MAINE DEPARTMENT OF INLAND FISHERIES AND WILDLIFE

Roland D. Martin, Commissioner

Wildlife Division

Research & Management Report

2010

Table of Contents

DID YOU KNOW...

the Wildlife Division has an active land acquisition program? Over the decades, the Division has acquired 100,000 acres in 62 areas dedicated to wildlife habitat conservation and management. These lands are known as Wildlife Management Areas. They are also available to the public for the more "rustic" types of outdoor recreation. [See also http://www.maine.gov/ifw/wildlife/management/wma/index.htm]

During the last two years, the Division purchased 1,800 acres associated with these Wildlife Management Areas:

Cobscook Bay WMA: 93 Acres acquired in fee (2009), 105 acres acquired in fee (2010)
Ducktrap WMA: 21 acres acquired in fee in 2008 and 2009
Garcelon WMA: 13 acres acquired in fee (2008) 118 acres acquired in fee (2009)
Kennebec Estuary WMA: acquired in fee - 38 acres in 2008, 38 acres in 2010;
Merrymeeting Bay WMA: acquired in fee – 248 acres in 2008, 105 acres in 2009, 134 acres in 2010
Morgan Meadow WMA: 37 acres acquired in fee (2010)
Plymouth Bog WMA: 704 acres acquired in fee (2010)
R. Waldo Tyler WMA: 74 acres acquired in fee (2008)
Ruffingham Meadow WMA: 56 acres acquired in fee (2008)
Scarborough Marsh WMA: 53 acres acquired in fee (2008)

The Division achieved these acquisitions with almost 5 million dollars in grants.

Currently MDIFW is working on eight additional projects (5,352 acres) anticipated to close in 2010:

305 acre fee acquisition in Argyle;
214 acres of fee acquisition for Morgan Meadow WMA;
52 acre fee acquisition for Killick Pond WMA;
109 acre fee acquisition for Vernon S. Walker WMA;
873 acre fee acquisition for Caribou Bog WMA;
1,240 acre fee acquisition in 2 parcels as part of the mitigation package for the Maine Power Reliability Project
2,400 acre fee acquisition for Mattawamkeag River WMA in partnership with MDOT
159 acre Conservation Easement in partnership with The Nature Conservancy.

In addition to land acquisition, the Division has been working on other wildlife conservation projects. Throughout the following pages you will read about them. I believe we can all be proud of Maine's state-of the-art, scientific wildlife management programs, which are formulated with public participation.

I thank you for your interest, support, and participation in the conservation of Maine's wildlife. Here's to informative, and I trust, enjoyable reading!

--G. Mark Stadler
Director, Wildlife Division

These studies are financed in part through Federal Aid in Wildlife Restoration Funds under Projects 81D, 82R, and 83C, and through the Endangered Species Conservation Act.

The Department of Inland Fisheries and Wildlife receives Federal funds from the U.S. Department of the Interior. Accordingly, all Department programs and activities must be operated free from discrimination in regard to race, color, national origin, age or handicap. Any person who believes that he or she has been discriminated against should write to The Office of Equal Opportunity, U.S. Department of the Interior, Washington, D.C.

FUNDING MAINE'S WILDLIFE PROGRAMS

Funding for wildlife management comes from many different sources. Most of our work with game animals and furbearers, many of the salaries, and most of the administrative costs of the Wildlife Division, are funded by hunting license revenues, which are matched by federal Pittman-Robertson Funds (based on an 11% excise tax on sporting arms, ammunition, and archery equipment, and a 10% excise tax on handguns).

Funding for other species comes from a variety of sources. In addition to State Wildlife Grants, a recent Federal program based on Maine's Wildlife Action Plan http://www.maine.gov/ifw/wildlife/groups_programs/comprehensive_strategy/index.htm, a large portion of the funds also comes from the sale of hunting licenses and permits. Other sources of money include "Section 6" funds from the US Fish and Wildlife Service for the recovery of threatened and endangered species, the Oil Spill Conveyance Fund, contributions to the **Nongame and Endangered Wildlife Fund** ("Chickadee Check-off"), and purchases of **Conservation License (Loon) Plates**. Some of these funds are used as match to obtain federal funds.

Some people are unaware of the contribution hunters and trappers make toward the conservation of rare, threatened, and endangered wildlife. Also, you may be surprised to know that many of the financial supporters of the endangered species program are also sportsmen who are committed to the conservation of all Maine's wildlife. **Wildlife belongs to all of the people of the state**, and sportsmen's dollars can't be expected to do it all.

Stable funding to address wildlife programs is desperately needed. Contributions to the Chickadee Check-off, Conservation Registration plates (Loon Plates), and the Maine Outdoor Heritage Fund provide the core "State" funding for Maine's nongame and endangered species programs; however, the many conservation needs exceed the funds contributed…and contributions are declining (Table 1). All money donated, whether through the Chickadee Check-off, Conservation License (Loon) Plates, grants, or direct gifts, are deposited into the Maine Endangered and Nongame Wildlife Fund - a special, interest-bearing account from which money can only be spent for the conservation of Maine's nongame wildlife, includes rare, threatened or endangered species.

Given our limited financial resources, Maine can be proud of the accomplishments made for nongame and endangered wildlife in the last 20 years. We thank those of you who buy a Loon Plate, participate in the Chickadee Check-off, or purchase a Maine Outdoor Heritage Fund lottery ticket. Your voluntary support and generosity deserves a special "thank you." **We are all working hard to keep Maine a special place.** Take pride in your accomplishments - and please, as you fill out your tax return next year or register your car, join with us again in conserving Maine's wildlife diversity!

Table 1. A history of income derived from the "Chickadee Check-off," Loon Plate, and Maine Outdoor Heritage Fund to benefit nongame and endangered wildlife programs.

	Chickadee Check-off				Loon License Plate		Maine Outdoor Heritage Fund	
Year	Total Given	Number of Givers	Average Donation	Percent of Taxpayers Giving	Income to MDIFW	Number of Registrations	Income to MDIFW	Number of Projects Funded
1984	$115,794	25,322	$4.57	5.3%				
1985	$129,122	29,200	$4.42	6.0%				
1986	$112,319	26,904	$4.17	5.4%				
1987	$114,353	26,554	$4.31	5.2%				
1988	$103,682	24,972	$4.15	4.8%				
1989	$93,803	20,322	$4.62	3.6%				
1990	$88,078	18,332	$4.80	3.2%				
1991	$92,632	19,247	$4.81	3.4%				
1992	$95,533	18,423	$5.18	3.2%				
1993	$82,842	15,943	$5.20	2.8%				
1994	$84,676	10,863	$7.79	2.0%	$335,042	59,829		
1995	$81,775	10,014	$8.17	1.8%	$457,307	81,662		
1996	$90,939	11,024	$8.25	2.0%	$535,679	95,657	$112,232	3
1997	$77,511	8,686	$8.92	1.5%	$588,364	105,065	$133,971	5
1998	$48,189	4,065	$11.85	0.7%	$617,484	110,265	$184,109	7
1999	$47,908	3,775	$12.69	0.7%	$569,610	101,716	$121,436	5
2000	$44,496	3,297	$13.50	0.6%	$499,486	89,194	$323,884	11
2001	$49,348	3,713	$13.29	0.6%	$458,057	81,796	$148,408	5
2002	$50,412	3,661	$13.77	0.6%	$446,342	79,704	$172,191	8
2003	$55,348	3,792	$14.60	0.6%	$425,147	75,919	$184,129	5
2004	$43,158	3,234	$13.35	0.6%	$402,695	69,615	$234,126	10
2005	$36,769	2,931	$12.54	0.5%	$381,948	67,814	$154,656	7
2006	$36,865	2,924	$12.60	0.5%	$367,791	65,677	$116,121	6
2007	$37,209	2,852	$13.04	0.5%	$355,180	63,425	$141,526	6
2008	$34,929	2,757	$12.67	0.4%	$333,536	59,560	$141,059	7
2009	$33,751	2,688	$12.56		$316,148	56,455	$56,128	3

Our most pressing need is a stable and adequate source of funding for all of our programs. The Association of Fish & Wildlife Agencies evaluating the Department and the Wildlife Division recognized this need in a report. In 2001, the Citizens' Advisory Committee identified several possible sources of funding – here are a few of those ideas to consider:

- That the Constitution of Maine be amended to require that at least 1/8 of one percent of the State Sales Tax be dedicated to fish and wildlife conservation programs to be distributed to the various state agencies that administer those programs.
- That the share of state gas tax revenues distributed to state agencies for operation of boating, ATV and snowmobile and related programs should be at least equal to the portion of the gas tax revenues generated by watercraft and recreational vehicle gas sales.
- That every 4 years hunting and fishing license fees should be reviewed by the Legislature and adjusted as appropriate to reflect the cost of providing hunting and fishing-related services.
- That the Maine Income Tax return be revised to restore the Chickadee Check-off to the main part of the tax form.

What do you think about these ideas? Your support to establish a stable funding source to continue the work of the Wildlife Division is appreciated.

--Richard L. Dressler
Supervisor, Wildlife Resource Assessment Section

There's something wild lurking on your tax return!

MAINE·ENDANGERED·AND·NONGAME·WILDLIFE·FUND·

Give a gift to wildlife this year - put a check with the chickadee!

Next time you are in your local super market or convenience store, please buy an

OUTDOOR HERITAGE FUND LOTTERY TICKET!!

WILDLIFE HABITAT PROTECTION AND CONSERVATION

Habitat Conservation and Special Projects

Landowner Incentive Program

Private landowners are integral to the conservation of our wildlife heritage and natural resources and are often committed in principle to stewardship of endangered or threatened species, but the lack of financial and technical incentives has limited the scale of long-term conservation.

The Landowner Incentive Program (LIP) is a competitive grant program to support collaborative efforts to partner with private landowners to cultivate and fund conservation opportunities for critical habitats in the state. Since its inception in 2004, Maine has received more than $3 million for longterm habitat protection of rare and endangered species. Unfortunately, the program was short-lived (in 2008 Congress eliminated the LIP program from the budget); yet Maine continues to use its remaining LIP funds to bolster efforts to recover at-risk species occurring on private lands.

Habitat Protection in Species-at-Risk Focus Areas

Southern and coastal Maine has the highest level of plant and wildlife species diversity in the state including the highest numbers of populations of rare plant and animal species. Unfortunately, this area is one of the most desirable for development, and increasing development is leading to habitat fragmentation and loss. Within this area the State of Maine has been working to identify at risk plant and animal populations and the habitats they need to remain viable. The result of this effort is a mapped suite of species-at-risk focus areas. These areas include assemblages of the best examples of rare species populations and high quality natural habitats in Maine. LIP funds are being used to acquire conservation easements to preserve viable populations of rare plant and animal populations within species-at-risk focus areas. Significant time was spent on previously funded easement projects, four of which closed during this period

Highland Farm Conservation Easement, Town of York, York County

Since 1992, a group of ten local, state, and federal conservation organizations have worked together as the Mt. Agamenticus to the Sea Conservation Initiative (MtA2C) with the goal of rapidly expanding the amount of conservation land in this biologically critical part of Maine. The Highland Farm project was the number one conservation priority for MtA2C and the Town of York because of its rich biological diversity; connectivity to the York River and Mt. Agamenticus region; drinking water resources for Kittery and surrounding towns; and critical habitat for the Maine endangered New England cottontail, the special concern swamp darter, and the globally rare ringed boghunter dragonfly (State threatened).

Lower Sheepscot River – Weary Tract, Town of Newcastle, Lincoln County

LIP funds were used to assist the Saco Valley Land Trust in the purchase of a conservation easement that conserves 210 acres of forest land and approximately 6,856 feet of shoreline on the Sheepscot River in Newcastle and provides important habitat for spongy arrow-head, mudwort, horned pondweed, and pygmyweed all listed as Species of Concern in Maine. Two Bald Eagle nests are located downstream on the river, and eagles are commonly seen in the area. Additionally, the Sheepscot River is one of only eight rivers in Maine with remnant populations of genetically distinct wild Atlantic salmon.

Biddeford/Kennebunkport Vernal Pool Complex – Cranberry Marsh North, Town of Biddeford, York County

LIP funds were used to purchase a conservation easement on a 170-acre parcel of land consisting of upland forest and forested wetlands within the Biddeford-Kennebunkport Vernal Pool Complex Focus Area. This was one of several unprotected properties in a block of more than 500 undeveloped acres and is home to a population of spotted turtles (State Threatened). Wetlands, scattered within a matrix of upland forest, may also support Blanding's turtles (State Endangered), ringed boghaunter dragonflies (State Threatened), ribbon snakes (Special Concern), and possibly black racers (State Endangered).

Merrymeeting Bay - Browne's Point, Kelly Farm, Bowdoinham, Sagadahoc County

This project permanently protects high value tidal freshwater marshes, riparian habitat and associated upland buffer on Brown's Point in Bowdoinham. It includes approximately 4,000 feet of undeveloped shoreline on Brown's Point and abuts the area of the bay that is classified by MDIFW as a game sanctuary. There is an active bald eagle nest on the property. The intent of this project is to protect the significant wildlife habitat and to allow continued compatible organic agricultural use.

Several other projects are in various stages of completion and are expected to close during the next year:

Unity Wetlands - Scholz-Phelps / Albion Bread and Bakery Farm, Town of Albion, Kennebec County

Situated near the western boundary of the Unity Wetlands Focus Area, the Scholz-Phelps property is comprised of 230

acres of mixed woods, grassland and cropland along 15 Mile Stream in Albion, which provides habitat for 2 rare mussels, the yellow lamp mussel and the tidewater mucket (both State Threatened). Wild leek and a silver maple floodplain forest, a rare natural community, have been mapped on adjacent land and observed on the subject parcel. Improving and protecting wildlife habitat and water quality are landowner priorities as is a secondary interest in using a portion of the property for sustainable agricultural production.

Upper Saco River – Russell Tract, Town of Fryeburg, Oxford County
The Pleasant Pond Floodplain Forest Conservation Easement will prevent development of a 558-acre area of privately-owned forest floodplain habitat while keeping the land in responsible forest management and allow recreational uses. The floodplain portion of the property contains 90% of the state's best sites for the globally rare Long's bulrush. These open fens are surrounded by a broad buffer of protective silver maple floodplain forest, itself a rare natural community in the state. Additionally, four species of rare dragonflies are associated with the floodplain ecosystem on nearby sites, and rapids clubtail has been recorded on the site.

Upper Saco River - Moose Pond Brook, Denmark and Hiram, Oxford County
The 1,700-acre Moose Pond Brook project occurs within a large undeveloped block of 9,125 acres and is one of the few areas along the Saco River where an opportunity exists to maintain a large tract of unbroken upland forest abutting a major river and forest floodplain network. Securing conservation of the Moose Pond Brook project will link approximately 2,200 acres of significant upland and outstanding forest floodplain habitat, including nearly 3 miles of shoreline along the Saco River shoreline and over 2 miles shoreline on both Moose Pond and Dragon Meadow Brooks.

Kennebunk Plains/Wells Barren, - Wells Barren, Town of Wells, York County
LIP funds will be used to support a management endowment for 367 acres of land owned by The Nature Conservancy (TNC) in Wells, Maine. Habitat management for the Plains includes an intensive regime of prescribed burning to maintain the numerous fire-dependent species and associated natural communities. In addition to supporting the world's largest population of the flowering plant northern blazing star the Plains provides habitat for two other rare plants, the toothed white-topped aster and upright bindweed found at only a handful of sites in Maine. The property contains some of the best examples of three rare natural community types: pitch pine-scrub oak barrens, red maple alluvial swamp, and sandplain grasslands. The Plains is also one of the last strongholds in the northeast for a variety of grassland birds, including the grasshopper sparrow (State Endangered), vesper sparrow and upland sandpiper (State Threatened) and provides habitat for the northern black racer snake (State Endangered).

Central Parsonsfield – Pine River Forest, Town of Parsonsfield, York County
LIP funding will allow the Maine Department of Conservation to acquire a conservation easement on a key forested 71-acre parcel located in Central Parsonsfield. The property includes a population of the threatened small whorled-pogonia and is surrounded on all sides by the Leavitt Plantation easement (8,368 acres) held by the Maine Department of Conservation – the largest conservation area within the Central Parsonsfield Focus Area and the Pine River Matrix Forest. Protection of this property will prevent development and habitat fragmentation within this important easement. It will also prevent other human-related threats including introduction of invasive species, soil erosion, and water quality impacts.

Upper Saco River – Norkin Tract, Denmark, Oxford County
LIP funds are being used to purchase a conservation easement on 73 acres of land containing 1,000 feet of shoreline on Pleasant Pond and 4,500 feet on Black Brook Bog located in the Saco River watershed. Norkin-Pleasant Pond is part of a watershed which supports a rich and unique ecosystem comprised of silver maple dominated floodplain forest, vernal pools, oxbow ponds, acidic fens, backwater sloughs, grassy swales, outwash plain pond shores, and several lakes and ponds all supporting a diverse array of flora and fauna. This property abuts several other conservation areas as well.

Conserving Priority Shorebird Nesting, Feeding, and Roosting Areas

Pleasant Bay - Long Creek Point, Addison, Washington County

This project permanently protects Long Creek Point, a 60.6 acre parcel in Long Cove on the east side of Pleasant Bay that includes 11.8 acres of forested upland, 49.5 acres of associated estuarine intertidal salt marsh and mudflats, and 1,954 feet of fringing salt marsh and coastal mudflats that are identified by MDIFW as High Value Feeding and Roosting Shorebird Habitat and High Value Tidal Waterfowl and Wading Bird Habitat. Additionally, the expansive intertidal wetlands that dominate Long Cove have been identified as one of the Top Twenty Shorebird Areas in the state.

For more information on Maine's Landowner Incentive Program go to http://www.mainenaturalareas.org/docs/lip/.

--Sandy Ritchie
Habitat Conservation and Special Projects Wildlife Biologist

Beginning with Habitat: Is it Making a Difference?

Is the town-by-town approach Beginning with Habitat takes making any difference? Since joining the Department in 2006, I have been involved with the coordinated review of nearly 80 town comprehensive plans with regional biologists. We have drafted and subsequently submitted comments regarding a variety of local wildlife and fisheries issues to the State Planning Office (SPO). Each set of comments concludes with our finding the plan as incomplete (the plan does not reflect the known significant features within town boundaries), inconsistent (the plan suggests strategies in conflict with Department priorities), or consistent. We review each plan in the context of Department goals as outlined by the State Wildlife Action Plan. These goals include: guiding growth in a manner that minimizes conflicts with known significant habitats; conserving rural acreage necessary for keeping common species common; and encouraging the development of public access opportunities to support outdoor recreation.

In 2007 MDIFW worked closely with the SPO Land Use Team (a process facilitated by SPO's membership on the Beginning with Habitat Steering Committee) to revise the Growth Management Act comprehensive plan rules to explicitly require the consideration of Beginning with Habitat features in the development of local comprehensive plans. These changes helped to solidify requirements for local natural resource inventory narratives, provided towns with a checklist with specific analysis questions to prompt close examination of how critical natural resource issues are addressed locally, and set clear guidelines for the development of a future land use plan. This latter component is the heart of the local comprehensive planning process as it sets the stage for where future growth takes place, and where conservation efforts will be focused.

Perhaps the greatest benefit of the rule change is that it helps to reinforce to towns what the Department has been messaging through its Beginning with Habitat program since 2001: *strategic habitat conservation has many benefits well-beyond plants and animals*. By weaving habitat and public access related issues into a variety of required comprehensive plan topic areas including: Transportation, Recreation, Marine Resources, Water Resources, Agriculture & Forestry, Climate Change, and Regional Coordination, the new Growth Management Act requirements have provided the Department with a great opportunity to showcase our services and further promote the value of the resources that the public relies on us to protect.

So, has the rule changed anything on the ground? Local planning is a slow and deliberate process. Local comprehensive plan committees often take several years just to draft a plan, and then the political process involved in adopting a plan can add another year. Through the comprehensive plan review process, MDIFW hopes to piece together the foundation that will support broad implementation of State Wildlife Action Plan goals and objectives. As more and more towns adopt plans with the modest goals of completing an open space plan, appointing a conservation commission, or simply utilizing Beginning with Habitat maps during planning board reviews we are making progress. Since the rule change we have seen a definite uptick in towns recommending strategies to conserve rural forest blocks through land acquisition and subdivision design. References to Focus Areas of Statewide Ecological Significance, significant vernal pools, and the need to maintain aquatic habitat connectivity are increasing. The Beginning with Habitat program is receiving more and more requests for targeted technical assistance to support comprehensive plan implementation.

