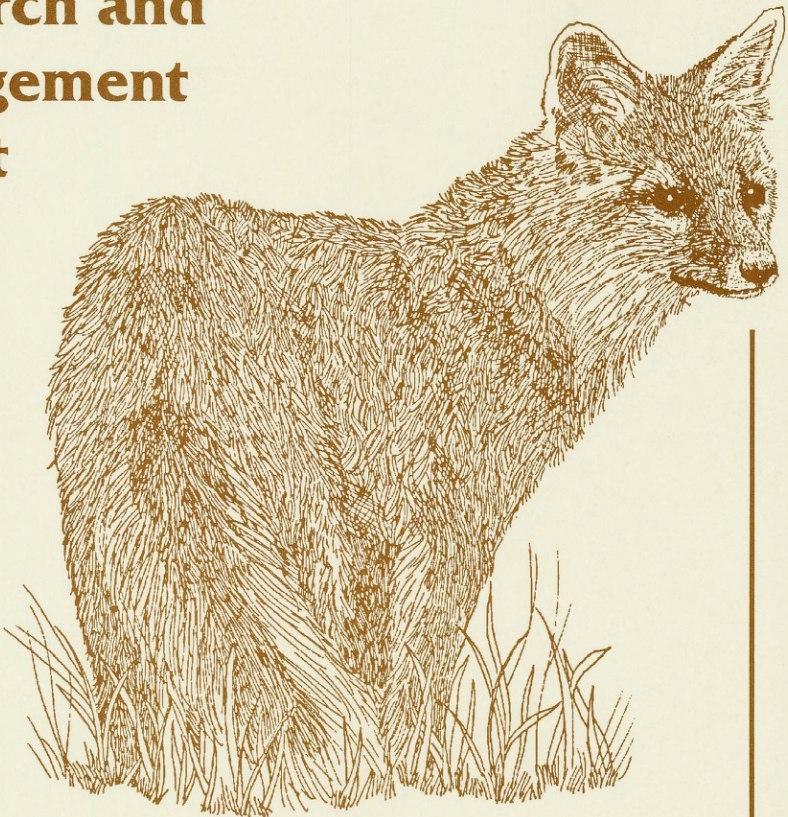


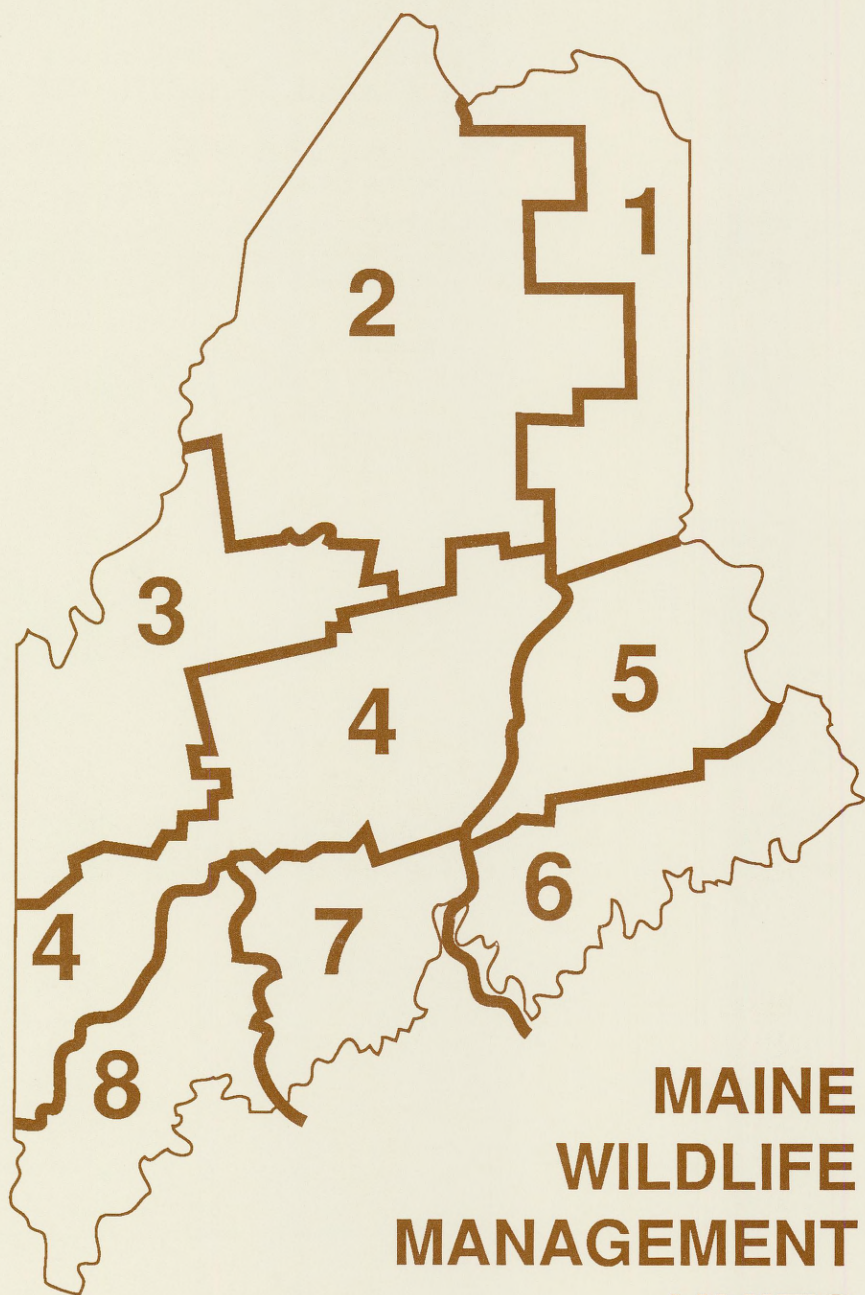
**Maine Department of
Inland Fisheries
and Wildlife**

