant Coalition	Manomet Center for Conservation Science	Mt. Agamenticus to the Sea	National Wild Turkey Federation	Natural Resources Council of Maine	North Maine Woods	Northern Maine Partner	Orono Land Trust	Project Share	Restore: The North Woods
	Steering Committee Review of Habitat Conservation Actions																									
	Maine Land Trust Network Conference Workshop																									
May 2015																										
	York County Community College Environmental Science Class																									
	Maine Ass'n of Conservation Commissions Annual Meeting																									
	Steering Committee Meeting								X																	
June 2015																										
	Steering Committee Meeting																									
	Maine Forest Products Council Presentation																									
	Landowner Meeting																									
	Conservation Partners Meeting #5			X	X							X		X		X										X

TABLE 6.2. EXTENT OF COORDINATION WITH PUBLIC PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Maine Chamber of Commerce	Maine Chapter of the Sierra Club	Maine Chapter or the Wildlife Society	Maine Coast Heritage Trust	Maine Discovery Museum	Maine Farm Bureau	Maine Farmland Trust	Maine Forest Products Council	Maine Lakes Society	Maine Maritime Academy	Maine Professional Guides Association	Maine Rivers	Maine SeaGrant	Maine Tourism Association	Maine Trappers Association	Maine Teaming with Wildlife – State Wildlife Grant Coalition	Manomet Center for Conservation Science	Mt. Agamenticus to the Sea	National Wild Turkey Federation	Natural Resources Council of Maine	North Maine Woods	Northern Maine Partner	Orono Land Trust	Project Share	Restore: The North Woods
July 2015																										
	Maine Healthy Beaches Conference and Workshop																									
	30-day Public Comment Period on Draft Action Plan																									
August 2015																										
	MDIFW Response to Public Comments																									

TABLE 6.3. EXTENT OF COORDINATION WITH PUBLIC PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Royal River Conservation Trust	Ruffed Grouse Society	Senator George Mitchell Center / Sustainability Solutions Initiative	Small Woodland Owners Association of Maine	Sportsmen's Alliance of Maine	Suffolk University	The Nature Conservancy	Trout Unlimited	University of Maine, Machias School of Marine Sciences	University of Maine, Orono School of Forest Resources and Dept. of Wildlife Ecology	University of Maine, Orono School of Biological Sciences	University of New England	University of Southern Maine	Wells Estuarine Reserve	Wildlife Alliance of Maine
Month / Year	Event															
May 2014	Invited to participate in 2015 action plan update	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
July 2014	Conservation Partners Meeting #1				X			X			X				X	X
	Maine Department of Marine Resources Information Session															
August 2014	Public Outreach Subcommittee Meeting										X					
September 2014	Landowners Meeting				X			X								
	Keeping Maine's Forests Implementation Committee															
	Steering Committee Meeting				X			X								
	MDIFW Advisory Council Meeting															
	Conservation Partners Meeting #2					X		X	X		X				X	

TABLE 6.3. EXTENT OF COORDINATION WITH PUBLIC PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Royal River Conservation Trust	Ruffed Grouse Society	Senator George Mitchell Center / Sustainability Solutions Initiative	Small Woodland Owners Association of Maine	Sportsmen's Alliance of Maine	Suffolk University	The Nature Conservancy	Trout Unlimited	University of Maine, Machias School of Marine Sciences	University of Maine, Orono School of Forest Resources and Dept. of Wildlife Ecology	University of Maine, Orono School of Biological Sciences	University of New England	University of Southern Maine	Wells Estuarine Reserve	Wildlife Alliance of Maine
October 2014	Stanton Bird Club Annual Meeting															
	Society of American Foresters Fall Meeting															
	Steering Committee Meeting				X		X									
November 2014	Tribal Engagement Conference Call with USFWS															
	SFI-Fisheries Improvement Network															
	Conservation Partners Meeting #3					X		X		X						
	Steering Committee Meeting						X									
	Human Dimensions Meeting									X						
December 2014	Unity College Herpetology Class															
	Tribal Engagement															

TABLE 6.3. EXTENT OF COORDINATION WITH PUBLIC PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Royal River Conservation Trust	Ruffed Grouse Society	Senator George Mitchell Center / Sustainability Solutions Initiative	Small Woodland Owners Association of Maine	Sportsmen's Alliance of Maine	Suffolk University	The Nature Conservancy	Trout Unlimited	University of Maine, Machias School of Marine Sciences	University of Maine, Orono School of Forest Resources and Dept. of Wildlife Ecology	University of Maine, Orono School of Biological Sciences	University of New England	University of Southern Maine	Wells Estuarine Reserve	Wildlife Alliance of Maine
	Conference Call with USFWS															
	Steering Committee Meeting				X			X								
	Tribal Engagement Conference Call															
January 2015	Conservation Partner Meeting #4															
	Steering Committee Meeting				X			X								
February 2015	Steering Committee Meeting							X								
	Open Standards Training							X								
	Marine/Coastal/Aquatic Conservation Proposal Brainstorming							X	X			X		X		
	Terrestrial/Wetland Conservation Proposal Brainstorming				X			X								
March 2015	NE Cottontail Working Group Annual Meeting															

TABLE 6.3. EXTENT OF COORDINATION WITH PUBLIC PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Royal River Conservation Trust	Ruffed Grouse Society	Senator George Mitchell Center / Sustainability Solutions Initiative	Small Woodland Owners Association of Maine	Sportsmen's Alliance of Maine	Suffolk University	The Nature Conservancy	Trout Unlimited	University of Maine, Machias School of Marine Sciences	University of Maine, Orono School of Forest Resources and Dept. of Wildlife Ecology	University of Maine, Orono School of Biological Sciences	University of New England	University of Southern Maine	Wells Estuarine Reserve	Wildlife Alliance of Maine
	Eastern Maine Sportsman Show															
	Steering Committee Meeting						X									
	Presque Isle Sportsman Show															
	Maine Association of Wetland Scientists Annual Meeting															
	Maine Tribal Engagement Meeting															
	State of Maine Sportsman Show															
	Maine Dept. of Transportation Meeting on Invasive Species Actions															
	Brunswick Conservation Commission Presentation															
April 2015	Steering Committee Meeting				X		X									
	Marine/Coastal									X						

TABLE 6.3. EXTENT OF COORDINATION WITH PUBLIC PARTNERS DURING THE DEVELOPMENT OF MAINE'S 2015 WILDLIFE ACTION PLAN		Royal River Conservation Trust	Ruffed Grouse Society	Senator George Mitchell Center / Sustainability Solutions Initiative	Small Woodland Owners Association of Maine	Sportsmen's Alliance of Maine	Suffolk University	The Nature Conservancy	Trout Unlimited	University of Maine, Machias School of Marine Sciences	University of Maine, Orono School of Forest Resources and Dept. of Wildlife Ecology	University of Maine, Orono School of Biological Sciences	University of New England	University of Southern Maine	Wells Estuarine Reserve	Wildlife Alliance of Maine
	Conservation Action Theme Development Meeting															
	Terrestrial/Wetland Conservation Action Theme Development Meeting															
	Steering Committee Review of Habitat Conservation Actions				X			X								
	Maine Land Trust Network Conference Workshop															
May 2015																
	York County Community College Environmental Science Class															
	Maine Association of Conservation Commissions Annual Meeting															
	Steering Committee Meeting							X								
June 2015																
	Steering Committee Meeting															

TABLE 6.3. EXTENT OF COORDINATION WITH PUBLIC PARTNERS DURING THE DEVELOPMENT OF MAINE’S 2015 WILDLIFE ACTION PLAN		Royal River Conservation Trust	Ruffed Grouse Society	Senator George Mitchell Center / Sustainability Solutions Initiative	Small Woodland Owners Association of Maine	Sportsmen’s Alliance of Maine	Suffolk University	The Nature Conservancy	Trout Unlimited	University of Maine, Machias School of Marine Sciences	University of Maine, Orono School of Forest Resources and Dept. of Wildlife Ecology	University of Maine, Orono School of Biological Sciences	University of New England	University of Southern Maine	Wells Estuarine Reserve	Wildlife Alliance of Maine
	Maine Forest Products Council Presentation															
	Landowner Meeting															
	Conservation Partners Meeting #5				X		X	X								
July 2015																
	Maine Healthy Beaches Conference and Workshop															
	30-day Public Comment Period on Draft Action Plan															
August 2015																
	MDIFW Response to Public Comments															

Appendix 1: Minutes of Steering Committee Meetings

**2015 Maine Wildlife Action Plan
Steering Committee – Meeting #1
September 18, 2014**

Attendees: Judy Camuso (IFW), Phillip deMaynadier (IFW), Tom Doak (SWOAM), Molly Docherty (MNAP), Mitch Hartley (USFWS), Jeff Norment (NRCS), Mark Stadler (IFW), Sally Stockwell (Maine Audubon), Charlie Todd (IFW), Angela Twitchell (BTLT), Barbara Vickery (TNC), Nate Webb (IFW), Jed Wright (USFWS)

Summary of Discussion

- MDIFW staff gave a brief overview of Wildlife Action Plan revisions with particular emphasis on themes identified in national guidance as well as MDIFW expectations.
 - Action Plan is a Conservation Plan for Maine, not just IFW
 - Plan will be developed & implemented in cooperation with partners
- Status report
 - 1st meeting with Conservation Partners on July 8th
 - Draft Public Outreach & Communication Plan
 - Meeting with landowners
 - Developed SGCN criteria and list (95% complete)
 - SGCN habitat associations in progress
- Monitoring Conservation Actions
 - How is success assessed/measured? What does success look like?
 - Must define metrics
 - 'Monitoring' does not mean species surveys
- Steering Committee Composition
 - Group should be small, but contain good representation.
 - Members should be broad-thinkers but do not necessarily have represent the complete diversity of partner organizations/perspectives.
 - May want to consider including a Sportsman's representative, and an Academic representative.