Although the incremental pace of these changes could be taken as insignificant in this era of instant messaging and the worldwide web, the Beginning with Habitat program has always been about influencing an underlying societal change that meshes interests in growth and development with an awareness that strategic conservation buoys prospects for future prosperity. With each local champion that we inspire by reaching out to local comprehensive planning committees, we are building local partnerships vital in conserving a Maine landscape that will benefit generations to come.

--Steve Walker
Beginning with Habitat Program Coordinator

Wildlife Habitat Group

The Wildlife Habitat Group creates, maintains, and distributes spatial information about wildlife and their habitats. This data is used by MDIFW staff and by other agencies and organizations for conducting environmental reviews, research, and landscaping planning. The Habitat Group consists of:

Dr. Donald Katnik, Habitat Group Leader - Supervises Group activities and coordinates habitat-related projects with other Division and Department staff and other State and Federal agencies.

Dr. MaryEllen Wickett, Wildlife Biologist and Programmer/Analyst - Develops computer applications to facilitate access to habitat data by IF&W staff and other users. Provides technical support and habitat data analyses for landscape planning efforts and development of species habitat models.

Amy Meehan, Wildlife Biologist and GIS Specialist - Collects wildlife habitat data from Regional Wildlife Biologists and others. Creates and maintains computer databases. Conducts field inventories of wildlife habitat and provides GIS support for a variety of projects.

Jordan Bailey, Oil Spill Biologist - Coordinates oil spill response planning efforts for the Division, including sensitive area identification and wildlife rehabilitation plan design and implementation.

Jason Czapiga, Cartographer - Supports Beginning with Habitat program by generating maps, creating and maintaining GIS data, and assembling packages of habitat information.

Vacant, Wildlife Biologist and GIS Specialist - Develops, maintains, and analyzes databases of wildlife observations and habitat. Provides assistance to other Division biologists to assess species habitats on a statewide basis.

Wildlife Habitat Programs

Wetland Revisions for NRPA and Shoreland Zoning

Coastal wetland, mudflats, eelgrass beds, and mussel bars provide habitat for tidal waterfowl and wading birds. These Significant Wildlife Habitats are defined and protected under Maine's Natural Resources Protection Act. Coastal wetlands also may be designated as Resource Protection areas for Municipal Shoreland Zoning. The current mapping of these habitats is based on outdated National Wetlands Inventory (NWI) and Coastal Marine Geologic Environments data. We are beginning a project to remap these habitats using new, low-tide imagery.

Development Mapping Update

The Beginning with Habitat program (http://www.beginningwithhabitat.org) received a $250,000 grant from EPA in May 2007 to map development in organized towns. We are mapping development for two time periods (2004, 2007), allowing municipal planners to see how changes in local ordinances and zoning have affected recent patterns of development. Imagery for a third time period (2009) is now available from the USDA National Agricultural Imagery Program (NAIP). The EPA grant is set to expire in June 1010 and work completed through then will be made available via Beginning with Habitat, but Habitat Group staff will continue capturing development data for the 2009 map.

Endangered, Threatened, and Special Concern Species

Our Endangered, Threatened, or Special Concern (ETSC) species database continues to grow as Habitat Group staff work closely with WRAS species specialists to map habitats around documented observations of these species. In addition to "mining" old field notes for more detailed information on where species were observed (previous databases had limited capacity for representing spatial information), we are merging other databases into ETSC and expanding our capabilities for mapping habitat. Initially ETSC allowed species specialists to map "primary" and "secondary" habitats. We are now working to include additional habitat types based on their ecological functions, such as "feeding," "nesting," and "travel" habitats. This greater detail will allow MDIFW to make more refined recommendations on permit reviews and better prioritization of habitat for conservation and landscape planning.

Oiled Wildlife Response in Maine

What does the Oil Spill Wildlife Biologist do?

The MDIFW Oil Spill Wildlife Biologist has four primary job responsibilities; planning for a spill, responding to a spill, rehabilitating oiled wildlife during and after a spill, and coordinating with other state and federal trustees to assess damages to natural resources. Planning for oil spills includes updating state, regional, and international contingency plans and participating in drills. It also entails ensuring that all MDIFW staff are trained in First Aid/CPR, hazardous materials

and the Incident Command System (ICS) used during emergency responses. Many oil spills occur every year in Maine. MDIFW responds when oiled wildlife have been observed or when the potential for wildlife to become oiled exists, such as when sensitive wildlife habitats are oiled. Trained biologists respond with all the equipment needed to ensure their safety (protective suits, gloves, and boots) and to capture and transport oiled wildlife (nets, traps, and pet carriers). Maine has a contract with International Bird Rescue Research Center (www.IBRRC.org) to assist with any response that exceeds our local capacity to rehabilitate oiled wildlife. Local wildlife rehabilitators are critical to responding to smaller spills and would work with IBRRC during larger spills. The National Resource Damage Assessment (NRDA) process allows MDIFW to work with the other state natural resource trustees (Department of Environmental Protection, Department of Conservation, and Department of Marine Resources), and federal trustees (U.S. Fish and Wildlife Service and National Oceanographic and Atmospheric Administration) to determine how funds paid by the Responsible Party (the spiller) will be used to mitigate damages. Examples include restoration and research projects or purchasing conservation lands.

Spill of National Significance 2010 and the Deepwater Horizon Spill

To test our readiness to respond to a catastrophic oil spill in Maine, MDIFW participated in the Spill of National Significance (SONS) drill hosted by the U.S. Coast Guard in March 2010. A spill attains "national significance" when the response needed exceeds local capacities. SONS 2010 simulated a spill of 4 million gallons of crude oil off the coast of Maine. It involved over 400 responders from multiple federal and state agencies and covered a broad range of issues that would occur during a real spill such as oiled wildlife and public relations. MDIFW, along with the U.S. Fish and Wildlife Service and many others, helped design SONS 2010 and we were pleased with the outcome of our efforts. Just one month after SONS 2010, the Deepwater Horizon spill began in the Gulf of Mexico. It has been declared a Spill of National Significance. Many of the people who participated in the SONS 2010 drill have been deployed to the Gulf of Mexico to assist, including some State of Maine employees. The Deepwater Horizon spill makes clear why we need to continue planning and practicing for oil spills in Maine's waters. For more information on the Deepwater Horizon oil spill response, visit www.deepwaterhorizonresponse.com. Click on the Current Ops tab to find the Fish and Wildlife Reports tallying oiled wildlife recovered to date.

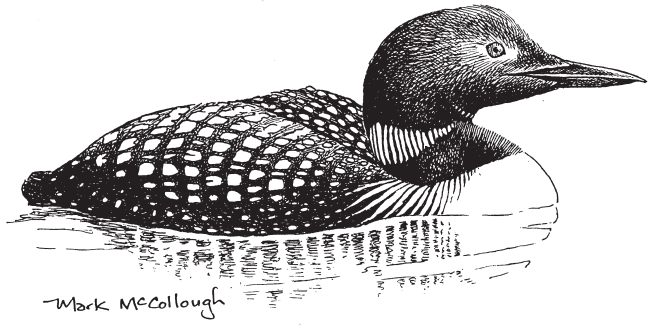
Oiled Wildlife Volunteer Network- VOLUNTEERS NEEDED!

Volunteers are a critical component of an oil spill involving wildlife. People will be needed to help wash oiled wildlife, answer phones, do laundry, and other supportive tasks. MDIFW annually updates our volunteer list and notifies these active volunteers of upcoming trainings. If you are interested in being added to our mailing list, please contact our Oil Spill Biologist at:

MDIFW Oil Spill Program
Maine Department of Inland Fisheries and Wildlife
650 State Street
Bangor, ME 04401
207-941-4455

Note: MDIFW's Oil Spill program is funded by the Inland and Coastal Surface Oil Spill Clean Up Fund, which is a dedicated fund maintained by a per-barrel fee assessed on all petroleum products entering the state. This fund is administered by the Maine Department of Environmental Protection.

--Donald Katnik



Wildlife Management Section

The regional wildlife management staff of biologists is best described as the Wildlife Division's wildlife generalists or the "jack of all trades". The seventeen wildlife biologists who staff the Department's seven regional field offices constitute the majority of the Regional Wildlife Management Section (WMS). Their breadth of knowledge, activities, and job responsibilities range far and wide - often requiring the regional staff to juggle numerous public requests, inquiries, and wildlife management projects at the same time. In essence, the regional wildlife biologist represents the Department in a multitude of public participation arenas and serves as the "state's wildlife expert" within their assigned regional geographic area. They are responsible for implementing the Wildlife Division's management program within those regions.

After reading the WMS overview, you'll probably agree that wildlife management work covers a wide spectrum of possibilities. However, much of what we do relates to managing or conserving specific habitat types and features. Since each specie of wildlife has specific habitat requirements that can differ seasonally we must ensure the proper balance and distribution of habitat types across the landscape if we are to maintain healthy wildlife populations. The Department addresses this issue every day using a variety of tools. However, I thought it might be useful to share some examples that every landowner and homeowner could consider benefiting wildlife.

--John Pratte
Wildlife Management Section Supervisor

REGIONAL WILDLIFE MANAGEMENT

Habitat Management

When managing wildlife on your land, first ask yourself what *you* want on your property in terms of wildlife and other uses. Do you want to manage for a few wildlife species, or do you want to manage for as many species as possible? Always keep in mind that you will be managing the habitat not the wildlife species themselves. It's always a good idea to start your planning by making a list of goals for your habitat and place them in order of priority. This will enable you to provide suitable habitat for wildlife while you create a landscape to meet your personal needs.

Let's Start With Back Yard Plantings

Any backyard, large or small, can be made into an excellent wildlife area for the enjoyment of the owners and their visitors. In creating such an area you first need to keep in mind the needs of wildlife. All living things need food, water, cover and space to survive. Food supplies energy and nutrients while each wildlife species has its own nutritional needs, which change from one season to another. Water is essential to all forms of life. If you have a seep or waterway on your property, managing it for the needs of wildlife is important. Cover in the form of trees, shrubs, grasses, and flowering plants provide shelter, as do nonliving objects like rock piles, brush piles, cavities in trees, and birdhouses. Wildlife use cover to protect them from the weather, to hide from predators, to establish their living quarters, and to raise and rear their young. The space or home range, is the area occupied by an animal when if performs its daily functions and travels to cover, food, and water and is often defended as a territory. The amount of space needed for a territory varies with the species, the quality of habitat, and time of year.

When choosing plants for your yard, consider their function and appearance in relation to the wildlife species you want to manage for. Determine if the plants will be providing food, or shelter or just adding to the diversity. There may be limits to what can be planted due to the size of the area or the cost, so choose plants that serve more than one function. Diversifying your habitat will promote a healthy landscape and attract the greatest number of wildlife species. The presence of many plant species makes it less likely that insects or disease will cause severe problems. Having many species of trees, shrubs, perennial and annual flowers and grasses in your yard will also attract more varied wildlife (Table 2). A variety of plants provide a wide range of food and cover that are available throughout the year.

It is important to think about wildlife needs during each season and especially here in Maine during the winter months when resident wildlife species face some of their most difficult times. The longer the period when flowers, seeds and fruits are available, the better it is for wildlife. Fall, winter, and early spring are critical to the survival of resident and migrating species, while summer foods are important for reproduction when energy needs of wildlife are very high. Cover is very important whether for nesting sites, shelter from weather, escape from predators, or for roosting. Conifers (softwood trees), cavity trees, and brush/rock piles provide winter cover. Cover not only has benefits for wildlife but also has benefits to the landowner depending on arrangement and position. Planting conifers to break the prevailing winds, can directly

save on home energy costs, while on the protected side of the windbreak, the landowners can also place feeders, and wildlife shrub plantings. These wildlife shrub plantings offer wildlife access to mast, berries and fruit and are very important where snow often covers many foods in late fall and early winter during a very critical time period for wildlife. Along side these windbreaks, planting food plots consisting of a herbaceous seed mix also offers considerable food benefit to deer, bear, turkey, hare, and grouse during late fall and early spring.

Table 2. Partial list of common native wildlife shrub plantings and trees for food and cover. All will grow in Zones 3, 4 or 5.

Highbush Cranberry (*Viburnum trilobum)*	Sargent Crabapple *(Malus sargenti)*
Winterberry (*Ilex verticillata)*	Bristly Locust *(Robinia fertilis)*
Highbush Blueberry (Vaccinium corymbosum)	Serviceberry *(Amelanchier)*
Mountain Ash (*Sorbus americana)*	Bayberry *(Myrica pensylvanica)*
Silky Dogwood (*Cornus amomum)*	Nannyberry *(Viburnum lentago)*
Hawthorn *(Crataegus)*	Elderberry *(Sambucus canadensis)*

--Richard Hoppe
Regional Wildlife Biologist

Den Trees and Snags

The Wildlife Division of IFW is responsible for management and maintenance of over 100,000 acres throughout the State. Most of this acreage is aggregated into Wildlife Management Areas (WMA) actively managed to promote, provide and enhance wildlife habitat and to provide hunting, fishing and trapping opportunities. Detailed plans developed through a multidisciplinary approach are used to reach certain goals specific to each WMA, but two general habitat features that are managed for ubiquitously on public property are den trees and snags. I'd like to take some time discussing these because they are measures that any landowner can take to enhance the habitat value of their property.

Den trees are important for many birds, mammals and reptiles throughout the year for cover, nesting and protection from the weather. Den trees are characterized as live cull trees at least 18" in diameter with existing natural cavities created by decay, wildlife excavation (i.e. woodpeckers), or mechanical wounds. Because den trees are alive, they are more persistent than snags, which will be discussed later. In most woodlots and forestland throughout the state, den trees are not overly abundant and retention and recruitment of den trees on a property is sure to be utilized by wildlife species. Where encountered in a riparian area, all den trees should be retained, if possible, and a minimum of one per acre on upland areas is a balanced objective. Because den trees are live, recruitment of future den trees should be planned for as well. Certain trees with existing defects or cavities may be identified and managed to provide future needs for den trees, a factor which is especially in the intensive management practices in today's forests. Three to five potential den trees will ensure adequate numbers in the future condition of the stand.

Another special habitat feature that is important to many species of plants, invertebrates, birds and mammals are snags. Snags are any dead or dying tree, with the optimum size at least four inches in diameter and six feet high. Larger diameter snags are generally more beneficial because they can be used by both large and small wildlife species. Larger diameter snags also take longer to decay and fall than smaller snags, which lengthens the period of usefulness for wildlife. Snags are important for wildlife because they provide a growing medium for fungi, mosses and lichens, provide shelter for invertebrates, nesting, roosting and feeding sites for birds, and mammals will use snags as denning sites, escape cover, or forage possibilities. When conducting management activities, all snags that are not safety or fire hazards should be retained. Retaining clumps of trees for snags has the added benefit of meeting safety requirements because those clumps of trees can be more easily avoided than snags that are spaced evenly throughout the stand. Another benefit of snag retention during management activities is that after they fall, they will continue to provide valuable habitat for a variety of wildlife species, from drumming sites for grouse, to a nice, safe home for mice, insects, or salamanders.

Retention and recruitment of snags and den trees are two small examples of how management of forestland with an eye on wildlife habitat can benefit many wildlife species. These habitat features are easily taken into account during planning and management activities and can provide a valuable habitat feature on the landscape.

--Ryan Robicheau
Lands Management Biologist

Herbaceous Openings for Wildlife

Managed and maintained herbaceous openings are a valuable source of both forage and habitat that benefits a wide variety of wildlife and oftentimes can compliment forest management activities. Creating and seeding these openings can be strictly for the benefit of wildlife or can be accomplished to address potential erosion issues; seeding log landings,

winter roads, water bars, water diversion ditches, stream crossings, and other disturbed sites when closing out a timber harvest.

Before planting, determine your goals; do you want to seed strictly for erosion control which will require little or no future management, or in the case of larger openings and fields, do you want low maintenance plants that will last several years or do you want to replant annually? Another factor to consider is wildlife values; you can plant a seed mix that will benefit a wide variety of species or as with food plots for example, planting specifically to benefit a particular species.

For erosion control measures, deertongue and the fescue varieties are a good choice and are included in most roadside mixes commonly available. They are well rooted, aggressive growing, and form a dense cover. They are of little value to wildlife, however by adding a variety of clovers (an annual or winter rye, or birdsfoot trefoil for example), the mix can then provide some benefit to wildlife in addition to their main function of erosion control.

Wildlife will benefit greatly from legumes and ryegrass varieties. Legumes can be classified as a 'warm season' legume that do the majority of growing during the heat of the summer months, or 'cool season' legumes which grow most during the spring and fall. They are also annual or perennial depending on the variety. Clover varieties are primarily 'cool season' varieties and include white, red, and ladino types. These are only a few examples of the many plants that are available in various conservation mixes. Other varieties to keep in mind include; Kentucky bluegrass, orchardgrass, and timothy.

Species of wildlife that can benefit from herbaceous openings run the gamut from insects to our largest mammals. For example, deer and bear utilize both grasses and clovers for food, smaller mammals and songbirds benefit from both food and nesting cover. Upland game birds including turkeys, grouse, and woodcock use the openings or nearby edge habitat for nesting, brood rearing, and feeding. In addition, woodcock also use these openings for nighttime roosting and courtship displays. Herbaceous openings and fields adjacent to deer wintering areas are of particular importance in the early spring when deer are in search of higher protein food sources.

Recommended Herbaceous Seeding Mixes
Quantities are pounds per acre. Asterisks are legumes which should be inoculated.

Mix #1: The preferred mix for most situations since it will produce good sod resistant to invasion by woody vegetation on a variety of soils under various light conditions. These grasses will provide green forage in early spring and late fall.

6# Orchardgrass, 6# Kentucky Bluegrass, 6# Tall Fescue, 1# Ladino Clover*, 10# Birdsfoot Trefoil*, and 10# Annual or Winter Rye

Mix #2: An erosion control mix supplemented to improve its wildlife value. Caution! This mix contains creeping red fescue, which has minimal wildlife value and can dominate other grasses in sunny locations. It will provide good results in most situations; is easy to obtain and can be kept on hand for quick spot applications.

40-60# Conservation mix or Agway's roadside mix, 1# Ladino Clover*, 10# Birdsfoot Trefoil*, and 10# Annual or Winter Rye

Mix #3: Recommended for sites where no fertilizer can or will be used.

10# Deer Tongue and 10# Birdsfoot Trefoil*

Mix #4: Use this mix in shady areas only as this combination will dominate other grasses in sunny locations.

20# Creeping Red Fescue and 10# Birdsfoot Trefoil*

Mix #5: This mix can be used in rough areas such as hummocks stump piles or rocky or erosion prone sites on the edges of log landings seeded to other species, but use it sparingly. Five pounds on the edge of a one acre clearing is sufficient.

Use equal amounts of Crownvetch* and Flatpea*

Openings can be the reclaiming of a field that is growing back to early successional habitat, or are forest openings within managed woodlots. These forest openings can be created from one (+) acre patch cuts, log landings, or old wood and haul roads. Seeded roads can continue to be used for both timber management and recreation. Size of openings is important as they must be large enough to allow adequate sunlight to reach the ground to stimulate plant growth. If the

openings are more linear in shape, they should be 50-100 feet wide and created in a north-south direction to allow the most opportunity for sunlight. Several openings are more beneficial and should be distributed throughout the woodlot if the opportunity presents itself. This provides greater access for wildlife and management flexibility for the landowner.

Site preparation is an important factor that will help determine the success of your seeding effort. Initially, newly created sites should be cleared of rocks, stumps, and other debris. Soil tests are also beneficial especially if managing for larger openings or fields, and of less importance for example when just seeding areas to address erosion control concerns. For these larger openings, liming and fertilizing should be considered and spread at recommended rates. This can be accomplished by frost seeding late winter/early spring or worked into the soil with a disk or drag preferably before seeding. Depending on soil conditions, additional liming may need to be done every 5-7 years, and additional fertilizing can be done 2-3 years after planting and then every 5-10 years.

Maintaining these sites over time can best be accomplished by mowing. This can be accomplished annually or perhaps every 3-5 years to keep woody vegetation down. Mowing will also encourage succulent new growth and increase insect production which is an important source of protein for both songbirds and game birds, particularly young of the year. MDIFW recommends mowing after mid to late July which will allow for ground nesting birds to complete their nesting cycle. It will also allow for new growth to be available to wildlife right up until it is covered by deep snows. If there are several open areas to maintain, varying mowing schedules is another option to create different successional stages and provide for greater habitat diversity that will also benefit wildlife.