Wildlife Division

**Research and
Management
Report
1989**



A Report to William J. Vail, Commissioner



**MAINE
WILDLIFE
MANAGEMENT
UNITS**

FOREWORD

As Maine continues to change, so do the programs carried out by the Department. Several years have elapsed since we published the last Wildlife Report — years of intensive activity and planning that have forged significant accomplishments and have altered the nature and scope of the wildlife program. Consequently, many new initiatives are being implemented. Some are designed to track the status of the more sensitive wildlife species, to identify their problems and needs, and to carry out measures that will maintain and enhance their population levels. This report highlights many of these initiatives as well as the status of our traditionally important furbearer and game species. We hope this information will lead you to a deeper understanding of Maine's wildlife resources, and the department's role in protecting their welfare, as together we seek to ensure wise stewardship of our wildlife heritage for future generations to utilize and enjoy.

William J. Vail
Commissioner

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INTRODUCTION

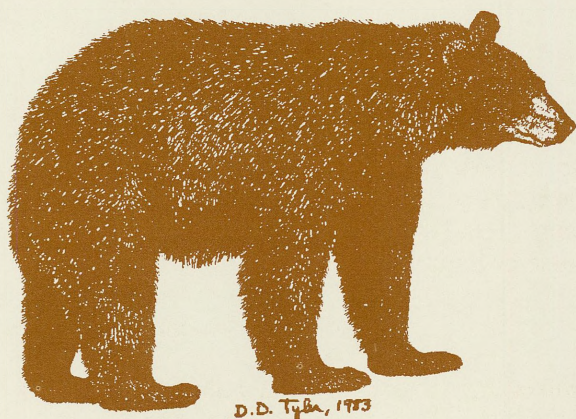
The past several years have been hectic ones in the Wildlife Division. We have expended considerable energy refocusing our research and management efforts to make the most efficient use of our resources.

Between 1983 and 1985, assessments were developed for each of the major wildlife species we are responsible for. These assessments documented knowledge of each species including an estimate of population size and carrying capacity. We also projected where we expected the population and habitat to be by 1990.

Each assessment was presented to a group of individuals, chosen from the public, who examined the information provided, asked probing questions, and then recommended population, harvest, and habitat goals and objectives for the species under consideration. These goals and objectives were presented to the Commissioner and his Advisory Council for final approval.

After assessments were completed, the Wildlife Division began developing Management Systems. These are simply documents detailing how we manage each species to ensure the goals and objectives are met. These systems are scrutinized by the entire Wildlife Division and also by professionals outside of the Department. We examine what kinds of data are collected, how they are collected, how they are analyzed and interpreted, and what management actions will be taken under different scenarios. These Management Systems are dynamic; they are constantly being monitored, and as new and better management techniques are identified, they are revised.

Although these planning endeavors have been long and arduous, they have been well worth the effort. They have helped us to clearly understand where we are headed and how we are going to get there.



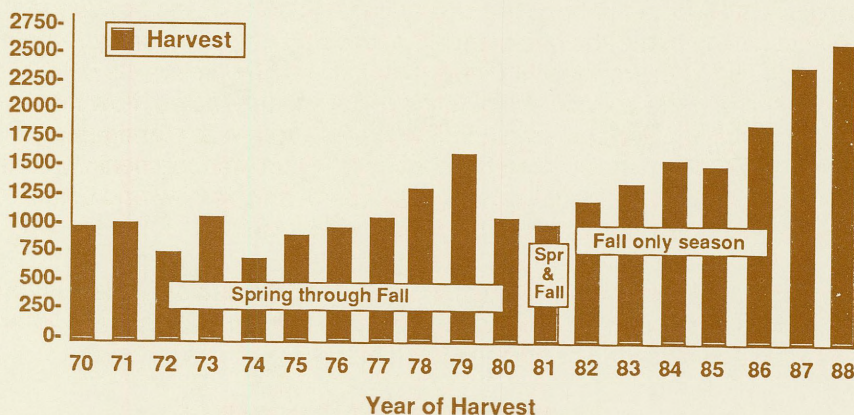
BLACK BEAR AND FURBEARERS

BLACK BEAR

1988 Bear Season

Maine's 1988 black bear season opened August 29 and closed November 30. Bears could be hunted over bait from August 29 until November 10, and hunted with dogs from September 1 through October 28. Bear trapping season opened September 1 and closed October 31. The 2,651 bears harvested during the 13.5-week season represented an 11% increase over 1987, when 2,394 bears were taken. Bear harvests have increased steadily since 1982, when the season was reduced from 5 1/2 months to the present 3-month fall period (Figure FB1).