- Preference for face-to-face meetings as much as possible.
- Purpose of Steering Committee: Provide rapid guidance to IFW on important components of the Action Plan Update as issues arise. Review and provide input on agendas for Partner meetings. Determine the need for sub-committees.
- Action Plan Timeline: Should include Conservation Partner Meetings 4 & 5 on the timeline.
- Ad hoc “landowners committee.” Review scope of discussions from the first meeting on Sept. 11 at MDIFW.
- Marine Fauna: Need to continue work to integrate marine considerations into the Action Plan. Should have a marine-focused person on the Steering Committee. DMR is expressing more interest in becoming involved, drafted ~12 SGCN additions, still reviewing others with Maine Coastal Program, specified several specialty coastal habitats of particular significance, and identified several new partners. The need for a “marine fauna & habitats” subcommittee can be judged better after the 9/30 meeting but may help accelerate attention.
- 9/30 Meeting Agenda
 - Spend less time in background/introductions
 - Need to fully describe how the input on the SGCN list/criteria was used. Clarify why there are now 4 category groupings. Should make it clear to Partners that SGCN list concepts are now considered final unless additional SGCNs (especially marine fauna) are demonstrated to meet these finalized criteria.
 - It will be important to update partners on a conceptual new approach for plan prioritization (habitat focused / overlapping threats where possible) so they understand the importance of the habitat assignments & pending stressor classifications.
 - Need more time (2 hours) to discuss the Habitat Assignments in the break-out groups. Do not use rotations in the break session. Itemize topics to be addressed in each break out in the Meeting Agenda to generate interest & advance preparation.
 - Break-outs should include discussion of SGCN distribution (towns, watersheds, ecoregions etc.), and ways to identify priority habitats.
- Operational Charter: One charter should be developed for the entire Action Plan update process. The role of the Steering Committee (and other subcommittees) should be described within the charter.

- Decision Making: Steering Committee will attempt to reach consensus on all decisions. When this is not possible, as the administrator of the Plan, IFW will make the final decision. When/if they arise, these situations will be discussed with the full group of Partners.
- Next meeting: October 16th, 9 am-noon. Location: Viles Arboretum, Augusta.

**2015 Maine Wildlife Action Plan
Steering Committee – Meeting #2
October 16, 2014
Viles Arboretum, Augusta**

Attendees: Barry Burgason (MFPC), Judy Camuso (MDIFW), Phillip deMaynadier (MDIFW), Tom Doak (SWOAM), Molly Docherty (MNAP), Jeff Norment (NRCS), Mark Stadler (MDIFW), Sally Stockwell (Maine Audubon), Charlie Todd (MDIFW), Angela Twitchell (BTLT), Barbara Vickery (TNC), Nate Webb (MDIFW), Jed Wright (USFWS)

1. Additional representation on steering committee

Northern Maine: Andy Whitman suggested that the committee have greater representation from Northern Maine. He suggested the following:

Jensen Bissell or Jean Hoekwater, Baxter State Park
Aaron Megquier, friends of Baxter State Park
Peter Lowell, Lakes Education Association
Matt Libby, Libby Sporting Camps
Steve Young, former Fraser wildlife biologist
Tom Pelletier, broadly-based knowledge of the NMW and wildlife

The committee decided that such representation was better suited to the conservation partner group. **MDIFW** will review this list and invite individuals as appropriate.

Post meeting action: MDIFW invited Jean Hoekwater to participate in the action plan update during the initial outreach to conservation partners. **Mark Stadler** will contact Steve Young to ask him to participate as a conservation partner representing Northern Maine.

Maine tribes: **Amanda Shearin** will talk with the Fred Corey [Aroostook Band of MicMac Indians], Sharri Venno [Houlton Band of Maliseet Indians], John Sewell [Passamaquoddy Tribe: Indian Township Reservation], Marvin Cling [Passamaquoddy Tribe: Pleasant Point Reservation], and Kristin Peet [Penobscot Nation] to ask them to select a representative for the committee.

Agriculture: The committee considered the following:

Dave Bell, Wyman Blueberries
Don Flannery, Maine Potato Board
Dave Lavway, Maine Dept. of Conservation, Agriculture, and Forestry
Tom Gordon, Soil and Water Conservation District
thomas.u.gordon@myfairpoint.net
Maine Farm Bureau
Maine Organic Gardeners and Farmers Ass'n

After discussion the committee decided that agricultural interests would likely defer until the development of conservation actions. **MDIFW** will invite agricultural interests to be involved in the development and review of conservation actions.

Post meeting action: MDIFW invited Jon Olson, Maine Farm Bureau, to participate in the action plan update during the initial outreach to conservation partners. **Mark Stadler** will

invite Dave Lavway to participate as a conservation partner representing agricultural interests.

Marine: **Charlie Todd** will invite Claire Enterline, DMR, to participate. Claire may need funding assistance to participate.

2. Maine WAP / SGCN species: consideration of flora

[Refer to Barbara's email of 10/02, sent to steering committee]

The committee considered whether flora should receive SGCN designation; if flora should be entered into the action plan fauna database to create a holistic database; and the role that flora [non-habitat] should have in the action plan.

Committee members held differing views on each of these considerations.

After discussion the committee decided that 1] flora would not be designated as SGCN, 2] MNAP would add flora listed on Maine's threatened and endangered plant list to the MDIFW / DMR faunal database, and 3] that flora would be considered in the action plan to the extent that it helps to prioritize conservation actions for SGCN or SGCN habitats, including the identification of Focus Areas. Flora and their habitat associations will be included in the action plan as an appendix.

3. Operational charter

The committee reviewed and discussed the 10/16 draft of the operational charter. Much of the discussion centered around decision-making. **Mark Stadler** will consolidate the comments and prepare a revised draft for committee review.

4. Launching public outreach & communication plan

Deferred to next meeting

5. November 18 conservation partner meeting, Spectacular Events Center, Bangor

The committee requested that **MDIFW** seek outside peer review of habitat associations, and simultaneously commence discussion of habitat prioritization. It also asked **MDIFW** to provide it with a draft proposal for the mechanism to prioritize habitats.

The committee discussed the agenda and format for the 3rd conservation partner meeting.

Goals:

- Further consideration and wrap-up of SGCN habitat associations, element 2
- Introduction to criteria used to assess SGCN / habitat stressors, element 3
 - Review, discuss stressor assessment for priority 1 SGCN
 - Review, discuss stressor assessment for habitats
- Discuss process that the partners will use to prioritize 1) habitats and 2) habitat-stressors for conservation action.

Format:

- Morning plenary
- Two rounds of afternoon breakout groups
 - SGCN priority 1 threat assessment
 - Habitat threat assessment
- Breakout groups reports
- Element 4, conservation actions
- Wrap up discussion

6. Action Plan timeline and progress to date

Deferred

7. Archived AFWA/TWW SWAP webinars
Deferred

8. Next meeting: 9:00 – 12:00, November 20, 2014, at MDIFW

**Maine Wildlife Action Plan Steering Committee
November 20, 2014
0900 - 1200
MDIFW, Augusta**

Minutes of Meeting

~Review and approval of previous minutes:

10/16/2014 meeting minutes, #3, page 2: "The committee requested that **MDIFW** seek outside peer review of habitat associations...." Was revised to read that MDIFW will post the SGCN habitat associations online for public comment and it will notify conservation partners and the taxa specialists via email when the associations are posted.

The steering committee approved the minutes of the 09/18/2014 and the 10/16/2014 meetings.

~Additional members

Tribes

No nexus between tribal grants and state grants; tribal grants are competitive and have no requirement for match. What would be role of tribal rep on the steering committee -- helping to steer the plan itself; will one representative be able to adequately represent all of the tribes?

MDIFW will discuss with D.J. Monette, USFWS tribal liaison in the Northeast Region. Include USFWS liaison in contact w/ tribes.

Other discussion:

Sheri Venno, WAP conversation w/ tribes; she is contacting tribes for a group presentation.

Potential for individual focus groups: tribes, forestry, agriculture?

Roll out WAP to tribal councils. When is the right time to begin contact?

Northern Maine

Steve Young was invited to participate in conservation partner process and accepted. MDIFW will also invite Rich Hoppe and Amanda Demusz into the process.

Marine

The committee would like to invite Claire Enterline, DMR, to serve on the committee.

Both time commitment and funding are likely complications for Claire's involvement.

Judy will review possible funding via SWG planning grant; this may lead to further discussion with Deputy Commissioner at DMR.

~Updates

ET plants entered in to fauna database: MNAP has access to database; plants still to be entered, but in progress, will commence after 11/18 partner meeting

MDIFW will post Steering Committee minutes and subcommittee minutes on the action plan website. MDIFW and MNAP are preparing subcommittee minutes for posting.