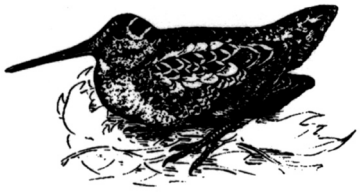
--Mark A. Caron
Regional Wildlife Biologist

Woodcock, Grouse, and Early Successional Habitat

The Department's wildlife management practices include keeping a portion of the landscape under its management in an early successional stage. Roughly twenty percent of Wildlife Management Areas (WMA's) is slated to be maintained in a range of younger age classes. Most of this acreage is managed as either field or young forest, and is expressly provided for numerous species of wildlife, including ruffed grouse, woodcock, grassland nesting birds, and a myriad of other game and non-game wildlife.

For example, the management plan for the Page Farm Compartment of the Mattawamkeag River System WMA calls for a patchwork of early successional grouse blocks, woodcock feeding strips, field reclamation and field maintenance. Creation of this management plan considered several factors:

- Wildlife species trends and population levels relative to goals;
- Site conditions;
- Early successional nature of the reverting farmland within this WMA;
- Habitat requirements for grouse and woodcock (nesting, brood rearing, singing grounds, and feeding sites);
- Increased opportunities for hunting; and
- Financial viability of implementation.



After careful consideration, we decided to manage habitat for American woodcock as a featured species while maximizing the habitat potential for other species that utilize similar habitat conditions. These operations will provide necessary habitat conditions for all life stages of woodcock and grouse, including nesting, brood rearing, singing grounds, and feeding sites.

The patchwork of habitat being managed and/or created are:

- Clearings for singing grounds – these can be seeded landings, roadways, skid trail intersections, fields, feeding strips or other openings in the forest and can be <1 acre in size;
- Brood rearing cover – sapling size hardwoods;
- Nesting cover – pole size hardwoods
- Feeding cover – dense stands of alders or young hardwoods on moist soils.

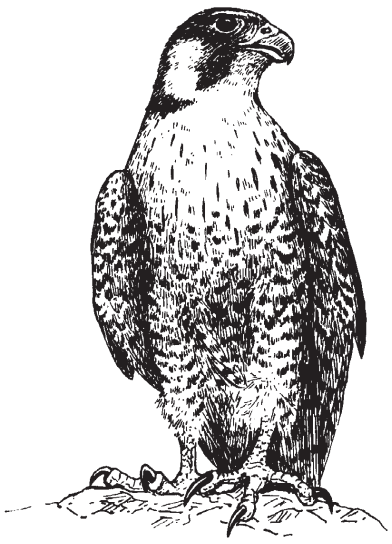
We choose to manage feeding cover with 100' wide strips of varying length dependent upon site conditions maintained on a 5 year cutting cycle, and 25 year rotation. Nesting and brood rearing habitat will be perpetuated by managing 5 acre blocks of intolerant hardwood and fir sites on a 10 year cutting cycle and 40 year rotation. These blocks will promote the best sprouting and sapling conditions possible by harvesting during the winter months when maximum nutrients are stored in the root systems and is available to provide the best possible sprouting.

--Ryan Robicheau
Lands Management Biologist

SPECIES PLANNING AND MANAGEMENT

Wildlife Species Planning and Management

Implementing successful wildlife management begins with a well thought-out plan. To develop the plan, the Wildlife Division has developed a comprehensive species planning process. The major components of the process are: a **species assessment** that summarizes what we know about a particular species or group of species; input from a **public working group** to develop species management goals and objectives; and finally, a **species management system** that lays out a path to achieving the goals and objectives. Maine's species planning process is a "state of the art" approach to integrating public participation into our decision-making process. The following is a summary of the species planning efforts over the past year.



Species planning efforts have slowed down due to other demands on the biologists' time, however, we continued to make progress. Jennifer Vashon is putting the finishing touches on the Canada Lynx Assessment; when completed, it will undergo review by Department staff and other experts before a public working group develops management goals and objectives for lynx. Wally Jakubas is close to completing the American Marten Assessment. Freshwater mussels management goals and objectives and the Upland Sandpiper and Grasshopper Sparrow goals and objectives, are awaiting approval by the Advisory Council.

During the coming year, we plan on completing species assessments for American marten, black tern, fisher, Canada lynx, peregrine falcon, Blanding's and spotted turtles, and ringed boghaunter. We also plan on convening public working groups to develop management goals and objectives for American marten, fisher, Canada lynx, peregrine falcon, and ringed boghaunter; and species specialists are planning to develop management systems for the American black bear, freshwater mussels, grasshopper sparrow, upland sandpiper, red-necked phalarope, bald eagle, golden eagle, snowshoe hare, and ringed boghaunter.

If you are interested in reviewing the Wildlife Division's species planning documents, please visit our website at HTTP://WWW.MAINE.GOV/IFW/WILDLIFE/SPECIES/PLANS/INDEX.HTM

Endangered and Threatened Species Conservation

Perhaps the most challenging area of wildlife management is recovery of Endangered and Threatened species. The Wildlife Division staff has invested considerable effort in identifying species at risk and developing plans to recover these species to the point they can be delisted. You can find specifics of what the Wildlife Division is accomplishing for Endangered and Threatened wildlife in subsequent sections of this report.

Since European settlement, at least 14 species of wildlife have been extirpated from Maine. To prevent further losses, the Maine Endangered Species Act was enacted in 1975. In 1986, Maine's first list of 23 Endangered and Threatened species was adopted. After MDIFW reviewed the status of many of Maine's wildlife species in the mid-1990s, the Legislature added 20 new species to the list in 1997. The most recent revision of the list occurred on May 24, 2007. Changes included 14 new listings, 1 delisting, a change of status from Endangered to Threatened for 1 listed species, and adding the qualifier "breeding population only" to 2 species already listed as Endangered. To obtain a PDF version of what was proposed to the Legislature and eventually enacted, go to http://mainegov-images.informe.org/ifw/wildlife/species/pdfs/etlist_recommendations.pdf

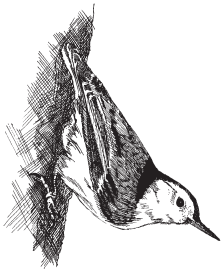
During the 2009 Legislative Session, the Legislature approved removal of the Bald Eagle from Maine's list of Endangered and Threatened species. Governor Baldacci signed the removal into law during a special ceremony on May 26, 2009. The law will become effective in September 2009. You can review the Department's rationale for recommending delisting the Bald Eagle at http://www.maine.gov/ifw/wildlife/species/endangered_species/baldeagle_delisting.htm

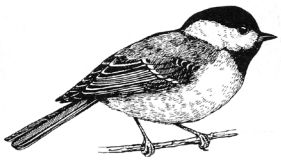
PLEASE NOTE that there is a separate list for state Endangered and Threatened marine species. The Maine Legislature has given The Maine Department of Marine Resources responsibility for maintaining and updating that list. http://janus.state.me.us/legis/statutes/12/title12sec6975.html

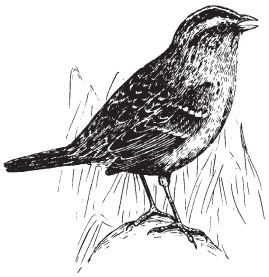
--George J. Matula, Jr.
E&T Species Coordinator & Wildlife Planner

Bird Group

The breadth of the Bird Group's programmatic responsibilities involve stewardship of 223 bird species that nest in Maine, and many more that migrate through or winter in Maine. Several of Maine's birds occur statewide, but others occur only in portions of the state. Maine has a very diverse landscape and consequently a myriad of habitats suitable for various bird species. At least 29 inland breeding species of birds reach the northern limits of their breeding distribution in Maine, 28 species the southern limits, and 2 species their eastern limits. In addition, many of Maine's island-nesting seabirds reach their southern breeding terminus on Maine's islands, like Atlantic puffins and razorbills. The peregrine falcon and wild turkey have been reintroduced in Maine. The peregrine population is slowly increasing, and the wild turkey has expanded into areas beyond our expectations. Other species, such as the turkey vulture, blue-winged warbler, evening grosbeak, American oystercatcher, sandhill crane and several species of wading birds, have expanded their breeding range into Maine at various times over the past century. Bird conservation, management, and research in Maine is both very challenging but very rewarding.







Brad Allen, Bird Group Leader – Oversees group activities and budgets and currently is conducting a common eider survival study. Brad coordinates Department interests in most seabird research and management activities as well.

Danielle D'Auria, Wildlife Biologist – Danielle is the Department's species expert on marshbirds, wading birds, common loons, and black terns. Over the past year she has also devoted a great deal of effort to heron surveys and coordination of a volunteer heron monitoring program. Her other field related duties include marsh bird surveys and research, black tern surveys, and bald eagle surveys.

Thomas Hodgman, Wildlife Biologist - Develops and implements programs and surveys to assess the status of songbirds in Maine and coordinates several priority bird research programs. Tom's recent focus is working with a graduate student studying saltmarsh sharp-tailed sparrows and monitoring grassland birds. Tom routinely provides technical assistance and advice to the Wildlife Management Section regarding bird migration and the ever-expanding windpower development.

Kelsey Sullivan, Wildlife Biologist – Kelsey coordinates waterfowl banding programs, surveys, and research to assess the status of game bird populations in Maine. Game bird species that Kelsey is responsible for include ruffed grouse, American woodcock, wild turkeys, several species of ducks, and Canada geese. He is Maine's representative on the Atlantic Flyway Council Technical Section.

Charlie Todd, Wildlife Biologist – Charlie has devoted nearly 30 years of his professional career to the recovery of bald eagles in Maine, culminating in delisting last year. Charlie also leads MDIFW's peregrine falcon recovery program. Charlie's experience makes him a valuable advisor to other staff on all Endangered and Threatened bird species issues.

Lindsay Tudor, Wildlife Biologist - Coordinates the Department's Migratory Shorebird Program with current emphasis on shorebird habitat protection under the Natural Resources Protection Act and piping plover and least tern management. Lindsay's research involves the ecology of purple sandpipers wintering in Maine and her primary survey responsibilities include all species of shorebirds and harlequin ducks.

The Bird Group would like to thank the following dedicated biologists who have assisted us with our bird conservation and management tasks over the last year: Robby Lambert, Steve Agius, Scott Hall, Maine Warden Service pilots: Charlie Later, Dan Dufault, and Daryl Gordon, Brian Smith, John Drury, Glen Mittelhauser, Dave Hiltz, Greg Runge, Chris West, Don McDougal, Jim Dyer, Bill Hanson, Chris DeSorbo, Wing Goodale, Lucas Savoy, Bruce Connery, Lesley Rowse, Joe Wiley, Margo Knight, Don Mairs, Bill Sheehan, Ron Joseph, Patrick Keenan, Bill Johnson, Cheryl Daigle, Diane Winn, Marc Payne, Maine Audubon, Linda Welch, Don Reimer, Scott Kenniston, Dick Hutchinson, Libby Mojica, Lesley Rowse, Aubrie Russell, John Sewell, several Heron Observation Network volunteers and MDIFW regional staff.

Bird Conservation and Management

Colonial Wading Bird Census and Heron Observation Network

2nd Year for the Heron Observation Network

The Heron Observation Network, or HERON for short, is a group of volunteers who have adopted wading bird colonies across the state. Adoption includes the commitment to check on a colony at least once during the breeding season (May-July) to determine if the colony is active (i.e. being used by herons, egrets, or ibises) and the approximate number of active and inactive nests. Volunteers who have more time to contribute may visit a colony every couple of weeks in an effort to gauge the productivity of the colony (number of birds fledged per nesting pair) and a timeline for each of the nesting stages (incubation, nestling, and fledgling). Only colonies that can be viewed from a distance that does not cause disturbance to the nesting birds are monitored by volunteers during the breeding season. In 2009 – HERON's first year – 47 volunteers adopted 68 wading bird colonies. In 2010, those numbers have grown to at least 58 volunteers monitoring over 76 colonies! Most of these colonies are occupied by great blue herons, a Species of Special Concern due to apparent population decline along the coast and possibly statewide. Other species that may nest in such colonies include black-crowned night-heron (State Threatened), snowy egret, glossy ibis, great egret, little blue heron, cattle egret, and tricolored heron.

Since the conclusion of the 2009 aerial and ground survey effort, 13 new colonies have been reported, and most of those are active this year. There are likely more colonies to be discovered. If you know of a wading bird colony, please don't hesitate to report it. Or, if you'd like to join the Heron Observation Network and adopt a colony yourself, please contact Danielle D'Auria, danielle.dauria@maine.gov, 941-4478.

For more information on HERON, and Maine's colonial wading birds, visit http://maineheron.wordpress.com/.

This work is supported by funds from State Wildlife Grants as well as revenues from the Loon Conservation Plate and the Inland and Coastal Surface Oil Spill Cleanup Fund.

--Danielle D'Auria

Grassland Bird Surveys

From 1997 to 1998, the Department surveyed 261 grasslands and barrens to document the presence of grassland birds, many of which are rare, Threatened, or Endangered. This effort was funded in part by a generous contribution from the Maine Outdoor Heritage Fund. Overall, this survey yielded important information on the abundance and distribution of several rare bird species in Maine, but must be viewed as only a first step towards conservation of this group of birds. Also, despite the importance of the data collected, many of the sites were sampled at minimal intensity (only 1 or 2 points among large field complexes) and should be considered a preliminary inventory of Maine's grassland bird resource. Further, agricultural fields and barrens are dynamic due to changes in commodity markets and crop rotation. Therefore, many areas identified as "important" nearly 10 years ago may no longer provide habitat for grassland birds.

To further support conservation of these species through management, environmental review, and landscape conservation, during 2007-2009, MDIFW staff from the Bird and Habitat Groups conducted additional grassland bird surveys. Our primary objectives of the project included:

1) Expand previous survey efforts by conducting additional point counts within previously visited sites and by surveying additional candidate sites;
2) Resurvey previously visited grasslands, document grassland bird use and management practices at each site, and map extent of grassland bird habitat;
3) Document trends in use of sites by rare grassland birds;
4) Assess patterns of land use change at important grassland sites.

We surveyed 729 points total across 409 sites from early May through mid July, 2007–09. We revisited 176 of the 206 sites that were surveyed in 1997-98 plus 233 new sites that had not been surveyed previously. We distributed points among 16 counties, although most points (n = 215; 29.5%) and sites (n = 69; 16.9%) were located in Washington County. Kennebec, Hancock, and Aroostook Counties were the next most intensively surveyed with between 64 and 70 points total.

The most abundant obligate species encountered during our surveys was bobolink. We tallied 1,544 individuals at 256 sites (384 points had at least 1 bobolink). Savannah sparrow was the next most abundant species with 1,030 individuals, but was more widespread, occurring at 321 sites (525 pts). Notable but less common species included vesper sparrow (209 individuals; 70 sites), eastern meadowlark (134 individuals; 78 sites), and upland sandpiper (61 individuals; 20 sites). The least abundant species was horned lark with 1 individual detected. No grasshopper sparrows were detected. The most abundant facultative species included: red-winged blackbird (489 individuals; 106 sites), tree swallow (359 individuals; 121 sites), and barn swallow (280 individuals; 107 sites).

Our overall species richness varied by county. Kennebec County afforded the greatest richness at 2.02 species per point followed by Androscoggin and Cumberland Counties with 1.98 and 1.93 species per point, respectively. Despite an abundance of grasslands, Aroostook and Washington Counties have the least diverse grassland bird communities at 1.18 and 1.40 species per point largely because some species' ranges do not extend that far north and east. For obligate grassland birds, the trends were similar with higher richness in central and southern counties and lower richness in the east, north and west. Richness at the site scale followed a similar pattern with central and southern counties having the greatest richness and northern and eastern counties the lowest.

Based on Landsat data, patches of grassland became more numerous, but smaller between 1995 and 2001. The number of patches increased from 409,229 to 446,824 but the percent of patches larger than 5 acres decreased from 6% to only 2%. In 2001, <1% of all grassland patches were >25 acres. After excluding patches smaller than 5 acres, however, the distribution of all other patches by size class was very similar between years even though the number of them (across all larger size classes) declined. We observed grassland birds disproportionately in larger habitat patches. Selection for habitat patches by size was similar between surveys. Nearly 85% of all occupied patches were >50 acres, whereas only 15.4% of occupied patches were <50 acres. A majority of bird observations (50.1%) occurred in 101-500 acre patches.

Data have been incorporated into Beginning with Habitat to facilitate landscape scale conservation of Maine's grassland bird populations. We anticipate more detailed analyses in the coming year including comparisons between previous efforts and the current survey.

This work is supported by funds from the Maine Outdoor Heritage Fund, State Wildlife Grants as well as state revenues from the Loon Conservation Plate and Chickadee Checkoff Funds.

--Thomas P. Hodgman

Migratory Game Birds

Maine contributes to several programs that assist the U.S. Fish and Wildlife Service in assessing migratory game bird populations and harvests. To assess populations, several surveys are conducted throughout the year that target specific migratory bird species groups such as sea ducks and dabbling ducks. Following each migratory bird season, harvest is measured using 1) Harvest Information Program (HIP) with data on harvest numbers, active hunters and days afield, 2) the Wing-Collection Survey where hunters contribute wings of harvested birds and serves as a measure of productivity (or recruitment) and 3) analysis of band recoveries from bands placed on Maine birds just prior to the fall hunting season.

American Woodcock

Nationally, American woodcock management is divided into two units, east and west of the Appalachian Mountain Chain. These are known as the Eastern and Central Management Units or EMU and CMU. Maine is one of the most important states for breeding woodcock and woodcock harvest within the Eastern Management Unit (EMU).

Each year, beginning in 1968, a coordinated survey called the Singing Ground Survey (SGS) is conducted across all woodcock states. Each survey participant records the number of singing male woodcock they hear in the spring on specific routes distributed throughout Maine and their breeding range. 42 routes were run in Maine in 2010 by IFW staff, USFWS staff and a number of cooperators. The long term trend (1968 to 2010) has shown a decline in American woodcock numbers across their range; however 2010 is the seventh year in a row that the EMU population appears stable. In 2010, the number of males heard on Maine's SGS routes (3.38) was slightly higher than last year (3.26) and above the 10 year average of 3.32. Habitat loss appears to be the biggest factor contributing to the overall population decline, while hunting American woodcock does not appear to have a significant influence on the population.

Hunting Season October 1, 2009 to October 31, 2009

Based on data using the Harvest Information Program (HIP), 3,100 woodcock hunters harvested 8,300 woodcock in Maine. This is down substantially from an estimated harvest level of 18,800 woodcock in 2008. The decrease in harvest is likely attributable to the timing of the hunting season and the fall flight. The typical charge of fall flight birds came well after the end of the pre-set season. It is difficult to predict 3 months in advance when the fall flight will occur, but typically woodcock migrate through Maine in October. In addition, the recruitment rate of 1.6 immature (young of the year) to one

adult female in 2009 was slightly below the long term average (1963-2008) of 1.7 immature per female. Recruitment rate is a measure of the ratio of immature woodcock per adult female derived from the Wing-Collection Survey described above. Maine hunters provided 1,561 wings to the survey.

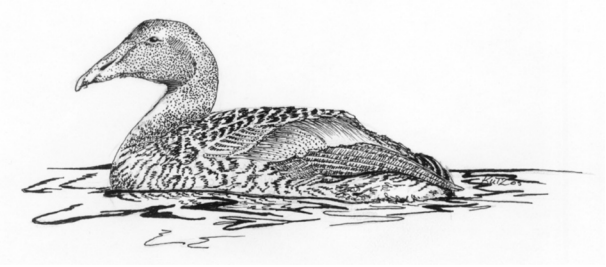
Waterfowl

Waterfowl harvest metrics are also derived from the same Harvest Information Program used to assess woodcock harvest. Harvest information for the 2002 to 2009 waterfowl seasons are listed below in Table 3.

Table 3. Maine Waterfowl Harvest 2002-2009.