Figure FB1. Maine bear harvests, 1970-1988.



Geographic Distribution of the Harvest

Bears were harvested in 11 of the State's 16 counties in 1988 (Table FB1). The greatest number of bears (876) was registered in Aroostook County, which yielded 33% of the statewide harvest, followed by Piscataquis County with 423 bears (16%). No bears were harvested in Androscoggin, Knox, Lincoln, Waldo or Sagadahoc counties.

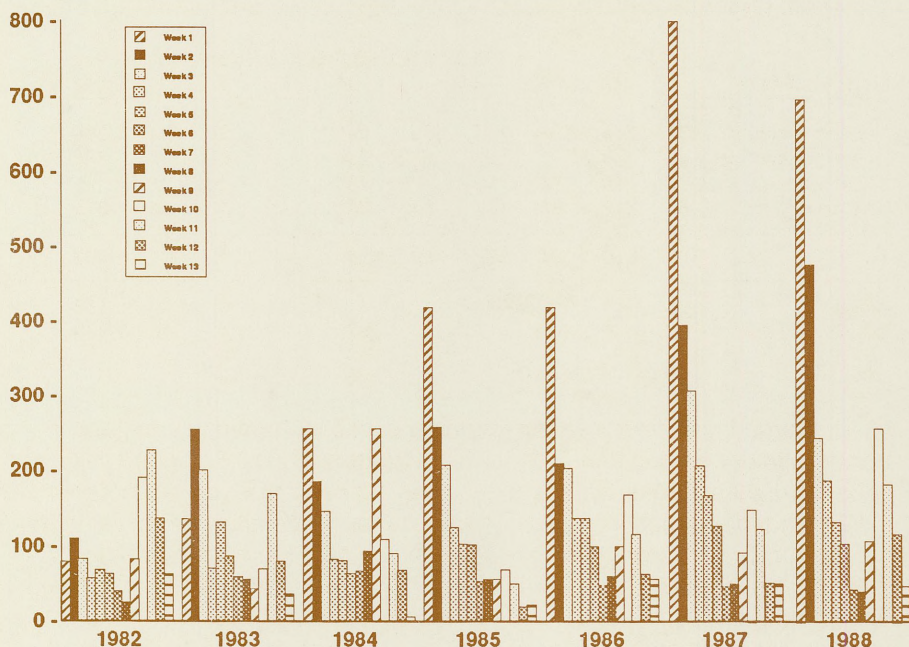
Timing of the Harvest

One fourth of the harvest occurred during the first week of the season, and 51% of the harvest was recorded within the first 3 weeks (Figure FB2). Har-

Table FB1. Maine bear harvests by county, 1982-1988.

County of harvest	YEAR						
	1982	1983	1984	1985	1986	1987	1988
Androscoggin	3	2	0	2	1	1	0
Aroostook	320	329	461	454	657	694	876
Cumberland	1	2	3	3	0	5	2
Franklin	64	86	94	112	123	151	133
Hancock	36	70	56	48	78	92	14
Kennebec	0	3	0	3	2	4	1
Knox	0	0	0	0	5	1	0
Lincoln	0	1	0	0	2	0	0
Oxford	67	88	111	90	125	158	195
Penobscot	197	310	200	265	228	322	310
Piscataquis	226	234	254	229	300	426	423
Sagadahoc	0	0	0	0	0	0	0
Somerset	182	176	241	197	268	315	298
Waldo	1	0	2	0	0	2	0
Washington	102	110	179	139	163	220	265
York	2	1	0	2	3	3	4
Unknown	2	0	0	0	0	0	0
Statewide	1,221	1,412	1,601	1,544	1,955	2,394	2,652

Figure FB2. Weekly composition of Maine bear harvests, 1982-1988.



vest rate slowed through October, then increased again as the firearms deer season opened late in the ninth week of bear season.

Hunters took 353 bears (13%) during the 3 hunting days in August, but most of the 1988 harvest occurred during September, when 1,300 bears (49%) were registered. An additional 420 bears (16%) were tagged in October, and 578 bears (22%) were killed in November (Table FB2). The high harvest rate in August and September, when seasons on other game species were closed, suggested hunters expended considerable effort pursuing bears during those months.

Table FB2. 1988 Maine bear harvest by month and method of take.

Method of take	MONTH				
	Aug	Sept	Oct	Nov	Combined
Hunting with bait	321	958	104	4	1,388
Hunting with dogs	1	226	147	0	374
Trapping	1	51	20	3	75
Unknown	30	6	149	571	816
Total	353	1,301	420	578	2,652
Archery	29	84	20	0	133
Assisted by guide	222	837	170	19	1,248

Table FB3. 1988 Maine bear harvest by Wildlife Management Unit and method of take.