The steering committee decided that Claire's "marine group" would not to be considered a subcommittee, but rather considered review by "outside experts" similar to review of SGCN list by outside taxa experts.

MDIFW will post SGCN habitat associations on the action plan website for additional partner and public review; MDIFW will send email to partners and taxa specialists when posted. MDIFW will wait until stressor assessment is completed and then will post both together. The committee discussed posting format and review process. Upon conclusion of review, MDIFW will post any changes with responses as appropriate. MDIFW will notify partners via email when changes are posed.

~Update from focus area review subcommittee: status report

- analysis
- freshwater aquatics
- coastal / marine

Andy Cutko, MNAP, presented an overview of the current work of the focus area review subcommittee. History of focus area, focus area selection criteria; under representation of aquatic and marine coastal resources. Holistic review of all existing focus areas; are we missing other high priority areas, also assess redundancy for finer prioritization for conservation action. Angela asked about the ability to assess conservation success within focus areas. Aquatic subcommittee, coastal subcommittee have been meeting since 07/2014. Have new and better information available. Subcommittee has conducted several rounds of review and assessment of existing focus areas. Able to assess the habitats types [habitat representation] contained across the spectrum of focus areas. Habitats in wildlife management areas. Discussion of criteria to identify focus areas, assess redundancy, consider prioritization mechanism. Discussion of time line for completion. [Andy's PowerPoint is posted on WAP webpage]

~Operational Charter – The steering committee approved the draft of the operational charter. MDIFW will post it on the action plan website.

Conservation partners, element 7

~Discussion of 11/18 conservation partner meeting

Stressor ranking matrix for both species and habitats needs further discussion. IUCN threat characteristic table --> severity, reversibility, [also consider spatial extent, immediacy?]; develop rules-of-thumb about how spatial extent and immediacy will be considered. MDIFW, DMR, MNAP will meet to develop a common approach for the assessment of stressor severity and reversibility.

Discussion of reconciling the action plan's 10-yr horizon with the need to begin addressing stresses and to make progress during the 10-year life of the plan. Should habitat stressors have modifier to capture seral stage considerations? No, these can be addressed in comments field.

MDIFW, MNAP, and DMR will complete stressor for SGCN P1 and P2 and for habitats. MDIFW will proceed with SGCN P2 threat assessment down to IUCN tier 2 and capture specific concerns in detailed comments. The committee discussed the need for consistency in the use of the "comments" field of the database; they suggested the use of key words.

~4th conservation partner meeting week of 01/20/2015

Discussion deferred to next steering committee meeting.

Public outreach, element 8

Deferred -- MDIFW presented an overview of the action plan public outreach process at the 11/18/2014 conservation partner meeting in Bangor.

~Other items

Maine Coast Heritage Trust / The Maine Land Conservation Conference

~Wrap-up thoughts, suggestions / next meeting

Barbara Vickery requested a presentation on regional conservation opportunity areas [RCOAs], conservation opportunity areas [COAs], and their requirement for specific spatial mapping.
Next steering committee 12/16/2014, 0900-1200. MDIFW, Augusta

**Maine Wildlife Action Plan Steering Committee
December 16, 2014
0900 - 1200
MDIFW, Augusta**

Present: Barry Bergason (MFPC), Judy Camuso (MDIFW), Phillip deMaynadier (MDIFW), Tom Doak (SWOAM), Molly Docherty (MNAP), Don Katnik (MDIFW), Jeff Norment (NRCS), Amanda Shearin (MDIFW), Mark Stadler (MDIFW), Sally Stockwell (Maine Audubon), Charlie Todd (MDIFW), Angela Twitchell (BTLT), Barbara Vickery (TNC), Nate Webb (MDIFW), Chandler Woodcock (MDIFW), Jed Wright (USFWS)

Bold = action item

~Welcome by Commissioner Woodcock

~Minutes of 11/20/14 Meeting: Approved as written

~Additional members

Tribes: MDIFW had a conference call with D.J. Monette, USFWS tribal liaison in the Northeast Region to discuss a process to integrate the tribes in to Maine's action plan update. D.J. suggested that Maine meet with the tribes as a group to 1) introduce them to the update process, 2) discuss how the tribes can be involved in the update, and 3) consider how the Maine and tribal action plans can be integrated. Sherri Venno is currently coordinating this event which is tentatively scheduled for February. D.J. will come to Maine to attend and facilitate discussion. Next steps for **MDIFW**: follow-up call with D.J. to prepare for the February meeting. Molly suggested that Maine's update should assess the contribution that tribal lands provide for the conservation of SGCN.

DMR: The committee would like to invite Claire Enterline, DMR, to serve on the committee. Both time commitment and funding are likely complications for Claire's involvement. MDIFW and DNR are developing an MOU for Claire's time and financial support with funding from the SWG planning grant. Judy is exploring how to obtain the required match. Molly indicated that Maine Natural Areas Program [MNAP] may be able to help leverage match.

Northern Maine: MDIFW invited Rich Hoppe and Amanda Demusz [MDIFW Region G] to participate.

Sportsmen: Judy talked with Dave Trahan, Sportsmen's Alliance of Maine, regarding involvement of sportsmen and women in the action plan update. He indicated that Gary Corson is SAM's representative for fisheries consideration; Dave said that he or his designee may attend the next partner meeting to represent SAM's wildlife interests.

~Updates

MNAP has completed entry of plant data [and taxonomy] in the fauna/flora database, including linkages to habitat types. Not sure if reporting functions are complete yet.

Posting online: MDIFW has posted steering committee minutes. **MDIFW and MNAP** are preparing subcommittee minutes for posting. The steering committee requested that **MDIFW**

post habitat types, SGCN habitat associations, and SGCN / habitat stressor assessment on the action plan website for additional partner and public review. MDIFW plans to post ~370 reports by the end of December or early January. Marine habitat associations are being completed this week and next. Terrestrial associations are finished (in draft form). Fisheries / freshwater information is ready for posting; MDIFW will notify Gary Corson and Jeff Reardon when posted. DMR is continuing to develop the applicable marine information. **MDIFW** will send email to partners and taxa specialists when posted. Upon conclusion of review, **MDIFW** will post any changes with responses as appropriate. MDIFW will notify partners via email when changes are posted.

The steering committee suggested that **MDIFW / MNAP** consider developing a brief "users guide" to the posted data to facilitate partner and public review.

~Regional Conservation Opportunity Areas [RCOAs] – Phillip

An effort of the North Atlantic Landscape Conservation Cooperative [NALCC] with NE Wildlife Diversity Technical Committee to identify regional "focus areas" for the conservation of NE biodiversity – the focus is the conservation of SGCN, especially regional SGCN. Regional SGCN are those for which the NE has a high regional responsibility and those species with high vulnerability in the NE. Steve Fuller, USFWS, leads the effort; the first meeting was 12/15. There are ~20 representatives across NE. Phillip, Barbara, and Andy are the Maine representatives.

Regional SGCN list based on regional responsibility and regional vulnerability (how many states in NE included it as an SGCN). Based on 2005 SGCN lists. Does not include invertebrates. Includes a high % of our 2005 SGCN. Not a regulatory program or requirement of our Action Plan.

How will RCOAs interface with Maine's focus areas? Yet to be determined.

~SGCN habitat distribution – Don Katnik

MDIFW, MNAP, DMR are reconciling the NEHTCS and the NALCC regional GIS habitat map and finalizing identification / classification of habitats and SGCN habitat associations. Necessary to accomplish this prior to mapping distribution. Mapping SGCN distribution and their habitats; what part of Maine does each SGCN inhabit; identify by towns and sub-watersheds [HUC12]. Generating maps via observational data, GAP distribution data, and looking at habitats types that biologists have associated with each SGCN and the habitat type occurrence in Maine. Randy Boone's GAP data thorough and intensive, but dated. Concern about observational data bias --> considering just geographic spread of the observations helps to reduce this. These maps are "living documents" that can / will be modified as better data becomes available.

Maine's habitat classification will be slightly out of synch with other NE states, but Maine will be able to cross-walk back to NE "standard" habitat types. NALCC has released a revised/updated habitat map; they have renamed some habitats.

Steering Committee requested that the marine habitat classification system be circulated for broader review [**DMR**]. Partners will have a chance to review distribution maps. Initial posting will consist of PDFs, but in the future, data will be accessible via an online viewer. The distribution maps are color-ramped.

Other discussion:

Compiling individual species maps into a multi-species assessment.

Build in expected changes in distribution caused by climate change - perhaps this can be accomplished as a conservation action item.

Archiving process is important to store data so changes in species distribution through time can be tracked.

~Reporting on elements 1-3 / deferred

~Next conservation partner meeting

01/20/15 at Maple Hill Farm. An email notification will go out to partners in the next day or two.

The steering committee discussed the objectives, format, and agenda for the 4th conservation partner meeting. It desired to move forward with the completion of elements 1-3 and to begin the consideration of conservation actions, element 4.

Agenda for 01/20/2015 partner meeting:

~Overview of public outreach and communication, element 8

Stakeholders, targeted surveys, focus groups, and analysis.