Species	2002	2003	2004	2005	2006	2007	2008	2009
American Black Duck	9,717	5,045	5,765	7,623	5,387	5,000	4,683	5,364
Mallard	15,744	12,025	12,218	16,855	12,231	12,700	11,265	12,711
Green-Winged Teal	9,287	5,248	2,750	3,077	4,309	6,100	7,872	4,923
Wood Duck	7,319	3,822	4,231	6,224	5,577	5,400	3,461	7,641
Ring-necked Duck	1,845	459	529	699	1,300	300	747	1,763
Common Goldeneye	431	357	1,745	3,777	2,091	1,600	2,307	1,469
Total	44,343	26,956	27,238	38,255	29,895	31,100	30,335	33,871
Canada Goose	12,800	9,637	7,000	7,826	9,800	9,100	13,800	4,700
Sea Ducks								
Common Eider	20,600	28,967	14,736	10,842	18,133	13,100	11,143	4,355
Long-tailed Duck	2,800	2,612	1,754	690	1,779	1,000	4,305	656
Scoter	6,400	14,721	4,210	2,168	2,288	1,700	4,052	890
Total Sea Duck Harvest	29,800	46,300	20,700	13,700	22,200	15,800	19,500	5,901

Based on data using the Migratory Bird Harvest Information Program (HIP), 3,900 waterfowl hunters harvested 48,000 waterfowl in Maine (includes puddle ducks, diving ducks, sea ducks and geese). The 2009 total harvest was below the 2008 harvest of 57,300 waterfowl, and likewise, the number of waterfowl hunters was below the 2008 estimate of 5,700.



Upland Game Birds

Wild Turkey

The wild turkey program is a great success story in wildlife restoration and has allowed the Department to provide hunters the opportunity to harvest wild turkeys during spring and fall hunting seasons in Wildlife Management Districts that meet specific population criteria and harvest levels. Spring turkey hunting is the season of choice for the majority of turkey hunters when male turkeys are responsive to calls. Although spring wild turkey hunting license sales have seen a slight decrease, the harvest success rate remains high at over 30%. The fall harvest remains low although spiking in 2007 with the introduction of a shotgun season in certain Wildlife Management Districts (Table 4).

Table 4. Wild Turkey Spring (1999-2009) and Fall (2001-2009) Harvest.

Season	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Spring	890	1559	2544	3391	3994	4839	6236	5931	5984	6348	6043
Fall	NA	NA	NA	151	246	204	157	198	1843	685	712

Current Wild Turkey Management

In January of 2010, a report addressing the current status of Maine's wild turkey population was presented to the Maine Legislature. This was in response to a legislative resolve issued during the 124th legislative session. The resolve had tasked the Department to convene a working group of interested stakeholders from sportsmen's groups, agriculture, the National Wild Turkey Federation and the Department. The group met three times over three months and provided recommendations on future management of Maine's wild turkey resource. The recommendations seek a balance between hunting opportunity, sustaining the wild turkey population and addressing wild turkey nuisance issues.

2010 also marked a significant change in the spring turkey harvest limit from 1 bearded bird to 2, providing the hunter has the appropriate permits.

Ruffed Grouse

Beginning in 1994, moose hunters were asked to report the number of grouse they and their party saw or shot during the moose hunting season. Data are compiled by geographic region and MDIFW then calculates the number of grouse seen per 100 hours of moose hunting effort. Compared to an all-time low count in 2005, grouse numbers appear to be on the rise. The grouse population is following the peak and dip cycle inherent in their population ecology. The cycle is believed to be associated with the predator/prey cycle of Maine's hare populations. As hare populations increase, predation pressure on grouse decreases, allowing the grouse populations to rebound. Other factors are involved too as weather events play a role in population numbers as well. 2009 grouse numbers were much higher than the 2005 count. The statewide figure of 47 in 2009 was greater than the long term average of 36 grouse seen/100 hours (Table 5). Breeding conditions have been very favorable thus far in 2010 and should contribute to a successful hatch and good productivity.

Table 5. Grouse Seen or Harvested/100 hours of Moose Hunter Effort in Maine for the last 15 years (1995-2009).

Location	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Northeast	84	15	24	42	41	30	53	23	35	27	11	26	37	31	48
Northwest	125	22	33	48	47	50	55	43	50	56	24	45	44	51	101
Eastern Lowlands	57	16	22	27	30	25	55	29	29	24	8	20	53	23	34
West & Mountains	97	23	26	41	29	28	30	25	26	30	13	25	44	19	36
Downeast	-	-	-	-	-	-	-	13	21	20	9	22	19	28	30
Statewide	107	20	25	43	37	33	48	31	34	33	13	24	39	27	47

--Kelsey Sullivan

Golden Eagle

Increased reports of golden eagle sightings in Maine last year are encouraging and a reminder to look carefully at all dark-plumaged eagles. Easily confused with immature bald eagles at a distance, observers should note subtle details that distinguish them. Please report specifics of your sightings to any MDIFW wildlife biologist, but let us know the rationale behind your identification. Throughout most of the year, golden eagle numbers in Maine may be less than 10 individuals compared to nearly 1,000 immature bald eagles that reside across the state seasonally.

Golden eagles are almost uniformly dark, revealing amber highlights on the head and neck plumage in good lighting. The fine, buffy feathers that cover the lower leg are noticeable only at very close range. Juvenile golden eagles have a conspicuous white band across the base of their tail feathers and a white patch on the lower surface of the midwing area. Eagles that are mostly dark with "mottled" white patches elsewhere on the body are young bald eagles. Most of us have to judge silhouettes in flight to distinguish a golden eagle. The relative lengths of the tail, head area, and position of wings while soaring are good cues to experienced observers. Bald eagles frequent the waterfront, while golden eagles tend to be in upland settings. Body size is not different between the two types of eagles, although both increase in body size if they originate from more northerly latitudes. Thus, a golden eagle visiting Maine from northern Quebec in midwinter may indeed be larger than a resident bald eagle nesting here.

Historic golden eagle nests in Maine (abandoned since 1997) were all in the mountainous terrain of Oxford, Franklin, Somerset, and Piscataquis Counties. Many cliff settings once occupied by golden eagles are now used by peregrine falcons. An apparently small number of golden eagles reside nearby in northern Quebec and Labrador, but the species currently no longer nests in the eastern U.S. Golden eagle numbers are beginning to rebound at fall hawk watch stations throughout the Atlantic flyway. Migrant and wintering golden eagles visiting Maine range more broadly across the state but their overall abundance remains quite low in all seasons. One golden eagle fitted with a satellite radio transmitter has never strayed north of the St. Lawrence River since 2008 (see http://ccb-wm.org/programs/migration/GoldenEagle/goldeneagle.htm) and has most of the spring and summer breeding seasons during 2009 and 2010 in Maine. As a potential breeding resident of Maine in future years, its range and habits are already providing better insights about the potential for a limited recovery of golden eagles in Maine.

This work is supported by funds from State Wildlife Grants as well as state revenues from the Loon Conservation Plate and Chickadee Checkoff funds.

--Charlie Todd

Piping Plover

Piping plovers are small, sand-colored shorebirds that nest on sandy beaches and dunes along the Atlantic Coast from Newfoundland to South Carolina. Habitat loss, lack of undisturbed nest sites, and predation are the primary factors jeopardizing populations of piping plovers. With less than 2000 nesting pairs on the Atlantic coast, the piping plover is federally listed as Threatened and is listed as Endangered in Maine. Maine's population of piping plovers has been monitored annually since 1981. During this period the number of pairs has fluctuated between 7 pairs at 4 sites in 1983 to 66 pairs at 20 sites in 2002. Until recently the overall population trend has been one of increase.

Unfortunately, due to recent habitat loss from devastating spring storms, coupled with higher predation rates and greater presence of unleashed dogs on plover nesting beaches, plover numbers in Maine are declining at an alarming rate. Maine's piping plover population plummeted from a high of 66 pairs in 2002 to only 24 nesting pairs in 2008. In 2005, Maine piping plovers experienced a dismal nesting season. At 18 different beaches a total of 49 pairs of plovers made 82 nesting attempts but produced only 27 fledglings (0.55 chicks fledged per pair). This was the lowest productivity recorded since 1981, far below the productivity rate needed to sustain the plover population. In 2006, only 40 pairs of piping plovers returned to Maine to nest; nine plover pairs lost entire broods to predation and all other nests lost one or more chicks to predation. In 2007, piping plover habitats were plagued with a series of damaging spring storms combined with predation and human related disturbances. 2007 was another dismal year as Maine plovers produced only 37 fledglings!

With only 24 pairs of piping plovers returning to nest in 2008 and the realization we were very close to losing this species from our state, municipalities, landowners, government agencies, and private organizations combined efforts to protect nesting piping plovers in an attempt to reverse the declining population trend. The towns of Wells, Ogunquit, Old Orchard Beach, and Scarborough are committed to managing their beaches using guidelines established with MDIFW that provide recreational opportunities for beachgoers and still protect plover broods. These towns have included funds in their budgets to hire plover volunteer coordinators. Plover volunteer coordinators recruit and coordinate volunteers who monitor and help protect plover nests and chicks during the nesting season.

MDIFW, Maine's Bureau of Parks and Lands, Rachel Carson National Wildlife Refuge, Maine Audubon Society, APHIS Wildlife Services, The Nature Conservancy, and Bates College have a long-standing collaboration regarding piping plover management. Since the early eighties they have monitored and protected nesting plovers by providing field personnel, negotiating management agreements with landowners, compiling data, and working collaboratively with municipalities on beach management issues.

Intensive management efforts and dedication by the "plover community" in 2008 saw a reverse in the declining trend of plover productivity. Despite a 17 year low in nesting numbers, breeding success rose and a total of 24 nesting pairs successfully fledged 41 young.

Encouraged by recent successes and a better understanding of factors that limit nesting success, efforts are now underway to achieve even higher productivity rates for plovers in 2010. Management similar to last year will be combined with new initiatives. This year, town officials in Old Orchard Beach and Ogunquit are taking extra steps to assure plover success by designating a small portion of their beaches as a "Natural Beach Area". These areas are left in a natural state, allowing washed up seaweed or "wrack" to accumulate, trapping sand, encouraging beach grass, and providing habitat for plovers. Invertebrates within the wrack are an important food source for fast growing plover chicks and provide cover from predators.

Plovers also nest on beaches within Maine's State Parks. Maine's Bureau of Parks and Lands have a long-term commitment to these lands and wildlife protection. The Bureau will also provide plovers with fenced, natural areas, for nesting and park personnel will assist with plover monitoring efforts. Further, Cabela's, Inc. has generously donated two night vision cameras to allow the Bureau to monitor disturbance and predation events that may occur in plover areas after staff hours.

This year, Maine Warden Service wardens will be patrolling beaches in southern Maine throughout the nesting season making sure that beach visitors are respectful of the piping plover nesting areas, and to assure that dog owners keep their dogs on leashes and away from nesting areas.

MDIFW is asking for help from all beachgoers to protect these remarkable birds by observing these simple guidelines:

- Avoid fenced areas marked with "Restricted Area" signs.
- Observe birds and chicks only from a distance, with binoculars.
- Keep pets off the beach or leashed from mid-April to mid-September.
- Don't fly kites near posted areas. They resemble hawks and can keep birds away from nests.
- Take your food scraps and trash off the beach when you leave; it attracts predators such as skunks and raccoons.
- Call the Maine Warden Service to report harassment of birds. It's a federal offense to harm an Endangered Species.

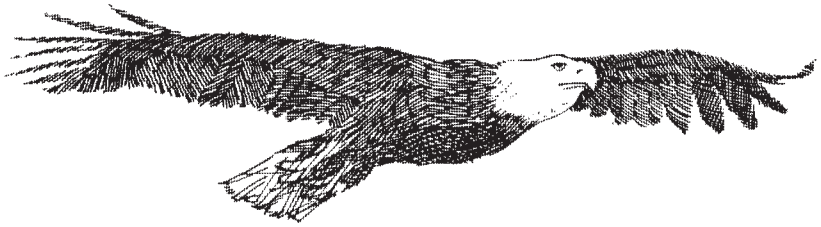
This work is supported by funds from State Wildlife Grants and Section 6 Funding as well as state revenues from the Loon Conservation Plate and Chickadee Checkoff Funds.

--Lindsay Tudor

Maine's Coastal Gull, Cormorant, and Bald Eagle Populations

In the early 1900s island-nesting seabird populations (including herring, great black-backed and laughing gulls and double-crested and great cormorants) were greatly reduced after decades of uncontrolled shooting and egg collecting. Population recovery began after passage of the Migratory Bird Treaty Act of 1918. Nesting habitat for these birds also became available as human populations left the island life and moved to the mainland. Population recovery for most of these species was dramatic. In fact, burgeoning populations of the larger predatory herring and great black-backs gulls soon began to prey on the smaller laughing gulls, terns and the ducklings of common eiders. Because of competition with these larger gulls, laughing gulls and other species' numbers plummeted. The laughing gull was considered extirpated from Maine in 1945. At a local scale, this changed in the 1980s when managers on 10 seabird islands eliminated all breeding populations of herring and great black-backed gulls on those islands. On these islands, the stage was set for tern and other seabird recovery. For gulls, the smaller laughing gull benefited from human intervention and management on certain islands and their numbers increased dramatically.

Experts attribute the expansion and growth of herring and great black-backed gull populations in the twentieth century not only to protective laws but also to an ever-expanding food supply. Gull populations expanded as they took advantage of the increase in human refuse at dumps and inshore fishing activities. But these conditions also changed. Most municipalities closed their landfills (open dumps) before the year 2000 because of the multi-million dollar cost share state program. For a host of reasons, many of the inshore fisheries suffered and fish and chicken processing facilities along the coast began to close. With less food available, gull numbers were predicted to decline. Further, adding to the decline in fishery resources, gulls (their chicks at least) now find themselves a major prey item of the state's expanding bald eagle population. Are they eating seabirds because there are few fish to catch and eat? All these factors, and likely others (i.e. predation by mink and river otters on coastal islands) have contributed to a 27% and 33% decline from peak populations in the mid 1990s in herring and great black-backed gull populations, respectively. It's a very dynamic system on Maine's coastal seabird nesting islands. Could this also be influencing the trend we are now seeing in southern Maine of gulls nesting on inner city roof tops, to escape island predators?



Cormorants were not originally protected under the Migratory Bird Treaty Act of 1918. However, cormorant populations did recolonize some of Maine's islands in the late1920s. But it was not until cormorants received protection under a 1972 amendment to the Migratory Bird Treaty Act did their numbers begin to expand. In fact, double-crested cormorant populations increased to over 15,000 pairs within just 5 years of protection. That population continued to grow through the 1980s when the coastal nesting population in Maine increased to over 28,000 pairs! But conditions changed dramatically for this species as well since the 1980s. Biologists speculate that an abundant population of bald eagles has played a significant role in the cormorant decline. We now estimate that the current double-crested population has been reduced by 67%; to a coastal nesting population of fewer than 10,000 pairs.

Great cormorants (the entire U.S. population) have experienced a similar fate. Their population increased from 46 pairs in 1983 to a peak of 260 pairs in 1992. Recently, a coast wide census revealed only 80 pairs in 2008. Intense predation by bald eagles threatens this species with extirpation from Maine.

What does the future hold for island-nesting seabirds? One cannot precisely gauge Maine's historic eagle population. Inventories began in 1962, and initial efforts revealed low numbers, reduced range, poor reproductive rates, and an uncertain future for the bald eagle in Maine. Scientists attributed a variety of human-related factors for the decline, including the widespread use of the insecticide DDT, which started in the late 1940s. Since the ban on this toxic substance, intensive management which included working with landowners to conserve eagle nesting sites, the eagle population gradually increased. In 2009, the total number of active nests in Maine exceeded 500. It's an interesting trade-off.

This work is supported by funds from State Wildlife Grants as well as state revenues from the Loon Conservation Plate and Chickadee Checkoff Funds.

--Brad Allen

Mammal Group

The Mammal Group is one of 4 groups in the Wildlife Resource Assessment Section (WRAS), in the Bangor Office. We develop and oversee the implementation of all management systems for Maine's mammals; address public and Departmental information needs through the development of research programs, monitoring protocols, species assessments, and public presentations; and assist in the formulation of harvest regulations by analyzing biological data, meeting with regional biologists, and making recommendations to the Department's upper administration.

Wally Jakubas, Mammal Group Leader – Supervises mammal group personnel, oversees all group activities, coordinates group activities within and outside of the Department, manages the group's budgets, serves as lead biologist on New England cottontail, wolf, and cougar issues.

Randy Cross, Wildlife Biologist – Supervises bear field crews; assists in analyzing bear data; oversees the processing and aging of moose, deer, and bear teeth; and gives public information talks and demonstrations on bear management activities.

John DePue, Wildlife Biologist – Oversees furbearer and small mammal management, annually reviews and proposes changes to Maine's trapping regulations, designs small mammal surveys, leads New England cottontail field activities and assists in their management, monitors white-nose syndrome in bats, assesses the impact of windpower projects on small mammals, and serves as Departmental spokesperson on furbearer and small mammal issues.

Lee Kantar, Wildlife Biologist – Oversees the management of Maine's white-tailed deer and moose populations, including biological data collection and analysis, formulation of annual season recommendations, and monitoring chronic wasting disease. Lee is the Departmental spokesperson on deer and moose issues.

Jennifer Vashon, Wildlife Biologist – Oversees black bear and lynx programs, including biological data collection and analysis, formulation of annual season recommendations for black bear, providing technical advice on nuisance bear issues, and development and implementation of the lynx management program. Jen also serves as the Departmental spokesperson on lynx and bear issues.

Lisa Bates, Bio Specialist – Helps coordinate field activities for the lynx research project, including field camp operations, trapping, and chemical immobilization of research animals, and assisting the lynx project leader with data entry and analyses.

2009-10 Contract Workers & Volunteers – Bear Project: Susan Bard, Brandon Coones, Craig McLaughlin, Jared Mitchell, Marcus Mustin, Dave Pert, Everett Smith, Dan Wagner, and Kelly Young; **Deer Project:** Jerry Collier, Brittany Currier, Trennan Dorval, George Haley, Dan Hansche, Robert Lambert, Eldon McLean, and Brian Schaffer; Lynx Project: Brandon Coones, Trennan Dorval, Erica Johnson, Andrew Ocampo, Alexej Siren (co-field leader), and Dan Wagner; **Moose Project:** Brian Schaffer; **New England Cottontail Project:** Steve Agius, Jim Agri, Kelly Boland (NEC Restoration Coordinator), Dan Brubaker, Elizabeth Deletetsky, Dorothy Fecske, Steven Lord, Wendy Patterson, Karrie Schwaab, Kimberly Tessier, Dave Tibbetts, Toni Weidman, Elizabeth Wolff, Tony and Nancy Viehmann, and Brad Zitske.

We deeply appreciate the dedication and hard work we receive from our contract workers and volunteers!

Mammal Conservation and Management

White-tailed Deer

2009 Season Dates and Structure

Maine Deer hunters could hunt white-tailed deer for 79 days within the structure of five different hunting seasons during 2009; expanded and special (October) archery, rifle, muzzleloader, and youth day.

2009 Doe Quotas, Any-Deer Permits, and Applicants

During 2009, doe quotas (the number of does that can be harvested within population objectives in a Wildlife Management District [WMD]) ranged from zero in 18 WMDs (districts 1-14, 18, 19, 27 and 28) to 798 in WMD 22. Among the 11 WMDs in which a doe harvest was desired, the doe quota totaled 4,787. An expansion factor (the estimated number of permits required to harvest 1 adult doe) is applied to the doe quota to ensure that doe harvest objectives are met for each WMD. Applying the expansion factor, permit levels for 2009 totaled 45,385 representing a 12.5% decrease in antlerless

deer hunting opportunity compared to 2008 (51,850 permits). Permit allocations ranged from zero in 18 WMDs, to 7,980 permits in WMD 22. The top 5 WMDs receiving any-deer permits on a per 100 mi^2 basis were WMD 22 (1,842 permits), WMD 23 (1,014 permits), WMD 21 (987 permits), WMD 24 (935 permits), and WMD 25 (718 permits). Maine residents drew 34,900 permits (77%), landowners drew 6,807 permits (15%) nonresidents drew 2,687 any-deer permits (6%) and Superpack permittees won 891 permits (2%). Overall, 59,673 people applied for any-deer permits during 2009 (54,730 residents 7,575 landowners; 4,942 nonresidents and 891 Superpack).