Method of take	WILDLIFE MANAGEMENT UNIT									
	1	2	3	4	5	6	7	8	Unk	State
Hunting with bait	261	544	197	104	176	94	—	0	12	1,388
Hunting with dogs	46	40	74	80	89	40	—	0	5	374
Trapping	4	13	28	9	7	14	—	0	0	75
Unknown	191	219	93	187	87	32	—	1	10	815
Total	502	816	392	380	359	180	—	1	22	2,652
Archery	21	31	22	34	13	11	—	0	1	133
Assisted by guide	202	475	192	120	183	67	—	1	9	1,248

The large November harvest reflected excellent hunting conditions in northern Maine during that month. Field personnel reported good hunting weather (light snow), substantial deer hunting pressure, and a scattered but locally abundant beechnut crop. Abundant fall foods allow bears to delay denning; radio-collared research bears in northern Maine delayed denning until late November. When fall foods are scarce, bears usually enter their dens during October. November harvests have fluctuated widely since the fall-only season was established in 1982, ranging from 174 to 612 bears.

Figure FB3. Percent of 1982 -1988 Maine bear harvests registered by resident hunters.

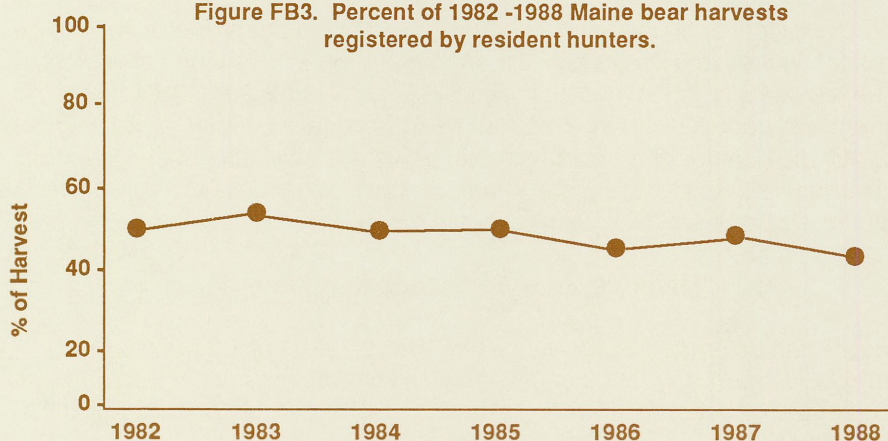
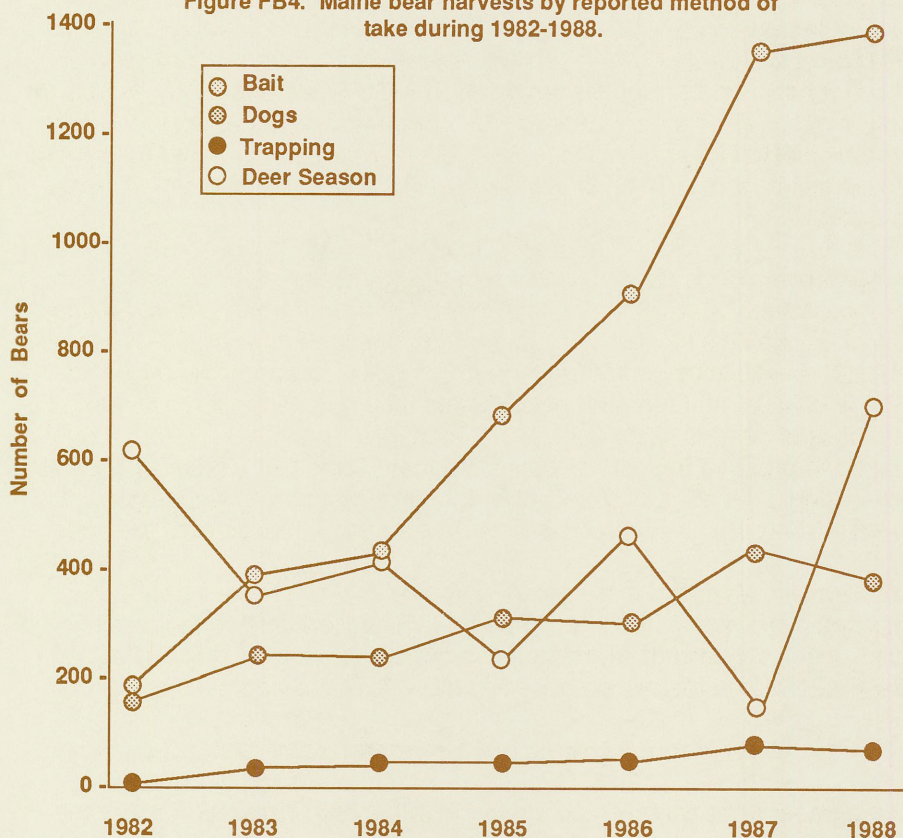


Figure FB4. Maine bear harvests by reported method of take during 1982-1988.



Residence of Successful Hunters

Maine residents harvested 968 bears, or 36% of the harvest. Despite large increases in harvest size since 1982, the proportion of bear harvests taken by Maine residents has declined only slightly (Figure FB3). Apparently both resident and nonresident sportsmen regard bears as trophies. No firm estimates of the number of hunters pursuing bears are available, but reports from field personnel, registered guides, hunters, and landowners indicate increasing numbers of sportsmen are pursuing bears each year.