~Prioritization of SGCN habitats, element 2 [brief overview to prepare for breakout group discussion]

~Update on the process for identifying distribution of SGCN

~Overview of the threat assessment process and results, element 3

~Break-out groups

1] SGCN / habitat stressor assessment

2] Possibilities for habitat prioritization*

3] Public communication and outreach

~Break-out group reports

~Introduction to conservation actions, element 4**

*The committee suggested the need to run through several of the habitat prioritization options and present these for discussion in the break-out groups.

****MDIFW** should present options for organizing sub-groups to develop conservation actions, and conclude the next partner meeting with an agreed upon process.

Of particular interest was the process to be used to develop conservation actions; the committee desires to consider spend much of 01/08/2015 meeting discussing possible approaches to developing conservation actions. The committee requested that **MDIFW** prepare a menu of approaches that it could consider; and it requested that **MDIFW** prepare a list of possible conservation actions. The committee discussed the development of a guidance document to set the tone for conservation action development. The group decided that the operational charter, approved at the last committee meeting, serves that function.

The committee requested that **MDIFW** prepare an assessment / review of 2005 conservation actions to determine progress and success for previous conservation actions. It also requested that **MDIFW** prepare a summary of Maine's on-going collaborative conservation actions.

The discussion turned briefly to element 5, monitoring. This topic will receive greater consideration at subsequent steering committee meetings.

~Public Outreach: Will be addressed at the 01/20/2015 partner meeting as part of the morning plenary and as an afternoon break-out group discussion.

~Wrap-up thoughts, suggestions

Barry: was spruce budworm considered during the assessment and identification of SGCN?
MDIFW: no, but budworm should be considered a stressor when applicable. [NOTE: did MNAP consider budworm as a habitat threat? It seems to fit under the 'invasive and other problematic species' category.]

Barry asked about the possibility of setting up a public outreach display at the 01/20/15 partners meeting to inform the partners of the anticipated outbreak. [NOTE: it does not appear that the steering committee made a formal decision on Barry's request. Would the committee recommend allowing partners to set up information displays at partner meetings? If so, should we build time into the agenda for partners to explore the displays, e.g., like a poster session at a conference or provide that opportunity during the lunch break?]

Next steering committee 01/08/2015, 0900-1200, MDIFW, Augusta

**Maine Wildlife Action Plan Steering Committee
January 8, 2015
0900 - 1130
MDIFW, Augusta**

Present: Barry Burgason (MFPC), Judy Camuso (MDIFW), Phillip deMaynadier (MDIFW), Tom Doak (SWOAM), Molly Docherty (MNAP), Jeff Norment (NRCS), Amanda Shearin (MDIFW), Mark Stadler (MDIFW), Sally Stockwell (Maine Audubon), Charlie Todd (MDIFW), Barbara Vickery (TNC), and Nate Webb (MDIFW).

Bold = action item

~Welcome by Commissioner Woodcock

~Minutes of 12/16/2014 Meeting: Correct spelling of Barry's last name to Burgason. Minutes approved as noted.

~Additional members

Tribes: Sherri Venno is coordinating a meeting with Maine tribes to occur in February. Sherri will also talk with D.J. Monette, USFWS tribal liaison in the Northeast Region to discuss a process to integrate the tribes in to Maine's action plan update. She also plans to seek input from the Native American Fish and Wildlife Society. **Amanda** will stay in contact with Sherri. [Note: at the 12/16/2014 steering committee meeting Molly suggested that Maine's update should assess the contribution that tribal lands provide for the conservation of SGCN.]

DMR: MDIFW will be able to use SWG planning grant funds to provide financial support for Claire Enterline, DMR, to represent marine resources and coastal issues in the action plan update. **MDIFW** will invite Claire to also serve on the steering committee.

~Reporting on elements 1-3 / Phillip

MDIFW has posted the SGCN list, SGCN habitat associations, and stressors affecting SGCN and their habitats on the action plan website. This will provide partners and the public the opportunity to review the information. Phillip handed out examples of the draft reports for Katahdin Artic butterfly, New England Cottontail, and the alpine ecosystem macrogroup. Phillip explained that the reports – for individual SGCN and habitat macrogroups - integrate action plan elements 1-3 in a single, unique document. MDIFW is considering several mechanisms to prioritize stressors.

The committee expressed its satisfaction with the reports, and offered several recommendations to **MDIFW**.

- Provide a "users guide" with terms, definitions e.g., "actionability"
- Change "threats" to 'stressors' in the database reports
- Provide definitions of the threat characteristics
- Editorial review of the reports to ensure consistency of format and terminology
- Announce and describe the reports to the partners at the January meeting
- Send an email to partners informing them that the reports are available on the website.

~Agenda 01/20/2015 partner meeting // Maple Hill Farm, Hallowell

The steering committee discussed the objectives, format, and agenda for the 4th conservation partner meeting. The committee developed the agenda below. Each morning session will provide time for floor discussion.

9:00 Welcome

9:15 Overview of public outreach and communication, element 8
Stakeholders, targeted surveys, focus groups, and analysis.

10:15 Update on the process for identifying distribution of SGCN, element 1

10:45 Break

11:00 Overview of the threat assessment process and results, element 3

12:00 Lunch

1:00 Prioritization of SGCN habitats, element 2 [results of habitat prioritization options]

1:30 Break-out groups

Habitat prioritization: partner review and feedback

Coastal / marine

Wetlands

Freshwater / aquatics

Terrestrial

3:00 Break

3:15 Break-out group reports

3:45 Introduction to conservation actions, element 4

Options for organizing sub-committees to develop conservation actions

Process that sub-committees will use to develop conservation actions

4:15 Wrap-up thoughts, suggestions

Where are we in the process

Closing comments from the floor

Select date of next partner meeting – tentatively week of 02/09/2015

4:30 Adjourn

~Development of conservation actions, element 4 // Mark

At the December meeting, the committee asked MDIFW to prepare

1. An assessment / review of 2005 conservation actions to determine progress and success of previous conservation actions
2. A summary of Maine's on-going collaborative conservation actions
3. A list of possible conservation actions
4. A menu of approaches for the development of conservation actions that it could consider

1] Mark distributed *Maine's State Wildlife Action Plan: 10 Years of Enhanced Wildlife Conservation*, an MDIFW summary of projects accomplished with SWG funding since the award of Maine's first grant. He also provided the committee with an excerpt from Maine's 2005 action plan [Chapter 6.0, *Conservation Actions*, pages 3-11]. This document provides a summary of priority conservation actions identified in the 2005 plan. Based on the SWG summary report, Mark highlighted within Chapter 6.0 the 61 SGCN receiving conservation action.

The committee indicated that in the future **MDIFW** should develop a system to identify all work (not just funded by SWG) that addresses conservation actions. They noted that there are many things that partners accomplish that are not highlighted in the SWG program summary. **MDIFW** should also review its survey and monitoring data for each SGCN to determine which require additional effort and which do not.

2] *Maine's State Wildlife Action Plan: 10 Years of Enhanced Wildlife Conservation* provides an overview of Maine's on-going collaborative conservation actions. [Note: In the 2005 action plan Chapter 9.0, *Coordination with Conservation Partners* provides an assessment of collaborative efforts.

3] Mark distributed "Examples of Possible Conservation Actions" a document highlighting ~120 potential conservation actions developed from notes taken by MDIFW staff at various national, regional, and Maine action plan meetings.

The committee requested that **MDIFW** provide its members with a digital version of the list for their review and comment. It also requested that **MDIFW** prepare a matrix of conservation actions by broad ecosystem group [terrestrial, aquatic/freshwater, wetland, and marine coastal]. **Mark** will prepare the matrix and forward to members via email.

4] MDIFW proposed that the 2015 conservation actions be developed by ecosystem sub-committees [terrestrial, aquatic/freshwater, wetland, and marine coastal] facilitated by MDIFW staff and interested / capable partners. The committee concurred, but also requested a fifth sub-committee considering broad, big picture conservation actions.

Best Practices for State Wildlife Action Plans and the *Northeast Lexicon* provide guidance for the development of conservation actions. Mark provided the committee with a written overview of the suggestions contained in these documents. In particular he presented conservation-planning information from the *Open Standards for the Practice of Conservation* and SMART.

The committee discussed both processes at length. It concluded that the Open Standards provides a coherent way to develop conservation actions; however, there are simpler approaches that achieve essentially the same result. It suggested that the starting point for generating conservation actions should be the information developed to meet the requirements of elements 1-3. The committee requested that **MDIFW** prepare a guidance document for the development of conservation actions to be used by the five sub-committees. The document will set the parameters for the development of conservation actions.

MDIFW and interested **steering committee** members will meet to discuss facilitation of sub-committees and the development of actions. **Mark** will schedule this meeting prior to the next steering committee meeting.

~Development of monitoring protocols / *Best Practices for State Wildlife Action Plans*, 3 levels of monitoring:

- Species and habitats,
- Effectiveness of conservation actions, and
- Implementation of adaptive management as necessary.

~Updates

February conservation partner meeting: the morning of 02/12/2015; half-day meeting in the Augusta area. **MDIFW** will explore options for Skype for those who can't attend.