Statewide Statistics for 2009

Overall, 18,092 deer were registered during 2009, of which 1,813; 330; 14,838, and 1,111 were taken during the expanded archery and regular archery, youth day, regular firearms, and muzzleloader seasons, respectively (Table 6). There were 2,969 fewer deer harvested in 2009 than in 2008 (21,061 deer vs. 18,092), which represents a 14% decrease from the 2008 season. This was the second year in a row that the annual deer harvest was below the average harvest under the any-deer permit system primarily due to very severe back-to-back winters.

Table 6. Sex and age composition of the 2009 deer harvest in Maine by season type and week, statewide[1].

Season	Sex/Age Class				Total Deer	Total Antlerless Deer
	Adult		Fawn			
	Buck	Doe	Buck	Doe		
Archery	**625**	**800**	**180**	**208**	**1,813**	**1,188**
Expanded	340	410	90	107	947	607
October	285	390	90	101	866	581
Youth Day	**113**	**139**	**40**	**38**	**330**	**217**
Regular Firearms	**9,857**	**3,259**	**964**	**758**	**14,838**	**4,981**
Opening Saturday	1,004	354	109	83	1,550	546
Nov 2-Nov 7	2,621	903	294	215	4,033	1,412
November 9-14	2,182	602	181	147	3,112	930
November 16-21	2,257	608	151	131	3,147	890
November 23-28	1,793	792	229	182	2,996	1,203
Muzzleloader	**546**	**389**	**88**	**88**	**1,111**	**565**
Nov 30-Dec 5	211	100	26	25	362	151
December 7-12	335	289	62	63	749	414
Total	**11,141**	**4,587**	**1,272**	**1,092**	**18,092**	**6,951**

[1]Records corrected for season omissions
Sex/age data were corrected for errors in the deer registrations

Buck Harvest

The statewide harvest of antlered bucks (11,168) in 2009 is a 18% decrease from the previous year (13,564, Table 7). The top 5 buck-producing (per mi^2 basis) WMDs in 2009 were (in descending order), districts 24, 21, 22, 20, and 23/26 (excluding 29), all in central and southern Maine. Among the antlered bucks taken in 2009, roughly 4,914 (44%) were 1 ½ year-olds (yearlings) sporting their first set of antlers, while more than 2,010 (18%) were mature bucks (4 ½ to 15 ½ years old). Male fawns are reported with antlerless deer.

Antlerless Deer Harvest

The statewide harvest of adult (older than fawn) does during 2009 was 4,576, which was 9% below the pre-set quota (~5,037 adult does; including WMD 29). During 2009, any-deer permittees also tagged 1,882 fawns, while archers and youth day hunters tagged 466 young of the year. Overall, 6,924 antlerless deer were registered by hunters during the 2009 season.

Harvest by Season and Week

In 2009, approximately 82% of the total deer harvest occurred during the 4-week firearms deer season (Table 6). Total archery harvest changed only slightly (-2%), while the muzzleloader harvest increased by 6%. Good tracking conditions during the season may have improved conditions despite an overall tough season.

The eighth youth day took place on Saturday, October 24th. Due to the impacts from the severe winters, youth were relegated to bucks only in buck only WMDs but maintained either-sex opportunity in WMDs where permits were allotted. This explained the lower harvest of 330 deer by Youths with the antlerless portion comprising 66%.

Harvest By Hunter Residency

Residents tagged 92% (16,644 deer) of the total harvest during 2009 (Table 8). Among seasons, the proportion of the harvest registered by Maine residents was highest for the muzzleloader (97%) and youth day (97%), followed by archery (96%), and firearms (91%).

Table 7. Sex and age composition of the 2009 deer harvest in Maine by Wildlife Management District[1].

Wildlife Management	Adult		Fawn		Total Antlerless	Total All
District	Buck	Doe	Buck	Doe	Deer	Deer
1	50	0	0	0	0	50
2	15	0	0	0	0	15
3	31	0	1	0	1	32
4	48	0	0	0	0	48
5	77	0	0	0	0	77
6	151	1	0	0	1	152
7	287	3	3	1	7	294
8	165	3	2	0	5	170
9	68	0	0	0	0	68
10	59	0	0	0	0	59
11	227	3	0	0	3	230
12	421	26	10	5	41	462
13	260	31	8	9	48	308
14	188	5	4	2	11	199
15	763	358	101	87	546	1,309
16	881	390	124	95	609	1,490
17	1,171	521	156	132	809	1,980
18	197	5	5	1	11	208
19	76	1	0	0	1	77
20	738	390	98	81	569	1,307
21	815	522	114	110	746	1,561
22	627	492	149	130	771	1,398
23	940	612	187	166	965	1,905
24	395	276	73	67	416	811
25	781	379	86	70	535	1,316
26	939	295	69	73	437	1,376
27	325	0	4	0	4	329
28	152	0	1	0	1	153
29	321	263	61	63	387	708
Statewide	11,168	4,576	1,256	1,092	6,924	18,092

[1]Sex/age data were corrected for errors in the deer registrations

Table 8. Deer registrations by season type and residence of successful hunters, statewide in Maine during 2009.

Season & Week	Deer Registrations By: Residents	Nonresidents	Total	Percent by Residents
Archery	**1,741**	**70**	**1,813**	**96**
Expanded	908	39	947	96
October	833	31	864	96
Youth Day	**321**	**9**	**330**	**97**
Regular Firearms	**13,499**	**1,335**	**14,838**	**91**
Opening Saturday	1,546	0	1,550	100
Nov 2-Nov 7	3,668	365	4,033	91
November 9-14	2,796	316	3,112	90
November 16-21	2,731	416	3,147	87
November 23-28	2,758	238	2,996	92
Muzzleloader	**1,083**	**28**	**1,111**	**97**
Nov 30-Dec 5	346	16	362	96
December 7-12	737	12	749	98
Total	**16,644**	**1,448**	**18,092**	**92**

Regional differences occurred in the distribution of the harvest by residents and visitors to Maine. In the more populous central and southern WMDs, most successful deer hunters were Maine residents. In 2009, non-residents harvested fewer deer than normal. The proportion of deer harvested by non-resident hunters was highest in WMD 2, along the Canadian border, where 42% of the harvest went to non-residents. At the other end of the spectrum, 99% of the deer killed in heavily populated WMD 21 and 22 (southern Maine) were registered by Maine residents.

Hunter Participation and Success Rate
During 2009, 200,239 licenses that permit deer hunting were sold in Maine; of these 87% were bought by residents. Hunter density, therefore, averaged about six per square mile, statewide, and these hunters expended an estimated 1.08 million hunter-days effort pursuing deer over Maine's 79-days of deer hunting.

Compared to the regular firearms season, which attracts over 170,000 participants, the expanded archery and special muzzleloading seasons attract far fewer hunters. In its 13th year, the expanded archery season attracted just under 10,000 participants (over 90% residents). On a positive note, the sale of special muzzleloading season permits has increased substantially over the last 10 years. In 2009, muzzleloading permits remained similar to 2008 with 18,062 permits.

Deer hunting success (based on total number of estimated hunters and registered harvest) in Maine during the regular firearms season was estimated at 11% in 2009. The success rate for hunters who drew an any-deer permit (range 20% - 48%) is typically higher than for hunters who were restricted to "bucks-only" during the regular firearms season (range 7% - 22%).

Prospects for the 2010 Deer Season
In 2010, we will offer 5 separate deer hunting seasons in Maine. The expanded archery season will open September 11th and run until to December 11th (79 days). This season is limited to WMDs 24 and 29 (formerly WMD 30 Northeast to Vinalhaven), as well as 9 other locations, primarily in residential-suburban sprawl areas with firearm discharge ordinances. Hunters with a valid archery license may purchase multiple antlerless permits for $12.00 each and one buck permit for $32.00. This amount of bowhunting opportunity is aimed at increasing the harvest of does and fawns in order to meet population density objectives for areas that are difficult to access for hunting. In the expanded archery zone, deer populations can only be reduced if the limited number of archers that can gain access to huntable land are each able to harvest a substantial number of deer.

The regular (statewide) archery season will run from September 30th - October 29th (26 days). Youth day will be Saturday, October 23rd, and is reserved for hunters between 10 and 15 years old, who are accompanied by a licensed adult (who is not allowed to carry a hunting weapon). The 25-day regular firearms season opens for Maine residents on Saturday, October 30th, and for nonresidents the following Monday. This season ends the Saturday following Thanksgiving (November 27th). Finally, the muzzleloader season will begin in all WMDs on November 29th, but will end on December 4th (6 days) in WMDs 1 – 11, 14, 19, 27 and 28. Elsewhere, the muzzleloading season will continue until December 11th (12 days). Crossbow archery season will coincide with modern firearms.

Availability of any-deer permits among our 29 WMDs is directly related to our deer management objectives. Very conservative doe harvests are required in eastern and northern WMDs where we are trying to increase deer densities. In contrast, does must be more heavily harvested in WMDs where current objectives are to stabilize deer populations to the 15 or 20 deer / mi^2. Abundance targets were set following input from a Public Working Group whose task was to formulate Maine's deer management goals.

To accomplish deer management objectives in 2010, we have set doe harvest quotas ranging from zero to 738 among our 29 WMDs. Totaling 5,672 does statewide, the 2010 doe quota is 24% above the doe harvest we achieved in 2010. The increased doe quota in 2010 reflects the increased survival rates and productivity after a very mild winter across the state. A total of 48,825 any-deer permits will be issued statewide ranging from 490 permits in WMD 13 to 7,800 in WMD 23. No permits will be allocated in WMDs 1-11, 14, 18, 19, 27 and 28.

The allocation of 48,825 any-deer permits, along with the archery and youth seasons, should result in the statewide harvest of roughly 5,922 does and an additional 2,982 fawns in 2010. Antlered buck harvests should approximate 12,015, which is about a 5% increase from the 2009 buck kill of 11,460. The impact of two tough winters on deer survival is still being felt, however we should see some positive gains after the recent mild winter. If normal hunting conditions and hunter effort take place the statewide deer harvest in Maine should be in the vicinity of 20,919 deer.

--Lee Kantar

**FOR MORE INFORMATION ON DEER HARVESTS, SEASONS, ETC.,
PLEASE VISIT THE DEPARTMENT LINK LISTED BELOW:
http://www.maine.gov/ifw/wildlife/surveys_reports/research_management/index.htm**

Moose

2009 Season Dates and Structure

Maine Moose hunters could hunt moose for 6 days by permit within the structure of a split season framework (September/October) during 2009. The September season ran from September 28th to Oct. 3rd, while the October season ran from the 12th through the 17th. In addition, 2009 marked the second November moose hunt in Department history (covering southern Wildlife Management Districts [WMDs] 15, 16, 23 and 26). The season ran concurrent with the November deer season from November 2nd to November 28th and opened for Maine residents on October 31st.

Moose Permits and Applicants

The annual allocation of moose permits is related to the management goals for each WMD. Moose management goals are categorized as either recreational, compromise, or road safety. Permit levels remained the same for most traditional moose hunting districts between 2008 and 2009 with the exception of downeast WMDs 19 and 28. WMD 19 had an increase of 5 bull permits while WMD had a decrease of antlerless permits by 5. The southern Maine moose hunt in WMDs 15, 16, 23, and 26, provided an additional 135 any-moose permits. An any-moose permit allows the permittee to harvest either a bull or cow. The total number of moose permits issued in 2009 was 3,015.

During 2009, Antlerless Only Permits (AOPs) ranged from zero in 7 WMDs (districts 2, 4, 5, 7-9, and 14) to 280 in WMD 6. Among the 19 WMDs in which a cow harvest was desired, the permit allocation totaled 780. The number of AOPs allocated in a given district reflects that WMD's moose cow quota. Consequently, WMDs that can sustain only limited cow mortality are allocated relatively few antlerless permits. In contrast, WMDs that can support higher cow mortality (and still meet management objectives) are allocated more permits (Road Safety Management WMDs). The southern Maine WMD moose hunt is a slight variation on this. Permit type was structured as any-moose and the season was extended to the length of the November deer season to increase the chances of a hunter harvesting a moose within a district where densities are low and landowner access is difficult. The November time frame was chosen to honor recommendations by landowners who wanted the southern Maine moose season to open concurrently with the November firearms season for deer.

Permits are allocated to qualified applicants in a random computerized lottery. Maine residents can purchase additional chances in the lottery as follows: one chance for $7.00, three chances for $12.00 and, six chances for $22, while non-residents can increase their odds as follows $15.00 = One-chance, $25.00 = Three-chances, $35.00 = Six-chances, $55.00 = Ten-chances. In addition, nonresidents may purchase multiples of 10 chances at $55.00 each. No more than 10% of the permits for each WMD may go to a non-resident. Upon selection, resident and non-resident permit fees are $52.00 and $477.00 respectively. Overall, 56,608 people applied for a moose permit during 2009. This included 40,958 residents and 15,650 non-residents. Out of those applicant pools, 6.6% of the residents and 1.9% of the non-residents were selected for permits.

Statewide Statistics for 2009

Overall, 2,348 moose were registered during 2009 (Table 9). In 2009, 114 more moose were harvested during the Sept/Oct hunt than in 2008 or a 5.1% increase (2,202 vs. 2,316) moose). The 2009 harvest was 3% above the average number of moose harvested over the last 9 years of moose permit allocations by Wildlife Management District. Since the re-institution of moose hunting in 1980, moose season timing (split season started in 2002) and areas open to hunting has changed several times.

Bull Harvest

The statewide harvest of bulls during the Sept/Oct season (1,739) in 2009 marked a 3% increase from the previous year (1,682). Among the antlered bulls taken in 2009, roughly 182 (11%) were 1 ½ year-olds (yearlings) carrying their first set of antlers, while 294 were 2.5 years old making up 18% of the bull harvest. Mature bulls (4 ½ to 14 ½ years old) comprised 61% of bulls older than 2.5.

Breeding bulls can lose an average of approximately 15% of their body weight during the rut. Because of this and the timing of the fall harvest, bull weights reflect a decrease in body weight from September to October. Average bull weights in the 2009 harvest for September were 735 pounds versus 677 pounds in the October harvest (>8% decline). The two heaviest bulls weighed in at 1,040 dressed (no digestive tract, heart, lungs, or liver) and were killed in WMD 1 and 4 during the September season. The largest measured spread was 66 inches on a 6.5 year old bull harvested in WMD 1, and the highest number of points was counted on a 7.5 year old bull shot in WMD 2 with a total of 31 legal points. Among 1,668 bulls examined in the harvest, 18% of the bulls sported cervicorn antlers (antlers without a defined palm) and 52% of these animals were yearlings; 16% were mature bulls (>4 years old) including the oldest at 13.5.

Table 9. Moose Harvest and Success Rates by Wildlife Management District and Season for 2009 in Maine.

								PERMITS			SUCCESS		
	WMD	Bull	Cow	Bull Calf	Cow Calf	Total Antlerless	Total	BOP	AOP	Total Permits	BOP	AOP	Total
SEPTEMBER	1	84	4			4	88	90	5	95	0.93	0.80	0.93
	2	67					67	71		71	0.94		0.94
	3	145	40	3		43	188	169	57	226	0.86	0.75	0.83
	4	178					178	191		191	0.93		0.93
	5	84					84	94		94	0.89		0.89
	6	147	35	2	4	41	188	165	70	235	0.89	0.59	0.80
	11	86	12	2	1	15	101	120	30	150	0.72	0.50	0.67
	19	41	4	1		5	46	67	10	77	0.61	0.50	0.60
	Total	832	95	8	5	108	940	967	172	1,139	0.86	0.63	0.83

								PERMITS			SUCCESS		
	WMD	Bull	Cow	Bull Calf	Cow Calf	Total Antlerless	Total	BOP	AOP	Total Permits	BOP	AOP	Total
OCTOBER	1	30	14			14	44	30	15	45	1.00	0.93	0.98
	2	24					24	24		24	1.00		1.00
	3	50	144	4	10	158	208	56	173	229	0.89	0.91	0.91
	4	57					57	64		64	0.89		0.89
	5	30					30	31		31	0.97		0.97
	6	52	149	10	16	175	227	55	210	265	0.95	0.83	0.86
	7	108					108	125		125	0.86		0.86
	8	214					214	235		235	0.91		0.91
	9	49					49	50		50	0.98		0.98
	10	58	7			7	65	100	10	110	0.58	0.70	0.59
	11	35	52	6	2	60	95	40	90	130	0.88	0.67	0.73
	12	28	10	1	2	13	41	35	20	55	0.80	0.65	0.75
	13	27	2			2	29	35	10	45	0.77	0.20	0.64
	14	28				0	28	35		35	0.80		0.80
	17	13	7		1	8	21	30	30	60	0.43	0.27	0.35
	18	44	15			15	59	80	20	100	0.55	0.75	0.59
	19	19	8			8	27	23	10	33	0.83	0.80	0.82
	27	9	2			2	11	25	5	30	0.36	0.40	0.37
	28	32	6		1	7	39	60	15	75	0.53	0.47	0.52
	Total	907	416	21	32	462	1,376	1,133	608	1,741	0.80	0.76	0.79

								PERMITS		SUCCESS	
	WMD	Bull	Cow	Bull Calf	Cow Calf	Unk	Total	AMP	Total Permits	AMP	Total
NOVEMBER	15	11					11	25	25	0.44	0.44
	16	9	2		1		12	20	20	0.60	0.60
	23	3	2			1	6	45	45	0.13	0.13
	26	2	1				3	45	45	0.07	0.07
	Total	25	5		1	1	32	135	135	0.24	0.24

Antlerless Harvest

The statewide harvest of adult (older than calf) cows during 2009 was 516 compared to 485 in 2008 or a 6% increase. During 2009, antlerless-only permittees also tagged 67 calves that included 29 males and 38 females. Overall 576 antlerless moose were registered by hunters during the 2009 season. This increase included the antlerless moose taken as part of the 135 Any-moose permits issued within the southern zones. The antlerless moose harvest in the southern zones was comprised of 5 adult cows and one female calf.

Harvest by Season and Week

Maine's moose hunting was split into two seasons (i.e., September and October) from 2002-2007. In 2008 the southern Maine moose hunt added the month of November to the roster. Now, a hunter is issued a permit for one of three seasons and can hunt for a maximum of 6 days during September or October, or during the entire firearms deer season in WMDs 15, 16, 23, and 26. Permit levels for the three separate moose hunting seasons were 1,139 and 1,741 for September and October, or (39/61split); and 135 permits for November.

Hunter Participation, Residency and Success Rate

In 2009, 2,707 residents and 309 non-residents won permits to hunt moose. A total of 302 non-residents hunted for moose across all open WMDs with a 100% success rate. Representing 38 states (as far away as Washington State) and 2 provinces (New Brunswick and Quebec); the majority (13%) came up from Massachusetts. Resident success rates

were 76% and when combined with the outstanding success by out-of-staters, the total success rate was 80% statewide. Success rates over the last 9 years have been around 79%.

Changes for the 2010 Moose Season

In 2010, we will offer 4 separate moose hunting periods in Maine; September, October and November. The September season will run from September 27th to October 2nd in WMDs 1-6, 11 and 19; the October season will run from October 11th through the 16th and include WMDs 1-14, 17-19, 27, and 28. In WMDs 15, 16, 23 and 26, the season will coincide with November's deer season running from November 1st through November 27th. Opening day for Mainers will be on Saturday October 30th. Also new for 2010, WMDs 2, 3, 6 and 11 will have an additional moose hunt in November from the 1st through the 6th; this is in large part due to a management strategy change in WMD 2 (from Recreational to Compromise) that will require an increase in permit allocations to reduce moose abundance in WMD 2. And for the third year a total of 135 permits will be allocated for any moose (bull, cow or calf) in WMDs 15, 16, 23, and 26. The respective distribution in these WMDs will be 25, 20, 45, and 45 permits. In total, Maine's moose hunt will offer a total of 3,140 permits for 2010.

--Lee Kantar

Black Bear

The expansive forest of northern, eastern, and western Maine supports the largest black bear population in the eastern United States (Figure 1). Because Maine's forest is dense and bears are more common in rural northern and eastern Maine, people rarely see bears and conflicts are relatively low. Although bears were once considered a pest and indiscriminately hunted, today black bears are valued by hunters, outdoor enthusiasts, and the general public. Because conflicts can still occur, our management strives to conserve bears and provide viewing and hunting opportunities while minimizing conflicts with people. For more than 30 years, the Department has been committed to conserving Maine's black bear population and monitors bears in 3 different areas to ensure our management decisions are based on current and sound information. Recently, we began an effort to update and improve our bear population estimates by collecting black bear home-range and density estimates by equipping a sample of bears with GPS collars. These collars provide more information on bear movement patterns than traditional radio collars and will also help us assess the importance of different habitats to bears. In 2008, we began collecting teeth from harvested black bears to estimate the age structure of Maine's bear population and monitor population trends.