Methods Used By Successful Hunters

Bears can be hunted over bait, hunted with dogs, trapped, hunted over natural food sources, or taken incidentally by hunters pursuing other species (usually deer or birds). Method of take was recorded for 1,836 bears, or 69% of the harvest (Tables FB2 and FB3, Figure FB4).

The number of bears harvested over bait in 1988 (1,388) was slightly greater than the high level experienced in 1987 (1,358 bears). Bait was used by successful hunters in WMU's 1-6 (Table FB3). Hunting over bait was the most popular method used by successful hunters in WMU 2, accounting for 544 bears, or 67% of the Unit's harvest. Most bears taken over bait (958 or 69%) were harvested in September, while 321 (23%) were taken in August, 104 more (8%) were taken with bait in October, and only 4 bears (<1%) were taken over bait in November (Table FB2). Nonresidents accounted for 73% of all successful baiters. Thirty-nine percent of successful residents (380 hunters) used bait.

Hunters using dogs harvested 374 bears (14% of the total harvest). Dogs were used to take bears in WMU's 1-6 (Table FB3) where they accounted for 5-25% of each Unit's harvest. Hunters using dogs took only 5% of the harvest in WMU 2. Maintaining contact with dogs in the remote, unsettled woods of WMU 2 is difficult, and probably discourages their use. Although over half of the successful hunters using dogs (60%) took their bears in September, they continued to produce bears throughout October (Table FB2). Most successful hunters using dogs (276, or 74%) were nonresidents; only 98 successful Mainers (10% of successful resident sportsmen) used dogs to take their bear.

Traditionally, a small but consistent percentage of the State's bear harvest is recorded by trappers. In 1988, 75 bears (3% of the total harvest) were trapped. Most of the trapping harvest (51 bears) occurred in September (Table FB2). Maine residents accounted for 97% of the trapped bears.

Bear Harvest During the Firearms Deer Season

The number of bears taken during the firearms deer season (October 29 - November 26) reached a record level in 1988. Although method of take was

unreported for 688 of the 701 bears taken after the deer season opened, most of these bears were probably taken incidentally by deer hunters. Fifty percent of the bears harvested during the firearms deer season were taken by resident sportsmen.

Archery Hunting

Bowhunters accounted for 133 bears, or 5% of the harvest (Table FB2). Archers took 34 bears in WMU 4, and 31 bears in WMU 2. Most bow-killed bruins (82) were taken in September (Table FB2). Nonresident archers took 83 bears, or 63% of the archery harvest.

Assistance By Registered Maine Guides

About 47% of successful hunters (1,248) employed Registered Maine Guides to assist them during their hunt. Guides aided successful hunters in WMU's 1-6, and helped take 58% of the bears harvested in WMU 2. Over half of the bears harvested in August and September, and 45% of the bears harvested in October, were taken with the assistance of guides. Only 2% of hunters taking bears in November used a guide (Table FB2). Most successful hunters using guides were nonresidents (1,117); only 131 successful residents (14%) employed a guide. Guides assisted 67% (925) of successful bait hunters, and 87% (324) of successful hunters using dogs.

Sex And Age Distribution Of The Harvest

The 1988 harvest included 1,456 males (56%), 1,163 females (44%), and 33 bears (1%) for which sex was not recorded (Table FB4). Although males dominated the harvest in August and September, the sex ratio was about equal in October, and more females than males were killed in November. A closer look at the take by hunting method reveals that hunters using bait and trappers took more males, hunters using dogs harvested roughly equal numbers of males and females, and the kill by unreported methods in November produced more females (Table FB4). Hunters using dogs harvested

Table FB4. Sex and age composition of the 1988 Maine bear harvest by month and method of take.

Method of take	MONTH											
	August			September			October			November		
	M	F	Unk	M	F	Unk	M	F	Unk	M	F	Unk
Hunting with bait	198	123	0	577	370	11	68	35	1	3	1	0
Hunting with dogs	1	0	0	119	106	1	66	79	2	0	0	0
Trapping	1	0	0	35	15	1	13	6	1	2	1	0
Unknown	20	10	0	19	46	1	64	83	2	270	288	13
Total	220	133	0	750	537	14	211	203	6	275	290	13
Archery	16	13	0	49	33	1	13	7	0	0	0	0
Assisted by guide	141	81	0	482	348	7	87	81	2	4	14	1
										714	524	10

more males in September, and more females in October. These differences may reflect behavior changes of males and females and consequently their vulnerability to various hunting techniques during the fall months, and/or different levels of selectivity for large bears by hunters using various techniques.

Statewide, hunters and trappers registered 2,235 adult bears (84%) and 385 cubs of the year; age was not reported for 32 bears (1%). Only 5% of the bears taken over dogs were reported to be cubs. About 10% of the bears harvested over bait or taken by trappers were cubs, and 20% of the kill by unreported methods was registered as cubs of the year. The low percentage of cubs in the harvest is consistent with percentages reported in recent years, and is considered an overestimate of the actual cub harvest. Aging studies conducted by the Department in the early 1980's indicated about half of the bears registered as cubs of the year were actually older. This disparity is a result of the slow growth of Maine bears and the difficulty of estimating bears' ages in the field.