Online posting of WAP information

- Sub-committee minutes to be posted shortly
- SGCN habitat associations and stressor assessment has been posted; MDIFW has yet to draft the "users guide." **MDIFW** will develop by next partner meeting. Guide will facilitate partner and public review. The guide will have an introduction and it will address online navigation and definitions of terms. The committee suggested that the inclusion of screen shots would be beneficial.
- Maine habitat classification system, marine habitat associations are posted under draft documents
- **Mark** will notify partner that MDIFW has posted these materials.

Regional Conservation Opportunity Areas

Phillip, Andy Cutko, and Barbara participated in an RCOA conference call yesterday. The goal is to develop a methodology to identify RCOAs, not actually designate the RCOA polygons. The NE Landscape Conservation Cooperative will develop a lexicon on how states might develop RCOAs. It is also updating RSGCN list based on states 2015 action plan update. At this time there is little nexus with the 2015 Maine action plan.

Maine Land Conservation Conference

MDIFW awaiting notification from Maine Coast Heritage Trust

Spruce budworm display at partner meeting

Barry told the committee that his request was on-hold

~Wrap-up thoughts, suggestions

Steering committee assignments

Review list of possible conservation actions

~Next meeting: 02/05/2015. MDIFW, 0900-1130

Maine Wildlife Action Plan Steering Committee
February 5, 2015
0900 - 1230
MDIFW, Augusta

Present: Barry Burgason (MFPC), Judy Camuso (MDIFW), Phillip deMaynadier (MDIFW), Tom Doak (SWOAM), Molly Docherty (MNAP), Emily Norton (MCP), Amanda Shearin (MDIFW), Mark Stadler (MDIFW), Nate Webb (MDIFW).

Phone-in: Sally Stockwell (Maine Audubon), Angela Twitchell (BTLT), Barbara Vickery (TNC), and Jed Wright (USFWS)

Bold = action item

~Minutes of 01/08/2015 Meeting: Deferred so the committee could move directly to review and discuss *A Process for Developing Conservation Actions for Maine's 2015 SWAP* brought forward by MDIFW.

~MDIFW proposal: *A Process for Developing Conservation Actions for Maine's 2015 SWAP* (see attached)

Following the January partner meeting, MDIFW staff met to review the success and accomplishments of the meeting and to consider partner comments and suggestions. Staff concluded that it is difficult for partners to assimilate large amounts of information and then to draw from this information to review and/or develop action plan elements. MDIFW felt the most progress was made when it presented partners with a proposal for their consideration, rather than starting with a blank slate and asking partners to develop an element from the beginning. In response, MDIFW reviewed its current thinking on the process for developing conservation actions (see previous minutes). It decided to prepare a revised process and present it to the steering committee for discussion.

The committee spent two and one-half hours discussing the draft process. During the opening discussion several members voiced concern about the ability of the partners to be actively involved in the development of conservation actions under the process. Mark responded that MDIFW felt that greater progress would be made if the partners had a draft proposal for consideration than if they were asked to start with a blank slate. Several committee members also felt that a proposal for partner consideration would be the most productive. Further discussion followed. Mark asked the committee if there was "modified consensus" to proceed with preparing a list of potential conservation actions for partner consideration. All members present indicated that there was.

Barbara noted that the proposed process did not include a consideration of "big picture" conservation actions, which had been a consideration in earlier discussions. Judy said this was still included in the process and that the actions developed in steps 1A and 1B would serve as a springboard for that discussion.

The following is an outline of that proposal. Committee discussion is recorded under the applicable "steps."

Step 1A: MNAP develop list of conservation actions for habitats / DMR develop list of conservation actions for marine habitats

Jed asked about status of stressor assessment. Amanda said that MDIFW posted it for review last week, but has received little comment to date. He also asked if outside expertise in climate change should be invited to assist with developing habitat actions.

Barbara suggested that steering committee members be able to participate in step 1A, that the development of coastal conservation actions should draw from outside expertise as necessary, and that more representation from the partners should be incorporated in to the development of conservation actions. The members concurred. **Steering Committee** members will provide a list of suggested partner representatives to MDIFW by February 5th.

Molly suggested that professional facilitation of the process to develop habitat conservation actions may be appropriate.

The committee felt that preparation of conservation actions would be best accomplished if the actions were crafted around a goal, clearly articulating their purpose and intent. This led to a discussion of SMART (specific, measureable, achievable, realistic, and time-bound) planning and of *The Open Standards for the Practice of Conservation*. The committee concluded that it would be advantageous if all of the individuals preparing conservation actions were working from a common understanding of basic planning and of goals and objectives. **Barbara** has prepared a training seminar, based on the *Open Standards*, for presentation to the committee, MDIFW, MNAP, and DMR. She will provide training to individuals crafting conservation actions for both habitats and species on Thursday, February 12th from 0900 – 1200 at the Arboretum, Augusta.

Note: refer also to Step 1B below.

Step 1B: MDIFW develop list of conservation actions for priority 1 and priority 2 SGCN

Add DMR to Step 1B: MDIFW and DMR develop list of conservation actions..."

The steering committee agreed with the process outlined in 1B – that MDIFW and DMR will develop conservation actions for SGCN and bring them forward for steering committee consideration.

Emily said that they would also like to develop actions for priority 3 marine SGCN. Phillip responded that including P3 species would be a significant departure from the established procedure. Discussion followed. The committee concluded that it would be acceptable to advance "broad" conservation actions for P3 species, e.g., "necessary research."

Barbara asked what was the criteria and guidance that would be used by those assigning conservation actions to one of the three importance tiers. Phillip said the assignment would be based on the professional judgment of the individual doing the assessment and that purely biological considerations would inform the professional judgment.

Note: refer also to Step 1A above.

Step 2: MDIFW, MNAP, and DMR combine SGCN and habitat conservation actions

Combine steps 2 and 3 into a single step.

Add MNAP and DMR

Move the categorization of conservation actions from step 4, to step 2. MDIFW and the steering committee will place the actions in the appropriate categories.

Step 3: MDIFW, MNAP, DMR, and steering committee review and prioritize SGCN and habitat conservation actions

Add MNAP and DMR

Combine steps 2 and 3 into a single step.

Tom expressed concern that the step 3 deadline was too tight.

What criteria will we use to prioritize conservation actions? Discussion. **Mark** will review the *Best Management Practices for State Wildlife Actions Plans* for guidance and assemble concepts into draft for steering committee consideration.

Step 4: Conservation partners review draft conservation actions and select subset of actions for the 2015 plan [and select a subset of conservation actions to bring forward to the conservation partners]

Move the categorization of conservation actions from step 4, to step 2. MDIFW and the steering committee will place the actions in the appropriate categories.

Send conservation action proposals to partners prior to this meeting, providing them with enough time to assimilate the information.

Meeting format:

--Morning plenary:

Focus Areas

Overview of process to draft conservation actions

1A - habitats

1B - specie

Guidance to break-out groups

--Break-out groups – two separate break-our session: habitats followed by species

Habitats

- coastal / freshwater,
- terrestrial / wetlands,
- freshwater/aquatics marine/freshwater

Species

- birds,
- mammals / reptiles, amphibians, invertebrates
- inland fish and marine

Provide more time in breakouts to discuss conservation actions.

Step 5: MDIFW and steering committee prepares conservation actions for 2015 plan

Step 5: [numbering error in document] Partners review and provide comments to MDIFW list of conservation actions

Begin application of the *Open Standards* to the process earlier than step 5.

Modify 2nd sub-bullet to read "Finalize SMART goals and objectives..."

Step 6: MDIFW reviews and incorporates partner comments

Step 7: MDIFW prepares 1st draft of 2015 action plan

~MDIFW proposal: *Public Outreach Plan Moving Forward* (see attached)

Following the January partner meeting, MDIFW reviewed its outreach and public participation plan (element 8), considering comments and suggestions offered by the partners. MDIFW decided to develop a proposal modifying its plan and to present the proposal to the steering committee.

Amanda presented an overview of what each state is required to accomplish to successfully complete element 8 (*State and Tribal Wildlife Grants Program*). Next, she provided a quick comparison of efforts in 2005 and those to date for 2015. Finally, she reported on specific public outreach accomplishments in the preparation of the 2015 plan, listed in several broad categories.

- Presentations and Public/Partner Meetings
- Press Releases / Articles / Social Media / Print
- Email Correspondence
- Peer Review of elements 1-3
- Dedicated 2015 action plan website
 - Draft and final versions of action plan elements
 - Upcoming and past meeting information
 - Contact information

She told the committee that MDIFW will exceed the official requirements for element 8, and that Maine has surpassed the accomplishments attained during preparation of the 2005 plan. Given this, MDIFW proposes to adjust its future outreach and public participation efforts to the following:

- Complete public opinion survey, summer 2015
- Action plan presentations as requested or opportunities arise
- 1st draft of action plan posted on-line for 30-day public comment period
- The public outreach sub-committee will focus on outreach during implementation of the actions plan.

Amanda said that MDIFW is continues to pursue input from Maine's Native American tribes.

Judy told the committee that Sheridan Olden, a member of the Commissioner's Advisory Council, is an invited conservation partner. Judy periodically also provides the Advisory Council with updates on the status of the action plan. The 2015 action plan was also a topic during MDIFW's introduction to the Legislature at the beginning of the current session.

The steering committee supported the proposed modification to the outreach effort. It suggested that additional outreach to the executive committee of the Maine Forest Products Council was important to solicit its input. The committee asked **MDIFW** to notify partners of this change before their next meeting.