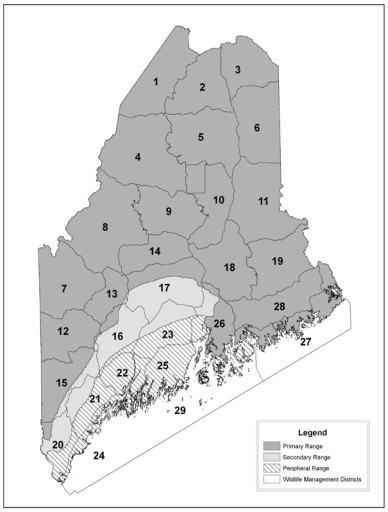


Figure 1. Maine Black Bear Range.

Living with Black Bears

After a long winter of fasting, bears emerge from their dens hungry. In their search for food, some bears encounter food odors that attract them to back yards, communities, and agricultural fields. Once berries begin to ripen in early summer, bear complaints usually diminish. Since many of us choose to live in rural areas, we can take a few steps each spring to reduce encounters with black bears in our back yards and fields.

- Bring your bird feeders in by April 1 and do not resume feeding birds until the late fall.
- Store bird seed in secure location and remove waste seed from the ground.
- Keep your garbage secure in a building.
- Do not bring trash to the curb until the morning of pick-up.
- Keep dumpster lids secure and if a dumpster is overflowing with garbage, call the disposal company and have the waste removed.
- Keep pet and livestock feed in a building or other secure enclosure.
- Clean or burn off outdoor grills to reduce food odors; if possible, store the grill in a building when not in use.
- Use electric fence around bee hives and avoid setting hives close to forested edges.
- When possible keep livestock and poultry indoors at night.

Remember, if your neighbors are not taking these steps as well, then bears may continue to frequent the area.

Because trapping and moving bears provides a quick fix to a problem and is perceived as a humane response, most people expect the Department to move bears that are around backyards, communities, agriculture and livestock. However, trapping and moving a bear is not always appropriate; it is costly and bears that are trapped and transferred to a new area often do not stay. These bears can cause additional conflicts by eventually returning to the problem area and are at greater risk of mortality (encounter more roads, other bears, and people). Because moving a bear immediately resolves the problem, it may be appropriate to move a bear whose behavior risks human safety or when substantial damage has occurred. However, after the bear is moved, attractants must be removed or secured to prevent future problems. The best solution is for individuals and communities to avoid attracting bears and other wildlife to their backyards and fields by removing food and attractants.

The 2009 Black Bear Hunting and Trapping Season

The Department's management of Maine's black bears includes regulating the harvest by setting the season length, bag limit, and legal methods of hunting; requiring that hunters report their harvest; and monitoring harvest levels. The Department can make adjustments to these regulations as needed to meet Maine's bear harvest objectives.

Currently, hunters are allowed to harvest one bear during the fall using a variety of methods. The general hunting season for black bears opens the last Monday in August and closes the last Saturday in November. Hunters are allowed to hunt bears near natural food sources or by still-hunting throughout this 3-month period. Hunting bears over bait is permitted for the first 4 weeks and with the use of hounds for a 6-week period that overlaps the last 2 weeks of the bait season. Trappers can harvest a bear in September and October.

Despite a long stalking and still-hunting season, most bears in Maine are harvested over bait. In 2009, 84% of the bears were taken over bait, 9% with hounds, 4% by still-hunting or stalking, and 2% in traps. More bears were harvested in Aroostook County than any other county, and accounted for 30% of the harvest. Few bears were harvested in central and coastal Maine (i.e., Knox, Lincoln, Waldo, Androscoggin, Cumberland, Sagadahoc, Kennebec, and York counties) where bear populations are low and hunting opportunity is limited.

Following 4 years of a harvest just below 3,000 bears and lower hunter participation, the 2009 harvest of 3,486 bears marks the return to previous harvest levels. Although there was slight increase in permit sales in 2009, the lack of fall foods for bears was likely responsible for the higher harvest in 2009 as hunters and guides reported more bears visiting bait sites. Non-resident hunters continue to enjoy hunting bears in Maine with half the bear permits sold to non-residents in 2009. Although non-resident permit holders account for half of Maine's bear hunters, they continue to harvest about 2/3 of the bears. While most non-resident hunters hire a guide, few resident bear hunters hire guides, which may account for the higher success rate of non-resident hunters. In 2009, non-resident hunters harvested the majority of bears during the bait (66%) and hound seasons (65%). Hunting over bait is also the most popular method for resident bear hunters, and accounted for 78% of their harvest. Although few bears are taken during the firearms season for deer or in traps, Maine residents harvested the majority of bears taken by these methods (91 and 81% respectively in 2009).

Table 10. Number of bears harvested in Maine in 2009 by Wildlife Management District (WMD).

	Method of Take									
WMD	Hunting with Bait	While Deer Hunting	Hunting with Dogs	Trapping	Unknown	Total Harvest	Archery	Assisted by Guide	Resident	Non-resident
1	139	2	10	0	8	**159**	16	143	17	142
2	141	0	20	0	0	**161**	19	142	21	140
3	171	3	6	2	8	**190**	28	137	61	129
4	252	0	4	3	8	**267**	35	223	47	220
5	162	1	6	0	1	**170**	22	157	18	152
6	212	1	17	2	7	**239**	40	173	72	167
7	132	1	12	7	1	**153**	21	106	52	101
8	254	1	36	11	2	**304**	21	197	118	186
9	119	0	4	2	7	**132**	18	82	47	85
10	137	0	4	1	2	**144**	12	103	39	105
11	240	2	25	5	7	**279**	22	185	74	205
12	117	3	41	6	2	**169**	24	88	87	82
13	36	5	22	8	2	**73**	6	33	48	25
14	69	1	12	5	1	**88**	8	54	46	42
15	40	9	15	4	3	**71**	10	5	57	14
16	6	6	1	0	1	**14**	0	2	14	0
17	50	10	8	4	1	**73**	10	24	45	28
18	213	2	6	4	11	**236**	20	119	114	122
19	124	0	32	1	4	**161**	12	123	46	115
20	9	3	0	0	1	**13**	1	1	13	0
21	0	1	0	0	0	**1**	0	0	1	0
22	0	1	0	0	0	**1**	0	0	1	0
23	4	0	0	0	0	**4**	0	0	4	0
24	5	0	0	0	0	**5**	1	0	5	0
25	4	0	0	0	0	**4**	0	1	3	1
26	60	8	0	0	1	**69**	11	13	56	13
27	61	2	8	0	3	**74**	10	25	49	25
28	149	3	37	7	3	**199**	17	70	106	93
29	29	0	3	0	1	**33**	5	17	17	16
State Totals	**2,935**	**65**	**329**	**72**	**85**	**3,486**	**389**	**2,223**	**1,278**	**2,208**

Although bear permit sales have declined since 2003, especially among residents following a rise in fees (resident from $5.00 to $25.00 and non-residents from $15.00 to $65.00), overall permit sales have stabilized at initial levels (~10,000 permits). Following the closure of the spring bear hunt in Ontario in 1999, we observed greater interest among non-resident bear hunters. Although non-resident permit sales have declined in recent years, their participation remains above early (1990) levels. The down turn in the US economy has likely contributed to recent lower bear hunter participation, especially among non-residents. If hunter participation continues to decline, we may need to increase hunting opportunities to meet bear management goals.

Prior to 2008, trappers and non-resident deer hunters were not required to purchase a bear permit to harvest a bear later in the season. Funds from this new late season permit are dedicated to bear research and management. Currently we are using these funds to collect teeth from harvested black bears to monitor the age structure of Maine's bear population and trends in bear numbers. In 2008 and 2009, 1,304 and 1,163 late season bear permits were sold. Even with the addition of these permits, hunter participation remained under 11,000.

This work is supported by federal excise taxes on sporting arms, handguns, ammunition, and archery equipment (Pittman-Robertson Fund), hunting and trapping license revenues, and a grant from Safari Club International and GMO.

--Jennifer Vashon

Furbearers and Small Game Mammals

Furbearers include all mammals harvested primarily for their pelts. In Maine, these include coyote, red and gray fox, bobcat, fisher, marten, raccoon, skunk, short- and long-tailed weasels, mink, otter, beaver, muskrat, and opossum. The pelts of all furbearers, except weasel, raccoon, muskrat, skunk, and opossum are tagged for tracking the furbearer harvest. Pelt tagging is one of the primary population indices used in our furbearer management systems. Furbearers are primarily trapped but some species (i.e., fox, coyote, bobcat, raccoon, and skunk) are also hunted. Small game that can be hunted includes snowshoe hare, gray squirrel, woodchuck, porcupine, and red squirrel.

Overview of Trapping Season

Trappers enjoyed early spring conditions this past season and should have had good opportunity to trap in open water for beaver and muskrats. Unfortunately, we do not have all the harvest data at this time, therefore we present last season's final fur harvest figures (Table 12). Anecdotal reports from trappers indicate that conditions were perfect to take advantage of the extended beaver season in many WMDs, and we hope that effort will help prevent some beaver nuisance issues. Troubles in the global economy continue to affect the demand for furs, and the result was a general decline in fur prices (Table 11). Although not reflected in the date presented in Table 11, muskrat pelt prices increased significantly at the Canadian auctions held in March which sparked some interest from trappers to target muskrats this past spring.

Table 11. Average pelt price offered for furs by Maine furbuyers over the last 6 trapping seasons. Prices followed by a superscript (h or L) were significantly higher or lower than the average pelt price the previous 5 years for that species.

Species	09-10	08-09	07-08	06-07	05-06	04-05
Beaver	$16	$18	$21^{h}	$21^{h}	$18	$17
Coyote	$13^{L}	$16^{L}	$21	$22^{h}	$17	$16
Red fox	$13^{L}	$17^{L}	$20	$22^{h}	$17	$16
Fisher (Male)	$28^{L}	$39	$61^{h}	$71^{h}	$31	$27
Fisher (Female)	$42^{L}	$42	$63^{h}	$74^{h}	$27	$21
Muskrat	$3.97	$2.56	$2.56	$6^{h}	$2.60	$1.69
Raccoon	$8^{L}	$10	$11^{h}	$11^{h}	$7.80	$8.78
Weasel	$2.44	$3.13	$3.67^{h}	$3.31^{h}	$2.21	$1.96
Bobcat	$37^{L}	$51	$60^{h}	$59^{h}	$49	$44
Grey fox	$14^{L}	$21	$32^{h}	$24^{h}	$17	$12
Pine Marten	$22^{L}	$26	$32	$45^{h}	$25	$21
Mink (Male)	$11^{L}	$12	$13	$22^{h}	$15	$12
Mink (Female)	$7	$7	$7	$13^{h}	$10	$8
Otter	$33^{L}	$41	$41^{L}	$45^{L}	$70	$68
Skunk	$3.07^{L}	$3.14^{L}	$4.67^{h}	$5^{h}	$3.50	$2.79

Table 12. Harvest of furbearing animals in Maine. Harvest records are from pelt-tagging records collected from the 2002-2003 to 2008-2009 trapping seasons. Pelt-tagging records may under-represent the harvest of coyote and beaver.

Species	08-09	07-08	06-07	05-06	04-05	03-04	02-03
Beaver	9,119	6,357	12,635	11,094	10,436	8,222	7,809
Bobcat	407	410	344	344	376	273	331
Coyote	1,901	1,819	2,007	2,077	2,175	2,459	2,287
Fisher	1,456	993	1,968	1,810	2,174	2,526	2,630
Red fox	893	1,030	1,245	1,067	1,413	1,535	1,469
Grey fox	163	161	107	67	125	196	172
Marten	2,291	2,401	2,350	3,873	2,248	5,088	2,908
Mink	1,297	1,888	2,280	1,108	1,224	904	935
Otter	528	493	968	1,041	1,113	931	803

This past trapping season we initiated data collection of muskrat pelts from trappers at fur auctions to attempt to understand trapping effort and age structure of harvested muskrats. We looked at over 1,400 muskrat pelts from both the Dixmont and Wells auctions. On average, it took trappers 19 trap nights to capture 1 muskrat (where one trap night is equal to one trap set for one night), and 3 juveniles were captured for every adult. The fall 2009 trapping success rate was lower than what was reported by trappers in the trapper log book surveys from the 1990's. The average number of trap nights needed to catch a muskrat during the 1990's was 13 trap nights to capture 1 muskrat. In other words, a trapper would have to trap 44% longer in 2009 to catch the same number of muskrats the trapper caught in the 1990s, if the trapper used the same number of traps. There are limitations to what these data can tell us, but it is a start. With more data in the coming years we will be able to make comparisons between seasons and years, which may shed light on the question of what factors are influencing our muskrat populations.

Funds for managing Maine's furbearers primarily come from the sale of hunting and trapping licenses, and from federal excise taxes on sporting arms, handguns, ammunition, and archery equipment (Pittman-Robertson Fund), and funds from Loon Conservation Plate funds.

--John DePue

Canada Lynx

The lynx is a medium-sized cat and can be distinguished from a bobcat by its completely black-tipped tail, longer ear tufts, and larger paws. Lynx populations are influenced by the numbers and distribution of snowshoe hare -- their primary prey. Maine is at the southern extent of the lynx range where forests transition from spruce-fir to hardwood and where winter snow depths lessen. Snow track surveys initiated in 2003 indicate that lynx distribution has not changed substantially over the last 100 years. Lynx remain common north of Moosehead Lake and west of Route 11, rare in areas south and west of Moosehead Lake, and absent from the remainder of the state. Canada lynx are a federally threatened species and Maine is home to the only known breeding population of Canada lynx in the eastern United States.

A History of Lynx in Maine

Snowshoe hare are most numerous in young stands of spruce and fir and forests with a dense understory of young conifers. Historically, it appears that lynx have persisted in low numbers with brief periods of abundance. Lynx were likely more common in the mid-1800s following the first major spruce budworm outbreak and harvest of spruce and fir. As the forest matured, lynx again became less common. By the late 1970s, mature spruce and fir reached record levels, which helped trigger another major budworm outbreak. The extensive clearcutting that followed created record levels of lynx habitat by the late 1990s.

A statewide bounty was offered on all wildcats until 1967 and hunting and trapping seasons on lynx were closed. In 1997, lynx were designated as a species of special concern. The special concern designation is given to species that may

become endangered or threatened and thus warrant special attention. In 2000, the US Fish and Wildlife Service (USFWS) listed lynx as a threatened species in 14 states including Maine. Although federally listed, lynx did not meet the State's threatened or endangered listing requirements. Information gathered from snowtrack surveys and telemetry studies in northern Maine were critical in making this determination. In 2005, the USFWS drafted a recovery outline for lynx that serves as an interim guide for recovery and in 2009 designated 9,500 mi^2 of private forest in northern Maine as habitat critical to lynx recovery.

As a threatened species, lynx are protected from intentional and accidental harassment (take) that may or may not result in the direct death of a lynx. The Department and the USFWS have been working on minimizing potential takes of lynx in Maine. In 2008, the Department submitted an incidental take plan that would allow a low level of incidental take of lynx by fur trappers by providing measures to minimize the accidental catch of lynx in traps to the maximum extent practicable. The USFWS is currently reviewing this plan.

From Research to Management
Biologists at IFW have been in the process of building a lynx management system that involves collecting field data, analyzing what it means, getting input on management goals, and developing a management system. The process started in the winter of 1999, with the first radiotelemetry study on Canada lynx in Maine. This summer, Department biologists will remove the last radiocollar and shift their focus from acquiring field data to applying information from this long-term study to management and conservation strategies for lynx in northern Maine. Currently, Department biologists are developing an assessment of lynx habitat and population levels in Maine to guide future management decisions.

In the last 12 years, Department wildlife biologists have captured and marked 87 lynx and documented the production of 108 kittens on a small study area in northern Maine. Notably, after a 2-year hiatus, lynx on the study area produced kittens again. This spring, we documented 12 kittens in 5 litters. By studying lynx, Department biologists were able to determine what habitats lynx prefer, the overall quality of habitat based on the ability of lynx to survive and reproduce, and how much area a lynx needs. Data from this study has shown that lynx and snowshoe hares thrive in the regenerating thickets of spruce and fir following logging and lynx can exist at high densities in northern Maine when this ideal habitat is common.

Over the last decade, Maine's lynx population reached record numbers following the spruce budworm outbreak and extensive salvage logging of spruce and fir. Although beneficial to lynx, this level of cutting was not sustainable. Future sustainable management of northern Maine's spruce/fir forest *can not* produce similarly high levels of snowshoe hare and lynx habitat, but may result in a more stable lynx population. Forest management that maintains connected patches of dense to moderately dense young spruce/fir will benefit lynx. Conversely, forest management that harvests younger trees; particularly sapling spruce and fir (e.g., biomass harvesting), does not promote moderate to dense regenerating of spruce and fir, or fragments lynx habitat may be detrimental to lynx.

Because lynx have a competitive advantage over other predators in deep snow, predictions of winters with more rain will likely cause lynx to retract northward. Consequently, efforts to maintain connectivity between neighboring lynx populations in Quebec and New Brunswick may allow lynx to persist longer in more northern portions of the state. Regardless of climate change, Maine's lynx population will likely never be this high again. Thoughtful planning and continued monitoring is needed to ensure a lower but more stable population of lynx in northern Maine.

This work is supported by non-game federal funds (Section 6 and State Wildlife Grants), federal excise taxes on sporting arms, handguns, ammunition, and archery equipment (Pittman-Robertson Fund), hunting and trapping license revenues, the Maine Outdoor Heritage Fund, Loon Conservation Plate funds, the National Fish and Wildlife Foundation, the National Council for Air and Stream Improvement, the Wildlife Conservation Society, Davis Conservation Foundation, Fuller Foundation, Sweet Water Trust, Wilma K. Wilensky, Lynx System Developers, Defenders of Wildlife, Maine Forest Products Council, and the Cooperative Forest Research Unit .

--Jennifer Vashon

White-Nose Syndrome in Bats

Over the last four years it is estimated that over a million bats have died from the disease white-nose syndrome (WNS). WNS refers to a white fungus around the nose of affected bats. Until recently, researchers did not know if the fungus was the primary pathogen affecting the bats or a secondary symptom. In 2009, the fungus *Geomyces destructans* was identified as the causative agent of the disease. WNS causes hibernating bats to awaken more often during hibernation and prematurely use up fat reserves needed to survive the winter. This disease was first discovered in bats hibernating in a cave in New York State and in a very short time has spread throughout most of the northeast and as far west as Oklahoma.

This past winter and spring, Maine's hibernacula were surveyed extensively for signs of WNS. Maine only has a few winter hibernacula (typically caves or mines where groups of bats hibernate). As of April 2010, no evidence of WNS was found, which is fortunate considering that several caves in New Hampshire are infected by WNS. Although the disease has not been found in Maine, it likely has affected Maine bats that migrate to other states to hibernate in the winter. In cooperation with collaborators we continue to monitor the health of bats in Maine. Additional research is needed to find control and treatment methods for the disease.

--John DePue and Wally Jakubas

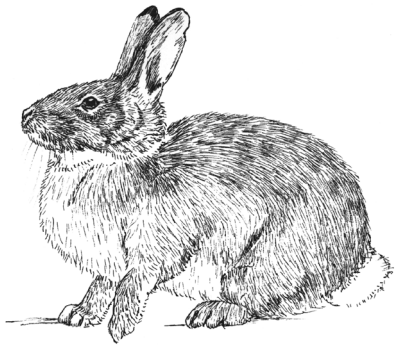
New England Cottontail

The New England cottontail (NEC; *Sylvilagus transitionalis*) or cooney is Maine's only endangered terrestrial mammal, and is a candidate for listing under the federal Endangered Species Act. The decline in the NEC population has been attributed to habitat loss, in particular, the loss of old fields and shrubby habitat. Most people have a hard time believing that an animal that "breeds like a rabbit" could become endangered. The fact that a species with a high reproductive rate like the NEC is endangered begs the question -- if New England's only native cottontail is endangered, what does it say about the status of other wildlife that live in brushy / early successional habitats or the heath of the ecosystem they live in? In 2003, IFW along with the cooperation of biologists at the University of New Hampshire (UNH) and the US Fish and Wildlife Service (USFWS), identified 53 sites where NEC occurred in Maine and estimated that roughly 350 cottontails existed in the state. Subsequent winter track surveys, and genetic analysis of fecal pellets collected during those surveys, revealed that the range of NEC has contracted further to the south since 2003. Today, NEC exist in three distinct populations in Maine, with populations in 1) Cape Elizabeth / Scarborough, 2) Wells, and 3) Kittery/York/Elliot. These populations are separated by considerable distances and by a landscape that is fragmented by roads and unsuitable habitat. The fragmentation of this habitat acts as a barrier to the movements of rabbits and prevents the mixing of these populations. As populations become smaller and their genetic diversity decreases, they have a higher risk of going extinct.