Prospects for the 1989 Season

The 1989 bear season will open August 28 and close November 30. Bears may be hunted over bait from August 28 until November 10. Bear hunting with dogs will be permitted from August 28 until October 23. The bear trapping season will open September 1 and close October 31.

Maine's spring 1989 bear population is estimated at approximately 20,500 animals, slightly below the Department's objective level of 21,000 bears. Although another large harvest is expected in 1989, its size will depend on several factors, including the number and distribution of hunters and the availability and distribution of fall foods.

Future Management

Maine's black bear resource is being managed to maintain 1985 levels of distribution and abundance through 1990. The Department's bear management goal is based on Maine's capacity to produce bears, as well as input from several public interest groups concerned with bears.

Interest in bear hunting has been steadily increasing in the State; the Department's current harvest objective of 1,500-2,500 bears has been attained, and was exceeded in 1988. Future bear harvests must be closely monitored and controlled to maintain bear densities at desired levels. Knowledge of success rates of hunters employing various legal hunting methods throughout Maine's bear range is needed to reliably assess the impact of hunting on the bear population and control future bear harvests.

In 1990, a bear hunting permit will be required to hunt bear prior to the opening of the regular firearm season on deer. This permit will allow the

Department to monitor intentional bear hunting effort and success, and more accurately track the status of the species. Permits will be available through Department license agents.

The Commissioner currently lacks authority to effectively regulate bear hunting if the harvest continues to increase above objective levels. Without additional legislation, a restriction in season length is the only tool available to limit excessive harvest of bears.

FURBEARERS

Maine's upland furbearers include coyote, fox (both red and gray), bobcat, Canada lynx, fisher, marten, raccoon, skunk, and weasels (short-and long-tailed). Canada lynx are protected and cannot be taken by hunting or trapping. Aquatic furbearers in Maine include beaver, otter, mink, and muskrat. All furbearers may be taken by trapping and fox, coyote, bobcat, raccoon and skunk may be taken by hunting.

1988-89 Fur Harvest

The general trapping season for all furbearers (except beaver) ran from October 30 to December 4. Beaver season ran from December 1 to March 30 in Wildlife Management Units (WMU) 1 and 2, and from January 1 to February 28 in all other WMU's. Hunting for raccoon and skunk was allowed from October 31 to December 15. Fox hunting season ran from October 31 to February 15, and bobcat hunting was allowed from December 1 to January 31. There was no closed season on coyote hunting.

Harvest of most furbearers dropped significantly in 1988-89 (Table FB5). Predictions of (and realized) very low pelt prices for most species caused a drop in effort by most trappers and a shift to more profitable species by others. In addition, 3 weeks of wet weather affected trapping success, and a good crop of fall beechnuts influenced habitat use and reduced response to bait by marten. Access by beaver trappers during the winter was enhanced by low snowfalls over much of the southern and coastal sections of the state.

In general, average prices paid for pelts of most furbearers dropped considerably from 1987-88, with marten and mink being notable exceptions (Table FB6).

Future Management

Maine's furbearer programs are centered around three major activities: 1) development of management operational plans or "systems", 2) collection of harvest, trapper, and furbearer population data, and 3) research.

Table FB 5. Furbearer harvests in Maine, 1984-1989.

	1984-85	1985-86	1986-87	1987-88	1988-89
Raccoon	22,089	19,328	17,848	22,025	6,439
Mink	2,027	2,094	2,072	3,466	2,550
Otter	839	802	1,037	1,035	676
Beaver	12,785	11,211	12,152	12,611	10,311
Marten	4,575	8,745	3,951	6,424	2,698
Fisher	1,666	2,229	1,851	2,090	1,211
Fox (R & G)	4,449	4,798	4,215	4,540	2,454
Coyote	1,358	1,393	1,151	1,631	1,251
Bobcat	270	277	179	91	89

Table FB 6. Total estimated value of furbearers taken in Maine in 1988-89.

Raccoon	\$38,312
Mink	\$6,500
Otter	\$15,514
Beaver	\$195,909
Marten	\$110,618
Fisher	94,458
Fox (R & G)	\$40,491
Coyote	\$10,946
Bobcat	\$2,250
Muskrat	125,000
Total	\$709,998

Management systems are documentation of management activities for each furbearer species, including goals to be managed for, data collected, method of analysis and interpretation, and specific management actions to be recommended in different situations. Systems are reviewed and critiqued heavily within the Wildlife Division to ensure the best management techniques are being applied to each species within the time and money constraints of the Department, and to enable the Wildlife Division to manage furbearers in a proactive instead of reactive manner.

Data collected through pelt tagging, surveys, etc. are only those essential to management of each species. Research programs, both through the Wildlife Division and in cooperation with the University of Maine/Cooperative Wildlife Research Unit, are designed to answer specific management related problems and to further our knowledge of the biology and behavior of some of the highly secretive furbearers.