~Next conservation partner meeting

March 25-27 possible dates

Location: Augusta area

~Other items: none

~Wrap-up thoughts, suggestions: none

~Next meeting:

Monday, March 9 1300-1700

Maine Wildlife Action Plan Steering Committee
March 9, 2015
1300 - 1630
MDIFW, Augusta

Present: Barry Burgason (MFPC), Judy Camuso (MDIFW), Claire Enterline (DMR), Tim Glidden (MCHT), Amanda Shearin (MDIFW), Mark Stadler (MDIFW), Sally Stockwell (MAS), Angela Twitchell (BTLT), Nate Webb (MDIFW), Jed Wright (USFWS).

Phone-in: Phillip deMaynadier (MDIFW)

Bold = action item

~Review minutes of 02/05/2015 meeting / Approved

~Review of action items from 02/05/2015 meeting

- The committee asked MDIFW to advise partners of the revision of the outreach effort -- **MDIFW** will notify partners of this change with the email announcing the next partner meeting.
- The committee requested that MDIFW draft criteria to prioritize conservation actions for its consideration. MDIFW has prepared a draft prioritization process. Discussed later in the minutes.
- *Open Standards* training – Barbara volunteered to train agency staff and invited conservation partners in the use of the *Open Standards* to develop conservation actions. Presented later in the minutes.

~Updates for steering committee

- Friday, 03/13/2015 is the deadline for committee members to provide comments on the threats presented in SGCN, Habitat Reports.
- MDIFW will meeting with the USFWS and Maine Tribes (all tribes invited) to discuss Tribal Wildlife Grants, Maine's Wildlife Action Plan, and the North Atlantic Landscape Conservation Cooperative. The meeting is scheduled for March 26, 2015 at Indian Island. Amanda told the committee that the meeting will be similar to our earlier meeting with landowners – providing an opportunity to discuss tribal and state wildlife / fisheries programs and areas of potential collaboration. Judy advised the committee that the Attorney General said MDIFW should not engage in discussion of jurisdictional issues. Tribal grants are competitive and don't require the preparation of a wildlife action plan.

Given the amount of work that has been accomplished to date on Maine's action plan up, Sally suggested that MDIFW provide the tribes with the necessary background and information prior to the meeting. Jed suggested a brief call to the tribes might be in order to facilitate this. The committee considered the possibility that species of concern to the tribes may not be included in Maine's list of SGCN. It concluded that this was unlikely, but should it occur, there is the option of expanding Maine's SGCN list to include species that are important to the culture and heritage of the tribes. Angela asked if there were examples of this in the action plans of other states. Sally wondered what other culturally important species other groups might have.

Barbara said she would like to attend the meeting. All agreed that this would be beneficial for the committee's deliberations and would also show the committee's support for collaborative efforts between Maine and the tribes.

- *Open Standards* training - using *Open Standards* to develop conservation actions. Barbara provided a summary of the training session that she and John Morrison [WWF] provided to MDIFW and MNAP staff, several steering committee members, and a few members from the broad group of conservation partners. She and John concluded that all grasped the process quickly and were able to use it to develop a conceptual model for the training exercise. Barbara told the committee that there is continued opportunity for coaching and more intense training. Jed suggested this may be an appropriate conservation action for inclusion in the 2015 plan.
- Step 1A, *A Process for **Developing** Conservation Actions for Maine's 2015 SWAP*
Amanda and Nate provided a summary of the process and accomplishments of the freshwater / aquatic; marine / coastal; terrestrial; and wetland habitat groups in preparing conceptual models for habitats within their assigned group. The successful effort occurred during two, 1-day sessions attended and facilitated by individuals from MDIFW, MNAP, DMR, the steering committee, and conservation partners. The morning sessions were devoted to training and the afternoon sessions to break-out groups developing conceptual models. (See handouts provided, which are included.)
Claire asked whether developing the conceptual model flowcharts or the conservation actions is the highest priority. The committee concluded that developing the actions is most important, and that they should include as much detail as possible. Jed suggested that this may be a point to check back in John Morrison for ideas.
Nate presented an onscreen overview of a conceptual model developed during a habitat breakout session. The models developed during the Step1A break-out sessions are a flowchart mapping out the impact of various threats to the habitat and the strategy to eliminate or diminish that impact.
Amanda gave a summary of the completed habitats, those requiring additional work, and those yet to be started. The committee requested that **MDIFW** complete all unfinished work by the end of the week; then provide a five-day opportunity for members of the break-out groups to review the completed models; and then modify as appropriate to reflect review and provided the final conceptual models to MDIFW / RAS and DMR for consideration in their Step 1B work.
- Step 1B, *A Process for **Developing** Conservation Actions for Maine's 2015 SWAP*
Phillip provided a summary of the Step 1B process currently ongoing at MDIFW. He wondered if the conceptual models prepared to date (Step 1A) are specific enough; he concluded that likely they are not for most strategies.
MDIFW will develop conservation action proposals for species, guilds, and habitats; staff will enter these into the database. Staff will be specific in their proposals and will also consider the 2005 action plan and its level of specificity. This work is scheduled for completion on March 23, 2015.

Barbara asked when the Step 1A information would be provided to RAS/DMR. Phillip responded that this effort is ongoing and a priority, but has not occurred yet.

The Steering Committee will meet on March 27, 2015 at Maine Forest Products Council to review, discuss, prioritize, and categorize (Step 2) the conceptual models developed in Steps 1A, 1B. MDIFW and partners will use the conceptual models to develop conservation actions.

*~A Process for **Prioritizing** Conservation Actions for Maine's 2015 SWAP*

Mark introduced a draft process for prioritizing conservation actions. The proposal is a system of 1) criteria to score proposed actions and 2) based on score, assignment of the conservation action to one of four tiers. (The proposal is included with the minutes.) A lively discussion ensued. No attempt is made herein to capture the extent of this discussion, but it revolved around three significant issues: process, scoring, and the prioritization criteria. At conclusion, the committee asked **MDIFW** to develop a revised draft reflecting its comments for its further review and consideration.

~Next conservation partner meeting

Possible dates: April 15-17

Location: Augusta area

~Other items

~Wrap-up thoughts, suggestions -None

~Next meeting

Thursday, April 9, 2015, 9:00 -11:30 am, MDIFW, Augusta

Maine Wildlife Action Plan Steering Committee
April 23, 2015
0900 - 1200
SWOAM, Augusta

Present: Judy Camuso (MDIFW), Phillip deMaynadier (MDIFW), Tom Doak (SWOAM), Molly Docherty (MNAP), Claire Enterline (DMR), Emily Norton (MCP), Amanda Shearin (MDIFW), Mark Stadler (MDIFW), Charlie Todd (MDIFW), Barbara Vickery (TNC), and Nate Webb (MDIFW),

Bold = action item

~Conservation action "themes" –Amanda / Nate / Steering Committee participants in working groups

-Review and discuss the results of the work completed by:

-coastal / marine work group

-terrestrial / wetland group (the committee had begun on April 9th and asked MDIFW to complete)

-freshwater / aquatic work group

-Committee discussion of themes and which are applicable across multiple habitats

-Who (or which entities) are likely to be the key leads in undertaking a particular theme

Amanda and Nate provided the committee with handouts listing all themes identified for marine / coastal, freshwater / aquatics, and the terrestrial / wetland habitats groups; they then explained the information presented in the handouts.

The steering committee liked the concept of themes and will move forward with them within the 2015 plan. Discussion followed, largely concerning prioritization of themes and/or conservation actions.

Tom - what is the relationship of themes to SGCN? How can we prioritize without knowing the SGCN that will benefit?

Barbara - add a column to the handout with the number of P1, P2, and P3 SGCN. Amend themes to reflect that the theme is focused on SGCN.

Phillip – the prioritization process is purely biological and is linked to the number of SGCN rather than feasibility (operational, social, political, and conservation scale considerations).

Judy – prioritization might also consider management of lands in conservation ownership and opportunities to obtain federal match, etc.

Phillip - yes, but prioritization should be driven by biological need and the impact of the theme on biological need.

Claire - the marine / coastal work group had difficulty considering biological priority separately from feasibility for its themes; the group integrated biological priority with feasibility, preferring to consider them together.

Judy – prioritization should consider those themes / actions that are highly actionable and have a high likelihood of success, i.e., high feasibility

Amanda – we can add 3 columns to the handouts detailing the number of SGCN, feasibility, and the actual impact of the action.

Barbara – we need to prioritize themes or actions - how are we going to do this? Has MDIFW established a prioritization process?

Mark – no, there are differing opinions within in MDIFW regarding prioritization.

Amanda - how do we prioritize themes?

Claire - ignore priority for now; rather, consider the themes and discuss how SGCN will integrate into the theme.

Tom - do we need to prioritize themes? Shouldn't the conservation actions within themes be the target of prioritization?

Barbara - make themes as specific as possible.

Tom – again, is it necessary to prioritize themes? But rather the actions within the theme that are important to SGCN.

Phillip – (providing a summary of the discussion) **MDFIW** will add the information discussed to the tabular handouts; MDIFW and DMR will present SGCN-specific conservation actions by taxa rather than by a theme. MDIFW and DMR will consider if there are SGCN-specific actions that can be integrated into the habitat themes. He repeated that prioritization of themes or actions should be driven by their biological priority and their likely impact on the conservation target rather than by their feasibility.