Our Department is working closely with a host of governmental and non-governmental organizations to try to restore Maine's NEC population and the ecosystem they live in. Our current focus is on securing additional habitat, habitat restoration, and NEC propagation. In cooperation with the USFWS, Environmental Defense, and the Wildlife Management Institute we are working to identify state and private lands that would be suitable for NEC management. Kelly Boland, the NEC Restoration Coordinator, works with landowners who are interested in creating and maintaining habitat for NEC, and assists IFW and the USFWS on our habitat restoration efforts. Shortly, we hope to begin an aggressive program of habitat restoration in which the Wildlife Management Institute will be a key player.

The Department, in cooperation with the Kennebunkport Conservation Trust, is attempting to propagate NEC on an island owned by the Trust. This island has some of the best habitat in the state for NEC and has a lower predator density than mainland areas. In March 2010, the Department relocated 15 NEC from the Portland International Jetport to the island. Safety improvements at the Jetport necessitated removing about 8 acres of NEC habitat near one of the runways. Most of these rabbits were outfitted with radiocollars to allow us to monitor their survival on the island. Artificial burrows were constructed on the island to improve their survival, especially during inclement winter weather. Potentially, the rabbits released on the island could produce up to 75 offspring by the end of summer, if each female has 3 litters and averages 5 young per liter. We are monitoring the island with cameras to document offspring, and will estimate the island's population of rabbits in the fall using a mark-recapture technique. If this propagation effort is successful, rabbits will be translocated from the island to mainland areas that do not have NEC. The need to move rabbits off of the island makes it imperative that habitat restoration efforts get underway immediately. While we have identified a few potential sites to move the rabbits, it may take 5 or 6 years for other sites to become suitable for NEC. New Hampshire Fish and Game is also interested in propagating NEC, but will likely pursue an indoor captive rearing facility. Hopefully, the combined efforts of our agencies will ensure that there are ample NEC for our restoration efforts.

--Wally Jakubas



Reptile, Amphibian, and Invertebrate Group

The Wildlife Division expanded its commitment to the conservation of the full diversity of Maine's wildlife with the creation of a Reptile, Amphibian, and Invertebrate Group in 2005. Maine is home to 18 species of frogs and salamanders (amphibians), 16 species of turtles and snakes (reptiles), and over 16,000 species of terrestrial and freshwater invertebrates, from beetles and butterflies to mayflies and mussels, to name just a few. Coordinating survey, research and conservation priorities for such a diverse suite of organisms is challenging! One of the Group's highest priorities is to address the protection and recovery needs of the large number of reptiles and invertebrates currently on the state's official list of Endangered and Threatened species (21 of 46 species). Some state endangered invertebrates, such as the Katahdin Arctic Butterfly and Roaring Brook Mayfly, are state or regional endemics – found nowhere else in the world but in Maine or a small area of the Northeast. The Reptile, Amphibian, and Invertebrates Group works to ensure that these and other less familiar but ecologically important species remain a part of Maine's rich natural heritage.

Phillip deMaynadier, Wildlife Biologist and Group Leader – Phillip supervises Group activities and serves as the Department's lead biologist on issues related to the conservation of amphibians, vernal pools, butterflies, damselflies, and dragonflies.

Beth Swartz, Wildlife Biologist – Beth serves as the Department's lead biologist on aquatic invertebrate issues, with recent efforts devoted to the survey and conservation of Clayton's Copper butterfly, freshwater mussels, and rare mayflies. Beth is also currently helping the Department address vernal pool data review and management.

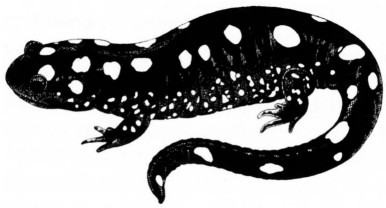
Jonathan Mays, Wildlife Biologist – Jonathan brings professional experience working with a diversity of reptile, amphibian, and invertebrate species. Currently Jonathan serves as the Department's lead biologist on reptile issues where he coordinates survey and research on several rare turtle and snake species. Jonathan is also coordinating efforts to document the distribution and status of all reptiles, amphibians, spiders, snails, and tiger beetles.

Reptile, Amphibian, and Invertebrate Conservation and Management

Amphibians and Reptiles

Partners in Amphibian and Reptile Conservation

MDIFW continues to cooperate with an initiative entitled Partners in Amphibian and Reptile Conservation (PARC). Modeled partly after the successful Partners in Flight (PIF) bird conservation program, PARC's mission is to forge partnerships among diverse public and private organizations in an effort to stem recent declines of amphibian and reptile populations worldwide. MDIFW regularly participates in northeastern chapter PARC meetings where discussions focus on conservation initiatives for amphibians, reptiles, and habitats of regional conservation concern. MDIFW helped host and coordinate the PARC-Northeast annual meeting in Winter Harbor in August of 2010. To date, PARC-Northeast has made progress on drafting model state regulations, compiling a list of regional species of conservation concern, and publishing management recommendations for habitats of special importance to northeastern amphibians and reptiles. For more information on national PARC conservation efforts, or to join the northeastern chapter, visit the PARC website at www.parcplace.org.



Funding for this work comes from Loon Conservation Plate and Chickadee Check-off funds.

--Phillip deMaynadier and Jonathan Mays

Maine Amphibian and Reptile Atlas Project (MARAP)

From 1986-1990, MDIFW, in cooperation with Maine Audubon and the University of Maine, conducted the Maine Amphibian and Reptile Atlasing Project (MARAP). During a four-year period, over 250 volunteers from around the state contributed approximately 1,200 records of observations of amphibians and reptiles. This initiative culminated in the 1992 publication of the book *The Amphibians and Reptiles of Maine.* The first edition sold out within two years of publication.

By 1998, considerable new data had been compiled and there was increasing demand for updated information on the state's amphibians and reptiles. Editors Malcolm Hunter, Jr., Aram Calhoun, and Mark McCollough revised a second edition, incorporating information from 1,300 new records into updated range maps and species narratives, and added color photographs and a CD of the calls of the frogs and toads of Maine. Copies of the updated 1999 edition of *Maine Amphibians and Reptiles* can be ordered for $19.95 from the Information Center, MDIFW (207-287-8000).

MDIFW continues this atlasing work and maintains a comprehensive database on the distribution of Maine's 34 amphibian and reptile species. Though most of this work is opportunistic, as of Spring 2010 over 6,000 entries from nearly 600 volunteers have been logged. There is much still to learn regarding the distribution and ecology of Maine's herptofauna and we encourage members of the public to share their observations and photographs by submitting a MARAP reporting form (Figure 2). **Please submit observations of any of the four state-listed reptiles – Eastern Box Turtle (Endangered), Blanding's Turtle (Endangered), Spotted Turtle (Threatened), and Black Racer (Endangered) -- to MDIFW immediately (jonathan.mays@maine.gov or call 207-941-4475).**

Funding for this work comes from Loon Conservation Plate and Chickadee Check-off funds.

-- Jonathan Mays and Phillip deMaynadier

Maine Amphibian & Reptile Atlasing Project (MARAP) Report Card

SPECIES OBSERVED (describe field marks below):	Photo		Handled		Observed		Heard (frogs only)		ID Confidence (%)
	Yes	No	Yes	No	Yes	No	Yes	No	

DATE: ____ / ____ / ____ (YEAR / MONTH / DAY)

TOWNSHIP: _____

COUNTY: _____

SITENAME: _____

DELORME Map Page & Grid (e.g., 02B3): _____

PRINCIPAL OBSERVER:

Name _____

Address _____

City/State/Zip _____

Phone _____

Email _____

ADDITIONAL OBSERVERS: _____

LOCATION (be specific, reference mapped landmarks, when possible include GPS coordinates):

HABITAT DESCRIPTION:

NOTES (Description, # observed, Behavior, Age, Sex):

Return this form and labeled photos to:

MARAP: Reptile, Amphibian, & Invertebrate Group
Department of Inland Fisheries & Wildlife
650 State Street, Bangor, ME 04401

or email

jonathan.mays@maine.gov
or
phillip.demaynadier@maine.gov

Figure 2. Maine Amphibian and Reptile Atlas Project (MARAP) Record Card.

Amphibian Monitoring

Since 1989, scientists have been concerned that frogs, toads, and salamanders (amphibians) may be declining worldwide. Unfortunately, a recent scientific analysis confirms these suspicions with fully 32% of the world's amphibian species now considered threatened with extinction, a rate exceeding that for birds or mammals. Maine, like many other states, had little data to assess trends in its own amphibian populations. In 1996, MDIFW and Maine Audubon received an Outdoor Heritage Fund grant to initiate a statewide amphibian-monitoring program, which was launched in 1997. Maine's Calling Amphibian Survey is part of a nationwide effort organized by the U.S. Geological Survey. Sixty-one road-monitoring routes were randomly established across the state. Each spring and summer season, volunteers drive their individually assigned route three times, recording the diversity and intensity of calling frogs and toads. Several vacant routes still exist, with new volunteers especially needed in northern Maine. Participants are provided training materials to assist them with the identification of each of Maine's nine species of frogs and toads. With 13 years of data collected (through 2009), we anticipate the ability to analyze preliminary population trends for several species of frogs and toads soon. Currently Leopard Frogs (Special Concern), Pickerel Frogs, and Mink Frogs are among the state's least commonly reported species. Those interested in participating in this citizen-science initiative should contact Maine Audubon's Susan Gallo at 207-781-6180 (ext. 216) or visit the website at: www.maineaudubon.org/conserve/citsci/mamp.shtml.

Funding for this work comes from Maine Audubon Society, Loon Conservation Plate, and Chickadee Check-off funds.

--Phillip deMaynadier

Rare Snakes
Maine is currently home to at least nine species of snake, one of which is state Endangered (Northern Black Racer) and two of which are state Special Concern (Ribbon Snake and Brown Snake). The Timber Rattlesnake, was historically native but is now thought to be extirpated from the state. The Maine Amphibian and Reptile Atlasing Project (MARAP) continues to provide location records for all snakes, but more detailed research is needed in order to assess movements, habitat requirements, and potential threats to our rare snakes.

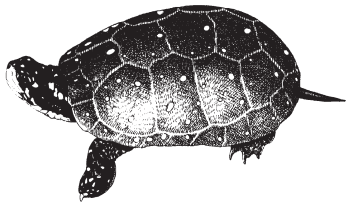
To determine home range size, over-wintering sites, and habitat use, MDIFW conducted a radio telemetry project on Black Racers in southern Maine. Racers are long, slender snakes, jet black in color with a white chin/throat and gray belly. Black Racers reach the northern extent of their range in southern Maine. At present, less than 30 sites in Maine are known to host Black Racers and only six of those locations have had racers observed at them within the last five years. Fourteen racers were implanted with radio transmitters and data analysis has shown that these animals are using very large home ranges in early successional habitat (approximately 100 contiguous hectares of predominantly scrub/shrub habitat and surrounding grasslands and open forests). Field herpetologist Trevor Persons and MDIFW's veterinarian Dr. Russell Danner were both instrumental in this project. In addition, Parker Schuerman and Jon Bailey (Southern Maine Land Stewards with The Nature Conservancy) along with other generous land owners continue to provide access, project support, and continued management to maintain habitat that benefits Black Racers. Knowledge gained from this study is informing protection efforts and habitat management of Maine's longest and fastest reptile.

Historically, snakes have been misunderstood, feared, and even persecuted. Many have stated that snakes are among the least appreciated of Maine's wildlife. While this may be true, snakes fill an important place in the environment and provide balance: preying on small mammals, insects, and other reptiles and amphibians, and providing food for various predatory birds and mammals. Snakes are fascinating creatures and our state is certainly richer with them here.

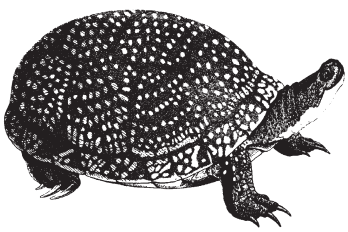
Funding for this work comes from U.S. Fish and Wildlife Service, Maine Department of Transportation, Loon Conservation Plate, and Chickadee Check-off Funds.

--Jonathan Mays

Rare Turtles
Over the past 18 years, MDIFW has actively researched the distribution and status of Blanding's and Spotted Turtles in Maine. Blanding's Turtles (Endangered) are 7 to 10 inches long with a yellow throat and light colored flecking on a helmet shaped shell. Spotted Turtles (Threatened) are 5 to 6 inches in length, have yellow spots on the head, tail, and legs and a somewhat flat, yellow spotted shell. Both species are semi-aquatic preferring small, shallow wetlands in southern Maine including pocket swamps and vernal pools. Undeveloped fields and upland forests surrounding these wetlands provide habitat for nesting, estivating (a period of summer inactivity), and inter-wetland movements.



Despite the attention these turtles have received, habitat loss and fragmentation continue to threaten both species' viability in Maine. As the human population expands, road mortality becomes an ever increasing threat. The turtle's shell has provided sufficient protection from predators for millions of years, but unfortunately is no match for a car tire. Both Blanding's and Spotted Turtles are long-lived animals that take a minimum of 7 (Spotted) to 14 (Blanding's) years to reach reproductive age. This, coupled with low hatching success, places all the more importance on adult survivorship. Recent population analyses of several freshwater turtle species indicate that as little as 2-3% additive annual mortality of adults is unsustainable, leading ultimately to local population extinction. In other words, losing just a few breeding adult turtles each year to road kill may be the greatest factor threatening the extinction of Blanding's and Spotted Turtles in Maine. To this end, MDIFW and the University of Maine initiated a cooperative research project in 2004 to investigate the significance of road mortality to rare turtles in southern Maine. Frederic Beaudry, after radio-tagging 91 turtles (50 Blanding's and 41 Spotted) over three field seasons, successfully completed his research in southern Maine. Fred's work looked at the nature, extent, and frequency of overland movements of Blanding's and Spotted Turtles, the road mortality risk associated with their movements, and the consequences of this mortality on the population viability of both species. One of his results was the discovery that Blanding's Turtles use on average 6-7 unique wetlands within a single season (one individual male Blanding's Turtle used 20!). MDIFW is currently working with cooperators – including Maine Department of Transportation, The Nature Conservancy, and local towns – to apply results from this research toward managing areas with a high number of turtle road crossings (e.g., using cautionary signage).



Active habitat protection is critical for the preservation of Blanding's and Spotted Turtles in southern Maine. MDIFW is committed to working with landowners and towns to help conserve remaining large blocks of habitat needed to sustain viable populations of these rare turtles. Southern Maine's landscape is rapidly developing, and some of the best remaining populations of Blanding's and Spotted Turtles can be found on a 35,000 acre area surrounding Mt. Agamenticus in York County. MDIFW is working closely with the Mt. Agamenticus Conservation Coalition – including the U.S. Fish and Wildlife Service, The Nature Conservancy, local land trusts, water districts, and towns – to protect habitat

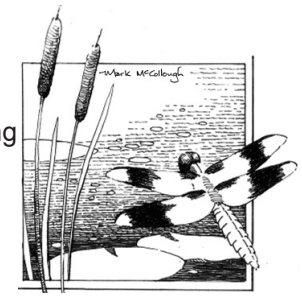
for turtles and other rare species in this area, one of the largest remaining contiguous coastal forest ecosystems between Acadia National Park and the New Jersey Pine Barrens. To learn more about progress on habitat conservation in the Mt. Agamenticus area visit: http://www.agamenticus.org/

Funding for this work comes from Loon Conservation Plate, Chickadee Check-off funds, U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, Maine Department of Transportation, The Nature Conservancy, and the Maine Outdoor Heritage Fund.

-- Jonathan Mays and Phillip deMaynadier

Invertebrates

Rare Dragonflies



Insects in the order Odonata, damselflies and dragonflies, are a conspicuous component of Maine's wildlife diversity. Presently, 158 species have been documented in the state, comprising nearly 36% of the total North American fauna. Several of Maine's odonate species are of national and global conservation concern. Maine currently lists three species as Endangered or Threatened and fully 25 species as Special Concern. While several odonates are highly sensitive to freshwater habitat degradation, baseline information for the group had been lacking in Maine, until recently.

In 1998, MDIFW initiated the Maine Damselfly and Dragonfly Survey (MDDS), a multi-year, citizen scientist atlasing initiative designed to improve our knowledge of the distribution, status, and habitat relationships of damselflies and dragonflies statewide. In addition to accumulating a tremendous amount of data, the MDDS engaged over 200 of Maine's non-game enthusiasts and raised public awareness of invertebrate conservation generally. To our knowledge, the MDDS is among the first completely state-sponsored dragonfly atlasing projects of its kind in North America and has received considerable notoriety (visit: http://mdds.umf.maine.edu/~odonata/). Having completed its final "official" field season in 2003, the survey's results exceeded expectations and are best summarized by the following:

Public Outreach and Involvement:

Volunteer participation statewide:	>200
Volunteers trained in MDDS seminars:	95
Major press articles covering the MDDS project:	5
Website hits (http://mdds.umf.maine.edu/~odonata/)	>20,000

Scientific Contributions:

Total records submitted (% increase over 1999 baseline):	17,264 (229%)
New state species records:	10
New U.S. species records (Quebec Emerald & Canada Whiteface):	2
Scientific publications completed or in progress:	5

With the volunteer atlasing component of the MDDS project coming to closure, MDIFW recently contracted Paul M. Brunelle, an odonate expert and graphic design artist from Nova Scotia, to assist with authoring and designing the project's capstone product: *An Atlas and Conservation Assessment of Acadia's Damselfly and Dragonfly Fauna*. Populated largely with data contributed by MDDS volunteers, this atlas will serve as the first authoritative publication on the distribution and natural history of odonates from Maine and the Canadian Maritime Provinces.

Funding for this work comes from Loon Conservation Plate, Chickadee Check-off funds, U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, and the Maine Outdoor Heritage Fund.

--Phillip deMaynadier

Rare Butterflies

Hessel's Hairstreak, Purple Lesser Fritillary, and Crowberry Blue are just some of the state's rarest butterflies that are both colorful in name and on the wing. In an effort to improve our knowledge of these and other rare butterflies MDIFW is actively studying the group during statewide regional surveys. Attractive, conspicuous, and ecologically important, butterflies have garnered increasing attention from scientists and the general public. By documenting the distribution and status of the state's butterfly fauna MDIFW hopes to improve its understanding of the group and prioritize conservation efforts towards those species most vulnerable to state extinction.

Further supporting this goal, MDIFW received a grant from the Outdoor Heritage Fund in 2002 to contract a professional lepidopterist, Dr. Reginald Webster from New Brunswick, to help assemble a comprehensive assessment of the state's butterfly fauna. Drawing from published literature and specimen records located in museums and amateur collections throughout the Northeast, Reggie helped MDIFW assemble the first baseline atlas and database of Maine's butterfly fauna – an essential step toward conservation and management of the group. The baseline atlas project compiled nearly 9,000 records and added 11 previously undocumented butterflies to the state list, which now stands at 120 species. Of special note is the relatively high proportion (~20%) of Maine butterflies and skippers that are extirpated (5 species) or state-listed

as Endangered, Threatened, or Special Concern (19 species), a pattern consistent with global trends elsewhere for the group. Contact MDIFW to receive an updated checklist of the butterflies of Maine (phillip.demaynadier@maine.gov) or visit http://www.state.me.us/ifw/wildlife/wildlife.htm to download a pdf copy of Maine's first baseline butterfly atlas.