Furbearer management is still hampered by inadequate information on reproductive and population biology of some furbearers, and the amount of effort expended by trappers towards capture of each species. Programs outlined below are designed to address these needs.

Research and Special Projects

Effects of harvests on bobcat, marten and fisher continue to be special concerns of the Wildlife Division. Currently, indices used to assess changes in population levels are hampered by lack of specific reproductive information and lack of information concerning the effort expended to capture each furbearer. Currently, we are evaluating snow-tracking as an index of marten, fisher, and bobcat populations, so we can compare population trends against harvest trends.

Information on the amount of effort it takes to capture an animal is essential, because it provides insight into harvest trends. For example, if the harvest of marten decreased during a particular year, or over several years, we would need to know whether the decrease was due to a drop in the marten population or if there was a reduction in trapping effort. This kind of information is not available to us at this time. However, a daily record diary/log is being developed to distribute to trappers. Each log will have a confidential (no name) summary page of the number of traps set for each animal. Only this summary page will be mailed back to the Department. The log book will provide the trapper with a complete record of trapping activities for a season, and the summary page will enable the Wildlife Division to estimate the amount of effort invested in catching each furbearer.

The Wildlife Division is also supporting and/or cooperating with 3 different furbearer projects through the University of Maine/Cooperative Wildlife Research Unit. A study of fisher reproduction in the Waldo County is almost completed. It is providing data on the percentage of females breeding each year, and how many young they produce. This information will help us understand how much trapping pressure a fisher population can withstand.

A second project, started in May 1989, is studying effects of heavy timber cutting and trapping on marten productivity. As marten habitat is modified by timber harvesting, and more roads and high pelt prices keep trapping pressure high, there are fewer places where marten are not trapped. We need to know if marten can produce young and sustain themselves in less-than-ideal habitat, if we are to set reasonable harvest goals that will not reduce the base population of marten in Maine.

The third project is designed to help balance beaver populations with the need to create and maintain productive wetland habitat for waterfowl. Wetlands created by beaver typically remain productive for waterfowl for a few years and then begin to fall off. To maintain productivity, these wetlands need

to drain periodically and recycle. Recycling occurs naturally as old beaver dams wash out, new vegetation grows in the drained pond site, and eventually beaver rebuild old dams to reflood the pond site. Therefore, in order to maintain the best wetlands for waterfowl, it may not be desirable to have maximum beaver numbers. Too many beaver mean that all available habitat will be filled and ponds not allowed to periodically recycle. This project will help us understand the relationship between beaver densities and wetland productivity.





CERVIDS

CARIBOU REINTRODUCTION

In 1986, the Maine Caribou Transplant Corporation (MCTC) was formed to privately finance an experimental reintroduction of caribou from Newfoundland to Maine. Since then, MDIFW has been indirectly involved, because its responsibilities include approving such reintroductions. Once the caribou are released, they come under the jurisdiction and protection of MDIFW (\$10,000 fine for killing a caribou). MCTC is responsible for the caribou reintroduction experiment, including post-release monitoring. In 1993, MDIFW will assume total responsibility for all released caribou.

MDIFW biologists have closely followed the experiment since 1986. Concerns about bringing a new parasite (*Elaphostrongylus cervi*) from Newfoundland into Maine have been addressed through intensive treatment and testing of each caribou before it may be released. In addition, our biologists provided technical advice for radio-collaring caribou and development of the monitoring program. The primary goal is to determine the fate of each caribou released into the wild. Caribou that die will be recovered and examined to determine cause of death. In addition, movements of caribou will be closely monitored to determine how far they move and what habitats they prefer.

In April 1989, 12 caribou were released into Baxter State Park. Plans call for additional release of 50-100 animals by summer 1992.

Those interested in contributing to this effort can write to the Maine Caribou Transplant Corp., 240 Nutting Hall, University of Maine, Orono, ME 04469.

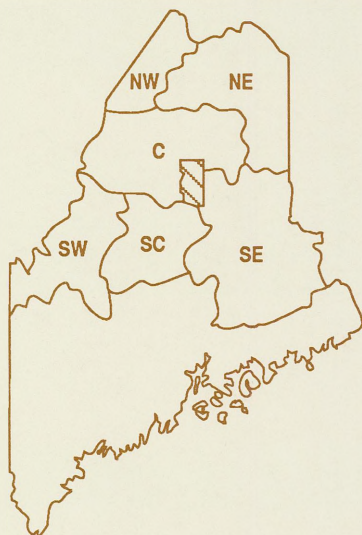
MOOSE

1988 Moose Season

In 1988, 932 moose hunting permit holders, or their subpermittees, harvested a moose in Maine. This success rate (93%) was the highest of any modern day moose season. Record success rates were set for the Northwest, Northeast and Southwest zones (Figure C1). Central and Southcentral zones have had above 90% success for the last 3 seasons. The Southeast zone had the highest success since the zone was expanded to include an area south of the Canadian Pacific tracks (Table C1, Figure C1).

Composition of the kill (Table C2) is similar to past years, but it does not represent the structure of the herd. Smaller numbers of calves, and the

Figure C1. Maine moose hunting zones, 1989.