Barbara –we must also consider the actions likely impact on conservation target. How does the action address the threat? What is the severity of the threat?

Prioritization could consider any of these: number of SGCN, SGCN/habitat biological priority, feasibility, and threat severity.

Amanda - sequencing of actions within themes, recognizing that some actions serve as the building blocks of a comprehensive strategy, may be an efficient prioritization process.

The committee recommended adding these themes:

- Diversification of the available non-federal match to better leverage State Wildlife Grant funds
- Ensure that the Maine SWAP is considered within other funding mechanisms, e.g., LMF, MOHF, NRCS, and that decision-makers are aware of the action plan
- Establish a SEG-funded small grants program

~Finish Step 2 for habitats and SGCN –Steering Committee

-what information will the committee forward to the conservation partners

-consider the organization, format, and presentation of the information

-discuss desired outcomes for the Step 3 partners' meeting

The committee asked **MDIFW and DMR** to develop a plan and a process for presenting the habitat and SGCN conservation actions to the partners. The committee will consider this at its next meeting, tentatively planned for May 12th.

~Considering / incorporating cultural SGCN in to Maine's list –Amanda

The tribes would like to have “culturally” significant species represented on Maine's SGCN list. Amanda provided background to the committee addressing the tribes' concern for “cultural” species; she also distributed the supporting information provided by the tribes.

After discussion, the committee concurred that the addition of tribal cultural species to the SGCN list was warranted. Phillip told the committee that this could be done by **adding another criteria to the SGCN** assessment process that would automatically recognize these species as P3 (priority 3 SGCN).

Next meeting: tentatively planned for May 12th.

The meeting adjourned at 12:30 p.m.

Maine Wildlife Action Plan Steering Committee
May 20, 2015
0900 - 1200
MNAP, Augusta

Present: Barry Burguson (MFPC), Judy Camuso (MDIFW), Phillip deMaynadier (MDIFW), Molly Docherty (MNAP), Jeff Norment (NRCS), Emily Norton (MCP), Amanda Shearin (MDIFW), Mark Stadler (MDIFW), Sally Stockwell (MAS), Charlie Todd (MDIFW), Barbara Vickery (TNC), and Nate Webb (MDIFW), Jed Wright (USFWS)

Bold = action item

Agenda: Conservation Actions and preparation for the final conservation partners meeting

~MDIFW / DMR presentation of the tabular data for 1) habitat conservation actions – categorized by theme and for 2) SGCN-specific conservation actions – categorized by taxa. Each data set includes the additional information requested by the committee.

-- Discuss content and output format for habitat conservation actions / Amanda

Amanda opened with a PowerPoint presentation explaining the content and format of the habitat related conservation actions and themes; she also provided explanatory handouts. She reviewed the habitat threat analysis, which considered specific threats at both the habitat and species level to determine the breadth and efficacy of conservation actions. The assessment considered only moderate and high threats to SGCN. She explained the information presented is not intended to be a prioritization process, but rather another way to look at the information as Tom requested.

Amanda explained the tabular information. She commented that habitat theme TW11 likely applies to all habitat groups and actions, as does the development and distribution of outreach materials. The steering committee discussed the tabular information and requested that **MDIFW** revise the table's title to reflect that the information considers only moderate- and high-level threats to SGCN. The committee considered the need to develop an additional table that addresses "super" themes -- those themes that cut across all habitat groups -- by habitat group and lead agency. Discussion followed on suggested modifications to the tables and the breakdown of the information presented, especially in regards to information concerning the numbers of P1, P2, and the total number of SGCN by habitat. Phillip suggested "rolling up" this information. The committee requested that **MDIFW** remove "supporting partners" from the table; it was concerned about offending a partner by omission. The committee suggested that an alternative may be to list *partners we hope to work with during implementation*. Landowners are a significant partner and they desire to know how they can benefit wildlife conservation. The committee suggested that the 2015 plan might outline how landowners and others could specifically participate in the action plan.

-- Discuss content and output format for SGCN actions / Nate

Nate opened with a live database presentation and explained the process for P1 and P2 threat assessment and the resulting conservation actions. He noted that, where appropriate, MDIFW used guilds for efficiency of data entry and analysis – and so, the data analysis and presentation

address either species or guilds. He said there are ~205 unique species conservation actions. MDIFW is finishing up data quality control and he anticipated that this would require several more days. Nate told the committee that the species conservation actions identified ~2 dozen regulatory actions, which were rewritten as non-regulatory actions if possible or excluded from the list of actions if not. These revisions or exclusions were in keeping with the specifications of the 2015 action plan operational charter concerning regulatory action. Nate also told the committee that MDIFW/DMR proposed not to include the specific details of survey and monitoring actions within the table (and he did not include these actions in the handout), but rather to access these via hyperlink.

The committee reviewed the species information and had asked Nate follow-up questions. In particular the committee was interested in what seemed to be inconsistencies in the information. These were addressed. Sally suggested that the tables not include the "threats addressed" column, and the committee concurred. She then asked how useful is the "category" column? Nate responded that it allowed MDIFW / DMR staff to add additional categories. The committee thought the column should remain part of the table. Molly suggested that **MDIFW** / DMR should consider ways to consolidate the tables to reduce the number of pages, and she provided several options.

Nate told the committee that a number of species actions referenced *Beginning With Habitat* and he asked the committee how this might be addressed. The committee suggested these action might be revised to reference "...*Beginning With Habitat* and other such programs. **Judy** said that she would seek guidance from Commissioner Woodcock and Jim Connolly, Director of the Bureau of Resource Management.

-- Discuss next steps for Feasibility and Biological Impact Considerations / Barbara

Barbara provided the committee members with the draft *Considerations When Prioritizing Conservation Actions for Maine's 2015 WAP*. She explained that it provided guidance and specific criteria that could be used to assess the feasibility of a particular conservation action as well as its biological impact. She said it is intended to be a set of "considerations" for use by both MDIFW and partners in assessing which conservation actions to implement during the development of the 2015 plan as well as providing criteria to review actions that come forward during its 10-year life. It is not a strict ranking protocol. The committee suggested that **MDIFW** consider including the document in the 2015 plan with an accompanying explanation. Molly suggested that the colored box and its content be deleted from the draft. Barbara replied she felt a cost-benefit analysis should remain within the draft.

-- Discuss MDIFW proposal for developing greater specificity (measurable, SMART objectives) for a small subset (~3) of high priority conservation actions

Phillip suggested that MDIFW and the committee develop SMART / Open Standards objectives for several cross-cutting themes and use these as examples for the manner in which all themes / actions would be developed as they becomes actionable. He said both partners and MDIFW would follow these examples in developing actions for implementation. The committee discussed these apparent cross-cutting themes: habitat mapping, habitat connectivity, and invasive species. Who will develop the SMART objectives for these themes?

Sally suggested that MDIFW prepare examples for a theme, guild, habitat, and species. Charlie suggested that MDIFW / DMR prepare SMART objectives for actions addressing imminent

threats to SGCN or their habitats. Barbara concurred with Charlie and added that MDIFW / DMR identify these and advise committee. Judy asked if it would be possible to develop SMART objectives after the mid-June partner meeting. Phillip said he believed it was, but that MDIFW / DMR must assemble the teams and start the process now. It was pointed out that before this can begin MDIFW /DMR must first select its priorities, possibly from those discussed. The committee suggested that MDIFW / DMR consider imminent threats, a habitat, and a theme. As an alternative to the previous discussion, Phillip suggested that **MDIFW** review several of the approved action plans to assess how other states have considered conservation actions goals and objectives and to also review the formal requirements for preparing action plans. The committee concurred with his suggestion.

~Final partners meeting (mid-June) /Mark

Mark reviewed the proposed format and objectives for the final partner meeting in mid-June. It will follow the pattern of previous meetings with a morning plenary session followed by afternoon breakout groups. During the afternoon breakout sessions, addressing identified conservation actions for habitats and species, the partners would have the opportunity to review the full list of actions and 1) identify any actions missed, 2) revise existing actions as necessary, and 3) identify partnerships that will bolster action implementation and success.

The committee suggested that the partners should also consider those over-arching implementation actions necessary to move the 2015 plan forward, and that MDIFW should provide partners with a brief overview of the public comment period for the draft plan. **MDIFW** agreed and will add these to the agenda. The committee discussed other additions to the agenda: partner review and concurrence with the conservation action feasibility considerations; partner input on how they would like the information in the action plan presented for accessibility and ease of use; and partner input on how they could remain involved in the action plan during its implementation, and the possibility of having a one-year-out meeting.