Finally, we are pleased to announce that a statewide volunteer butterfly atlas took flight in 2007. Sponsored by MDIFW, in partnership with the University of Maine at Farmington (Dr. Ron Butler), Colby College (Dr. Herb Wilson), and Dr. Reginald Webster of New Brunswick, the Maine Butterfly Survey (MBS) is a 6-year, statewide, volunteer survey effort. Following in the tradition of previously successful state-sponsored wildlife atlasing projects, including most recently the Maine Damselfly and Dragonfly Survey, data generated from the MBS comes primarily from citizen scientists. The survey will help fill information gaps identified during the baseline assessment (above) on butterfly distribution, flight seasons, and habitat relationships for one of the state's most popular insect groups. The next state-sponsored training workshop for new MBS volunteers is currently scheduled for spring 2011; check the MBS website for further details (http://mbs.umf.maine.edu) or contact the volunteer coordinator, Dr. Herb Wilson, at whwilson@colby.edu.

Funding for this work comes from Loon Conservation Plate, Chickadee Check-off funds, The Nature Conservancy, U.S. Fish and Wildlife Service, and the Maine Outdoor Heritage Fund.

--Phillip deMaynadier

Clayton's Copper Butterfly

The Clayton's Copper (*Lycaena dorcas claytoni*) is a small, orange-brown butterfly known only from a handful of sites in Maine and western New Brunswick. It is found only in association with its single larval host plant, the Shrubby Cinquefoil. This uncommon shrub has a scattered distribution in Maine and rarely occurs in stands large enough to support viable populations of the butterfly. Where it grows best is along the edges of calcareous wetlands (i.e., rich in calcium carbonate or limestone), which are a rare habitat type in Maine. Not found everywhere its host plant grows, the Clayton's Copper is even rarer – with only nine occurrences currently documented in the State.

This butterfly takes one year to complete its life cycle. In late July and August, when shrubby cinquefoil is blooming, females lay their eggs singly on the underside of cinquefoil leaves. Leaves and eggs drop to the ground in autumn, and the eggs overwinter. The pale green larvae hatch in spring and crawl back up the plant to feed on its leaves. After the larvae molt and pupate in early summer, adult butterflies emerge during July and August to start the cycle over again. Throughout the flight period, Clayton's Copper remains local to its cinquefoil stands, where the abundant yellow flowers provide its primary nectar source.

Clayton's Copper is listed as Endangered in Maine because of the extremely limited number, size, and distribution of its populations; the rarity of its habitat, and its near-endemic status (i.e., limited to Maine and New Brunswick). In 2009, MDIFW continued its partnership with the University of Maine to investigate key life history and conservation questions about this rare butterfly. Under the guidance of Drs. Judith Rhymer and Frank Drummond, UMO graduate student Emily Knurek completed her research to estimate the butterfly's population size and habitat extent at each of the state's occurrences. As a result of Emily's work, MDIFW now has baseline population and habitat data that will be critical for assessing the species' true status and recovery potential. Emily also completed an investigation of the butterfly's taxonomic status. While most lepidopterists have accepted that Clayton's Copper is an isolated subspecies of the more widely distributed Dorcas Copper (*Lycaena dorcas*), the taxonomic distinction between the two has never been quantified. By performing detailed morphological and genetic analyses, Emily was able to determine that Clayton's Copper is a true subspecies, thus confirming its conservation significance in Maine.

Also in 2009, two new UMO graduate students initiated cooperative research projects with MIDFW to follow up on Emily's work and investigate some new areas of Clayton's Copper life history and status. Corrine Michaud, also working with Dr. Rhymer, is looking at the genetic structure of Clayton's Copper populations in Maine; gathering basic life history information; and analyzing the quality and selection characteristics of the butterfly's host plant (shrubby cinquefoil). Under the guidance of Dr. Cyndy Loftin, Sarah Drahovzal is researching some of the specific characteristics of the circumneutral fen (wetland) habitats where the Clayton's Copper butterfly is found.

Funding for this work comes from the U.S. Fish & Wildlife Service, University of Maine, The Nature Conservancy, American Philosophical Society, Maine Outdoor Heritage Fund, Loon Conservation Plate, and Chickadee Check-off funds.

--Beth Swartz

Rare Tiger Beetles

Tiger beetles are handsome, active insects that make their living running down smaller insect prey on the ground. These terrestrial beetles move so fast that they outrun their eye sight and often have to pause to refocus – a behavior that aids in quick identification of this group in the field. Though many are dark colored and camouflage nicely with their preferred sandy or mud habitat, some species can be quite striking in appearance with iridescent colors or intricate body patterns. Maine is home to 13 species of tiger beetles, three of which are considered state "Special Concern" due to their limited range and specialized habitat requirements.

As part of on-going ecoregional surveys in the Central and Western Mountains, MDIFW conducted surveys for the White Mountain Tiger Beetle (Special Concern) in 2009. Several new location records were gleaned and much was learned in regard to adult flight times and habitat use for this species but perhaps the most notable discovery was the Cobblestone Tiger Beetle — a new species for the state of Maine. This species with its distinctive marking pattern and orange abdomen is considered globally imperiled (G2) and ranked critically endangered (by NatureServe) in New Hampshire, New Jersey, New York, Pennsylvania, and Vermont. In Canada, this beetle is known from only a few sites in New Brunswick where it is listed Endangered by the Committee on the Status of Endangered Wildlife in Canada. The newly discovered Maine population fills a critical distribution gap and offers additional hope for this species' recovery. As the name implies, the Cobblestone Tiger Beetle prefers cobble bars on vegetated islands in medium to large rivers. It appears these rivers need to be un-dammed to allow natural, seasonal scouring of the cobble beaches but not prolonged flooding. Due to an apparently limited range (at present an 8 km stretch of a single river) and seemingly specialized habitat, the Cobblestone Tiger Beetle was recently listed state Special Concern in Maine but is a strong candidate for future state Endangered/ Threatened status. Additional surveys are underway to assess the true distribution and status of this new addition to Maine's tiger beetle fauna.

Funding for this work comes from the Maine Outdoor Heritage Fund, U.S. Fish and Wildlife Service, Loon Conservation Plate, and Chickadee Check-off funds.

--Jonathan Mays

Rare Mayflies

Two species of mayflies are currently protected by Maine's Endangered Species Act. The Tomah Mayfly, which is listed as Threatened, is a unique insect once thought to be extinct. It was rediscovered in Tomah Stream (Washington County) in 1978 and is now known to be extant at about 21 sites in Maine and at least one site in New York. The nymphal stage of the Tomah Mayfly, unlike other species of mayflies, is carnivorous - preying largely upon other mayfly nymphs. This species depends on highly productive, seasonally-flooded, sedge meadows along large streams or rivers to complete its life cycle. Although sedge meadows are not an uncommon habitat type in Maine, the Tomah Mayfly is found at only a small number of sites. In 2009, MDIFW completed limited surveys for this species in central and western ecoregions and was able to document one new population.

The Roaring Brook Mayfly is listed as Endangered in Maine. First discovered in 1939 on Mt. Katahdin, this species was not reported again until MDIFW rediscovered it in 2003. Found in two small tributaries of Roaring Brook, it was originally believed to occur nowhere else in the world but Mt. Katahdin. Recently, however, one specimen was found in a collection from the Green Mountains of Vermont and another from the White Mountains of New Hampshire. Additional surveys by MDIFW in 2007 – 2009 documented five new sites in the mountains of western Maine; and a sixth site was found by other surveyors. This rare mayfly appears to be restricted to undisturbed, high-elevation headwater streams along the northern Appalachian Mountain Range, and may be New England's only endemic mayfly.

In addition to these two listed species, 13 other mayflies are considered Special Concern in Maine. As part of the Department's ongoing surveys for rare species, MDIFW continues to look for new occurrences of these uncommon insects in order to better understand their status and conservation needs.

Funding for this work comes from the Maine Outdoor Heritage Fund, U.S. Fish and Wildlife Service, Loon Conservation Plate, and Chickadee Check-off funds.

--Beth Swartz

Freshwater Mussels

Freshwater mussels are relatively sedentary, bottom-dwelling invertebrates found in most of Maine's lakes, ponds, rivers, and streams. Often referred to as a "clam," the freshwater mussel's inconspicuous and seemingly drab lifestyle belies its importance. As filter-feeders, mussels provide a valuable service to aquatic environments by filtering suspended particles such as algae, bacteria and detritus from the water, and by returning nutrients to the ecosystem. In turn, mussels provide food for a variety of wildlife such as muskrats, raccoons, and otters.

Freshwater mussels also have a rather unique and interesting life cycle. They start life as free-floating larvae, called "glochidia", which are quite different in appearance from the adults. The glochidia of most species must attach to a specific fish host in order to mature into the more familiar adult form. Once the tiny mussels have dropped off their mobile nurseries (they do no harm to the fish) and burrowed into the substrate, they often remain in the same spot for their entire lives. For some species, a lifetime can span 100 years or more.

Habitat integrity is an important factor influencing mussel survival. Freshwater mussels are sensitive to contaminants and changes in their environment - a vulnerability compounded by specific habitat and fish host requirements, and an inability to leave their surroundings. Consequently, they are one of our most valuable indicators of water quality and aquatic ecosystem health. They are also one of the most imperiled groups of animals in the country. Of the nearly 300 species of freshwater mussels found in the United States, more than a third have already vanished or are in danger of extinction, and over 75% are listed as Endangered, Threatened, or Special Concern at the state level. These dramatic declines have been caused largely by the degradation and loss of mussel habitat from pollution, dams, and the channelization

and sedimentation of our once clean, free-flowing rivers and streams. Poaching of shells for sale to the Orient's pearl culture industry, and the recent invasion of a prolific foreign competitor, the Zebra Mussel, are also jeopardizing many populations.

Maine's freshwater mussel fauna has fared relatively better than that of many states. We haven't lost any species, our freshwater habitats are reasonably clean, and the zebra mussel has not yet found its way into our waterways. However, we are not immune to the problems of habitat loss and degradation that have eliminated populations and extirpated species in other parts of the country. Of our 10 native species, three (Yellow Lampmussel, Tidewater Mucket, Brook Floater) are currently listed as Threatened under the Maine Endangered Species Act and one (Creeper) is considered of Special Concern. Fortunately, compared to most states within the range of these species, Maine hosts some of the best remaining populations and may be a last stronghold for these rare mussels.

In 2009, MDIFW continued surveys to document new occurrences for rare mussels in three ecoregions of central and western Maine. As a result, one new location for the Tidewater Mucket was discovered and several new riverine occurrences for all four rare species were located between previously documented populations. MDIFW also coordinated a study to better assess the status of the Brook Floater in eight rivers of southern and midcoast Maine, where populations are isolated and at-risk from habitat degradation by surrounding land use. Unfortunately, the study revealed a significant decline in numbers and habitat quality in southern Maine's only known Brook Floater population in the Pleasant River (Cumberland Co.), where extensive bank erosion and sedimentation have severely degraded habitat and likely resulted in mussel mortality. Maine's two midcoast populations in the Sheepscot (mainstem and West Branch) and St. George Rivers may also be in trouble, with either very low densities or populations comprised largely of older animals and little evidence of successful reproduction. In 2010, MDIFW plans to continue surveys in the Pleasant and Sheepscot Rivers to fully document the Brook Floater's status, threats, and conservation needs in these southernmost populations.

Eastern Pearlshell (*Margaritifera margaritifera*)	
Eastern Elliptio (*Elliptio complanata*)	
Triangle Floater (*Alasmidonta undulata*)	
Brook Floater (*Alasmidonta varicosa*)	**THREATENED**
Eastern Floater (*Pyganodon cataracta*)	
Alewife Floater (*Anodonta implicata*)	
Creeper (*Strophitus undulatus*)	**SPECIAL CONCERN**
Yellow Lampmussel (*Lampsilis cariosa*)	**THREATENED**
Eastern Lampmussel (*Lampsilis radiata radiata*)	
Tidewater Mucket (*Leptodea ochracea*)	**THREATENED**

Table 13. Freshwater Mussels of Maine

In 2009, the Department also continued to work closely with two dam removal projects to ensure impacts to rare mussels would be minimized or avoided. The Penobscot River Restoration Project seeks to remove two hydropower dams on a 5½ mile stretch of the Penobscot where all four listed mussels occur. In Waldo County, the Atlantic Salmon Federation and its partners are working to restore fish passage on Marsh Stream by removing the West Winterport Dam – which could potentially impact a population of Brook Floaters below the dam, but also improve habitat for mussels above the dam. MDIFW biologists are helping to coordinate plans for mussel recovery and post-monitoring when the dams eventually come out. Proposals to remove hydropower dams are increasingly common in Maine, and occasionally impact rare species found in the impoundments or below the dams. When a dam is removed where rare mussels are present, the primary conservation tools available to MDIFW are moving stranded mussels to safety and minimizing downstream sedimentation. This can be a daunting undertaking on projects where extensive areas of substrate are exposed as the water recedes. But through cooperation by everyone involved, a significant portion of the rare mussels can be recovered and relocated upstream – from where they may one day help repopulate the newly restored river section below.

More information on Maine's mussels (Table 13) can be found in *The Freshwater Mussels of Maine* (Nedeau et al. 2000), available through the Department's online store (http://www.mefishwildlife.com/) or Information Center (207-287-8000).

Funding for this work comes from the U.S. Fish and Wildlife Service, Loon Conservation Plate, and Chickadee Check-off funds.

--Beth Swartz

Special Habitats for Reptiles, Amphibians, and Invertebrates

Pitch Pine Woodlands and Barrens

Pitch Pine woodlands and barrens are lightly forested upland areas with dry, acidic, often sandy soils. Pitch pine, red pine, scrub oak, blueberry, huckleberry, and/or bluestem grasses are commonly among the sparse vegetation of this unique natural community. It's thought that over half of the state's original pine barren acreage has been lost to residential development, agriculture, and gravel mining. Many dry woodlands and barrens also require periodic fire to prevent succession to a more common, closed canopy white pine-oak system, a natural disturbance that is now short-circuited by habitat fragmentation and fire suppression.

Once viewed as unproductive “wastelands”, Maine’s few remaining pine woodlands and barrens are now recognized as areas of exceptional wildlife value, providing habitat for a variety of highly specialized plants and animals. Several rare and endangered species persist in the State’s few remaining intact barren communities, mainly in the towns of Kennebunk, Wells, Waterboro, Shapleigh, Hollis, and Fryeburg. These unique habitats are especially rich in rare lepidoptera (butterflies and moths), hosting species that feed on the specialized barrens vegetation, such as Edwards’ Hairstreak (Endangered), Sleepy Duskywing (Threatened), Cobweb Skipper (Special Concern), and Barrens Buck Moth (Special Concern). Other rare species associated with Maine’s barrens include Black Racers (Endangered), Grasshopper Sparrows (Endangered), Upland Sandpipers (Threatened), Short-eared Owls (Threatened), and Northern Blazing Star (a Threatened plant). To learn more about two barrens of statewide ecological significance visit “Focus Area Descriptions” on the Maine Natural Areas Program website (http://www.maine.gov/doc/nrimc/mnap/focusarea/index.htm), and select “Kennebunk Plains and Wells Barrens” or “Waterboro and Shapleigh Barrens” in York County.

Funding for barrens research and management comes from the Loon Conservation Plate, the Chickadee Check-off, and The Nature Conservancy.

--Phillip deMaynadier

Vernal Pools

Vernal pools are small, forested wetlands that frequently fill with water from early spring snowmelt and rains and then dry partly or completely by mid to late summer. Many of Maine’s amphibians use vernal pools as breeding or foraging habitat. Some, like Spotted Salamanders, Blue-spotted Salamanders, and Wood Frogs, breed more successfully in these fishless habitats than in any other wetland type. Additionally, vernal pools provide habitat for a variety of small mammals, wading birds, waterfowl, aquatic invertebrates, and several state-listed animal species including Blanding’s Turtles (Endangered), Spotted Turtles (Threatened), Wood Turtles (Special Concern), Ribbon Snakes (Special Concern) and Ringed Boghaunter dragonflies (Threatened).

We still have more to learn about why some vernal pools receive greater wildlife use than others. To this end, grants from the Maine Outdoor Heritage Fund and the U.S. Environmental Protection Agency helped support a University of Maine study by Dr. Robert Baldwin and Dr. Aram Calhoun to research the wildlife use and characteristics of vernal pools in York County. Rob and Aram’s results suggest that Wood Frogs and other pool-breeding amphibians range widely in the forested landscape following breeding and that surrounding upland forests and swamps provide important habitat outside of the brief pool-breeding season. Rob also developed a landscape model that highlights the vulnerability of vernal pools in southern Maine to habitat loss and fragmentation from insufficient conservation lands and wetland regulations.

MDIFW is currently cooperating with the Department of Environmental Protection and Conservation, Maine Audubon Society, and the University of Maine to identify potential strategies for protecting the unique values provided by smaller wetlands that “fall through the cracks” of current wetland regulations. Workshops on vernal pools continue to be held throughout the state for landowners and land managers, and several new publications designed to offer voluntary techniques for protecting vernal pools and their wildlife are now available. A vernal pool fact sheet, describing threats and management considerations, is available upon request from MDIFW for use by landowners, municipalities, land trusts, and other cooperators. The *Maine Citizen’s Guide to Locating and Documenting Vernal Pools* provides a comprehensive introduction to recognizing and monitoring vernal pools, including color photographs of the indicator species. Also available to the public are two complementary guide-books for protecting vernal pool habitat during timber management (*Forestry Habitat Management Guidelines for Vernal Pool Wildlife*) and development (*Conserving Pool-breeding Amphibians in Residential and Commercial Developments in the Northeastern United States*). Together, these publications provide recommendations designed to help maintain functioning vernal pool landscapes throughout Maine. All of the guides can be obtained by contacting Becca Wilson at Maine Audubon Society (207-781-6180 ext. 222; bwilson@maineaudubon.org).

Finally, the Departments of Inland Fisheries and Wildlife and Environmental Protection developed a definition of Significant Vernal Pools, a new Significant Wildlife Habitat under the state’s Natural Resource Protection Act, recently approved by the state legislature. Criteria for designating Significant Vernal Pools include a) the presence of a state Endangered or Threatened species, or b) evidence of exceptional breeding abundance by amphibian indicator species. Recognizing a subset of vernal pools as Significant will help state biologists provide guidance on development activities within a critical upland life zone surrounding one of the state’s highest value wildlife habitats.

Funding for MDIFW’s efforts at research and protection of vernal pools comes from the Loon Conservation Plate, the Chickadee Check-off, the U.S. Environmental Protection Agency, and the Maine Outdoor Heritage Fund.

--Phillip deMaynadier

Maine Department of Inland Fisheries and Wildlife

ROLAND D. MARTIN, COMMISSIONER
PAUL F. JACQUES, DEPUTY COMMISSIONER

Members of the Commissioner's Advisory Council

Cathy A. DeMerchant, Androscoggin, Kennebec, Sagadahoc Counties; telephone: 923-3287
Wade Kelly, Aroostook County; telephone: 398-4478
Richard Thurston, Cumberland County; telephone: 885-5441
Stephen Philbrick (Chair), Franklin, Oxford Counties; telephone: 864-3671
Frank M. Dunbar, Hancock County; telephone: 469-2667
Michael Witte, Knox, Lincoln, Waldo Counties; telephone: 677-2587
Alan Greenleaf, Penobscot County; telephone: 827-4888
John E. Simko, Piscataquis, Somerset Counties; telephone: 695-3430
Albion Goodwin, Washington County; telephone: 726-5574
Ron Usher (Vice-Chair), York County; telephone: 929-3474

Main Office: #41 State House Station, Augusta, Maine 04333-0041

For Administration, Fisheries and Wildlife, Warden Service,
general information about fish and wildlife, licenses, and
boating and recreational vehicle registration... call (207) 287-8000.

Check out our home page on the Internet at http://www.maine.gov/ifw.

Regional Headquarters
(Game Wardens and Biologists)
Ashland -- 435-3231
Gray -- 657-2345
Greenville -- 695-3756

Additional Regional Offices
(Biologists)
Sidney -- 547-5300
Enfield -- 732-4132
Jonesboro -- 434-5927
Strong -- 778-3324

If you cannot locate a Warden at the above numbers,
contact the nearest State Police barracks:

State Police Toll-free Numbers
Augusta 1-800-452-4664 / Houlton 1-800-924-2261
Orono 1-800-432-7381 / Gray 1-800-228-0857
Cellular Calls - 911

CONSERVATION PLATES
DO GREAT THINGS

Support Maine's State Parks and Endangered Wildlife!
Register your car or truck with Conservation License Plates.

Do a great thing for Maine today!

Conservation License Plate funds are administered by the Department of Conservation and the Department of Inland Fisheries and Wildlife