Adjourn 12:30

Appendix 2 Operational Charter

**2015 Maine Wildlife Action Plan
Conservation Partners / Steering Committee / Subcommittees**

**Operational Charter
October 2015**

1. Introduction

Congress instituted the State Wildlife Grant (SWG) program in 2001, which provides wildlife conservation funds to the 50 states. States use these to develop and implement management programs that benefit wildlife and their habitat, including species that are not hunted or fished. Since inception of the SWG program, Maine has received close to \$8 million in SWG funding and accomplished over 50 research, management, and conservation projects. To receive SWG funding, Maine must have a comprehensive wildlife conservation strategy, now commonly known as a state wildlife action plan (the plan). The U.S. Fish and Wildlife Service (USFWS) approved Maine's first plan in 2005. The plan identified species and habitats in greatest conservation need, significant threats to wildlife and habitat, and the conservation actions required to prevent endangered species listing and to spur the recovery of endangered species. <http://www.maine.gov/ifw/wildlife/reports/wap.html>

The SWG program requires that Maine update its plan by October 2015 and forward it to the USFWS for review and approval. The plan must be developed by the Maine Department of Inland Fisheries and Wildlife (MDIFW) in collaboration with Maine citizens and wildlife conservation partners. Partners are private landowners, federal and state agencies, Native American tribes, non-governmental organizations, and academicians that have a role in the conservation of Maine's wildlife and habitat. MDIFW invited 73 partners to participate. Over the next 12 months, partners will collaboratively develop Maine's 2015 plan. MDIFW and partners will also solicit and consider advice and recommendations from the public. Following plan approval by the USFWS, MDIFW and partners together will implement the plan.

2. Statement of Purpose: Maine's Wildlife Action Plan

Maine's plan embodies the shared vision of MDIFW, its conservation partners, and the public. It is Maine's blueprint for achieving our common goal of conserving healthy wildlife populations. The plan

- articulates clear conservation goals and defines the actions required to best conserve species at risk, manage habitats, prevent the listing of rare and imperiled species, and keep common species common,
- outlines strategies to perpetuate regional and state biodiversity,
- provides opportunities for partners to lead in its implementation,
- adapts to changing environmental conditions affecting fish, wildlife, and habitat, and

- establishes efficient and effective stewardship of Maine's natural heritage that is responsive to the public trust and to private landowner rights.

3. Guiding Principles

As it develops the 2015 plan, the partners will ensure that the plan

- is built on a foundation of sound scientific principles and is feasible,
- recognizes that the public has a genuine stake in the plan -- wildlife belongs to the public and is held in the public trust,
- is developed in an open, transparent, and inclusive process that encourages and facilitates the involvement of all partners,
- respects property rights and recognizes that landowner participation is critical for the successful development and implementation of the plan,
- provides opportunities for conservation actions by multiple partners and partnerships across the state,
- develops and implements conservation actions that are voluntary, based on incentives rather than constraints,
- does not rely solely on land acquisition, but also incorporates conservation actions on private land,
- identifies opportunities for conservation and management of landscapes, watersheds, and habitats that address the needs of multiple species, wherever possible, especially in light of climate change, and
- prioritizes actions for implementation by species and habitat.

4. Operational Guidance for Conservation Partners, Including the Steering Committee (5.2) and Subcommittees (5.3)

Meetings: MDIFW recognizes that travel expenses impinge upon the budgets of state, federal, tribal, and non-governmental organizations. It will keep the number of meetings to the minimum required to develop an approvable plan.

Partners will be notified of meeting dates at least 30 days in advance.

MDIFW will post all documents distributed at partner meetings or by email or as follow-up to partner meetings on the action plan website.

<http://www.maine.gov/ifw/wildlife/reports/MWAP2015.html>

Timelines: Partners have the responsibility to move the process forward. MDIFW and partners will establish timelines to ensure completion of the plan on time. Each will adhere to established timelines for submittal of requested materials and information and for the completion of assigned tasks.

Mutual Respect and Trust: the strength of the partners is their diverse knowledge and experience. Partners will base their work upon collective contributions and expect others to abide by the following

- encourage participation by all partners,
- avoid hidden agendas and to be open about potential conflicts of interests,
- ensure all partners are respected and treated fairly, respect all contributions and ideas, and direct critiques at the idea not the person,
- avoid speaking while others are speaking, avoid side-bar conversations, wait until there is an appropriate time to provide your comment,
- keep to the topic,
- avoid creating distractions, and
- place cell phones on silent mode, if receiving a call, minimize disruption to the group.

Decision-making: Unanimous consensus is the goal, but not a requirement.

Partners represent the diverse interests of their agencies and organizations. It may be possible that all do not fully agree on specific aspects of the update. MDIFW and partners will strive to be open-minded and creative. As differences arise, partners will listen to other views and rationale. Partners will make decisions based on the general "modified consensus" of those present (i.e., if a partner disagrees with the rest of the group, he can nevertheless "live with" the decision and will not oppose the decision or stand in the way of moving it forward.)

MDIFW will resolve all decisions that do not receive this minimal level of support and will provide a written explanation for its decision to the partners. MDIFW will post the explanation on the action plan website; the explanation will note the degree of consensus reached by partners before the decision was handed to MDIFW for resolution.

Decisions reached by conservation partners are advisory and represent recommendations to MDIFW. If MDIFW decides not to accept a recommendation from the conservation partners, it will provide a written explanation for its decision and post the explanation on the action plan website.

Concurrence: Partners agree to participate as specified in this charter.

Travel Expenses: Partners are responsible for their travel expenses.

Partner funding: Participation will not provide an advantage in securing SWG funds.

Copyrighted or Restricted Material: All such material must be acknowledged and properly referenced.

Acknowledgement: The 2015 plan will acknowledge and recognize the contributions of participating partners and their organizations.

5. Process Structure

5.1. Conservation partners

Conservation partners will develop the 2015 action plan in collaboration with MDIFW and Maine citizens.

MDIFW invited 73 partners to participate in the development of the 2015 action plan. Partners are private landowners, federal and state agencies, Native American tribes, non-governmental organizations, and academicians that have a role in the conservation of Maine's wildlife and habitat.

5.2. Steering Committee

The steering committee (committee) will guide the development of the action plan. MDIFW assembled a steering committee from the ranks of the conservation partners. Membership was by invitation. Committee members are broadly representative of key conservation partners. The committee may recommend additional members, but their participation must be approved by MDIFW. The committee is limited to no more than fifteen members.

MDIFW recognize that members have obligations to their agency or organization. MDIFW will strive to minimize members' time commitment; however, it is expected that those who agree to participate will endeavor to attend meetings. The committee may meet either in person or by conference call.

5.2.1. Steering Committee Function

The steering committee

- serves as the initial sounding board for MDIFW on both overall process and initial plan components and drafts,
- provides feedback to MDIFW between partner meetings on time-sensitive issues involving the plan update,
- establishes the timeline for the plan update and ensures that the timeline is met, and
- ensures that the process follows the charter's statement of purpose (2.) and guiding principles (3.).

Members present during committee meetings or conference calls are encouraged to participate fully. Not all members may be able to attend and participate in all discussions. As decisions are made or conclusions reached, those not present agree to move forward as a team and not to retrace discussions or decisions.

Members will strive to attend conservation partner meetings.

The committee may designate and establish subcommittees.

The committee may ask partners or its members to develop new materials, provide existing resources, gather information, or complete tasks necessary to the update. The committee will

schedule dates when tasks are to be completed by consent of the members present. Members will share tasks and responsibilities by

- volunteering for tasks, especially those for which they have special expertise or interests,
- providing information that can fill data gaps and advance ideas, and
- keeping current with the update, even if unable to attend all discussions.

5.3. Subcommittees

The committee may designate and establish subcommittees.

Prior to the formation of the steering committee, MDIFW established a Public Communications and Outreach Committee and MDIFW / Maine Natural Areas Program established a Focus Area Review Committee. Both are now considered subcommittees functioning under the guidance of the steering committee.

The committee will designate individuals to chair each subcommittee. Subcommittees must be chaired by a partner or MDIFW, but subcommittee members may be from outside the participating partners.

Subcommittee chairs report to the committee. Chairs will ensure that steering committee members receive information about the activities of their subcommittee, such as minutes and copies of pertinent correspondence.

Subcommittee chairs are responsible for coordinating their meetings and conference calls. Subcommittees dissolve when they have accomplished their designated purpose.

6. Evaluation

To be successful, the steering committee and partners must complete the plan update, accomplishing the requirements and objectives specified by the USFWS, prior to October 2015. It is important that committee members and partners are committed to success. The committee must ensure that the plan update remains on schedule and meets deadlines.

Previous sections of the charter guide the deliberations of partners and the committee, and therefore, provide a basis to gauge success. The committee will evaluate periodically the progress of the action plan update and adherence to the requirements of the charter. The committee will conduct the evaluation by a method that it deems appropriate. The committee will use the following attributes to evaluate success.

Participation: MDIFW staff, partners, and committee members are engaged in the plan update; they volunteer to assist with tasks, especially those for which they have special expertise or interest; they are proactive in providing information that fills data gaps and advances ideas; and they keep current with the planning process, even if they are unable to participate in all discussions.

Schedules: MDIFW staff, partners, and committee members develop new materials, provide existing resources, gather information, or complete other necessary tasks as requested and scheduled.

Outreach: Partners and committee members engage the members of their organizations in the plan update, using their outreach mechanisms to inform their members and to solicit comment. MDIFW provides regular updates to the steering committee and partners and provides opportunities for broad participation by other organizations and citizens.

Subcommittees: Subcommittee chairs conduct meetings and accomplish assigned tasks as scheduled, report to the committee, and ensure that the committee is fully informed of its activities.

Appendix 3. Agendas – Conservation Partner Meetings
In Preparation.