NW	Northwestern Zone	100 permits
SW	Southwestern Zone	120 permits
NE	Northeastern Zone	220 permits
SC	Southcentral Zone	120 permits
C	Central Zone	290 permits
SE	Southeastern Zone	150 permits

1989 MOOSE HUNTING ZONES

Table C1. Percent of permittees who registered a moose by zone and season.¹

Moose		Season						
Hunt	9/22-27	9/20-25	9/19-24	10/8-13	10/21-26	10/20-25	10/18-23	10/17-22
Zone	1980	1982	1983	1984	1985	1986 ²	1987	1988
NW			57	67	73	65	64	84
NE			66	78	86	85	90	93
CE	No zones	Not registered by zones	78	82	89	90	96	92
SE			65	83	86	72	78	82
SC			95	94	98	100	98	98
SW			92	91	98	91	98	100
ALL	91	88	74	82	88	86	89	93

¹Boldface numbers indicate seasons in which hunting regulations and conditions were comparable within each zone.

²Area open to hunting expanded in three southern zones.

Table C2. 1988 Moose harvest by zone (1000 permits).

Sex/Age	NW	NE	CE	SE	SC	SW	ALL
Male calf	6	7	3	6	1	2	25
Female calf	0	3	5	3	4	3	18
Male y'ling	18	26	51	17	11	4	127
Female y'ling	5	12	10	4	3	3	37
Male adult	30	109	148	63	68	80	498
Female adult	24	48	64	31	31	28	226
Unknown	1	0	0	0	0	0	1
Total	84	205	281	124	118	120	932

preponderance of males among yearlings and adults, are due to hunters choosing to shoot specific types of moose.

Hunters who receive a moose permit are required to fill out a questionnaire. Analysis of these questionnaires provide insight into the behavior of hunters, and it helps us to interpret harvest data.

For instance, hunters do not always kill the first moose they see, and they appear to be becoming more selective. In 1988, hunters passed up 68% of the moose they could have killed, as compared to 57% in 1983. Surprisingly, they have been passing up more bulls. In 1983, hunters did not shoot 27% of the bulls they could have shot. By 1988, that percentage had increased to 46%.

Reasons for not shooting a bull also appear to be changing. Since 1983, fewer hunters have indicated bulls were passed up because they would have been too hard to get out of the woods or because there was too great a risk of only wounding the animal. In 1988, hunters were more likely to pass up a bull because they preferred to shoot a cow or calf in the late October season as compared to seasons in September or early October. Bulls passed up because they were "too small" or "not a trophy" has not shown a definite trend. Bulls passed up for other reasons, including meat quality, more than doubled from 1983 to 1988. In early seasons "poor meat quality" was rarely mentioned as a reason for rejecting moose. Recently it has been listed more frequently. In summary, increased selection against bulls appears to be primarily a change in hunter behavior related to perceived poorer meat quality (leanness) of bulls in late October, rather than the reduced availability of bulls.

Prospects for the 1989 Season

In 1989, season length, timing, permit allocation, and zone lines will be the same as the past 3 moose seasons. With the moose population apparently increasing in most zones, hunter success is expected to be similar to the last 3 seasons.

Future Management

While the current moose hunting season is the most liberal permitted by law, it is rather conservative by biological standards. Bills to increase the maximum number of permits to 1,500 failed to pass in the legislature in 1989, so we can expect the number of permits to remain at 1,000 in the near future.

In addition to comments and questions about the number of permits, recently questions have also been raised about the effect of season timing on the quality (weight) of harvested moose and on the percentage of bulls harvested (Table C3). During September seasons, bull moose over 1000 pounds were fairly common, but in late October seasons bulls of this size were

rare. Average weight of full grown (5 years and older) bull moose was less in late October seasons, and the animals were noticeably thinner. This difference is the result of moose rutting (breeding) behavior; it is not an indicator of low food availability. During the rut (late September-early October), bulls become more active, eat very little, and therefore lose weight. Cows, which do not exhibit as great a behavioral change, weigh approximately the same in September and October seasons.

Numbers of older bulls harvested have decreased with the change in the moose season from late September to late October. Bulls in the harvest over 5 years of age and the ratio of adult bulls to adult cows both declined. Changes in hunter selectivity account for some changes, but it is likely that moose behavior is a more important factor. During the rut, bulls are more active and less wary, and therefore more likely to be shot. Older bulls enter the rut earlier than yearlings and young adults, therefore they are more vulnerable in September. Younger bulls are more vulnerable later in October than are older bulls.

Table C3. Mean dressed weights (to nearest 5 lbs.) of moose older than five years and kill composition by season.

	Season							
	9/22-27 1980	9/20-25 1982	9/19-24 1983	10/8-13 1984	10/21-26 1985	10/20-25 1986 ¹	10/18-23 1987	10/17-22 1988
Cow weight	590	540	570	590	NA	580	590	605
Bull weight	875	845	825	785	NA	765	760	760
% Bulls 5 years and older	41	48	44	32	NA	23	23	26
Adult Bulls/100 Adult Cows ²	273	282	248	243	169	170	176	220

¹Area open to hunting expanded in three southern zones.

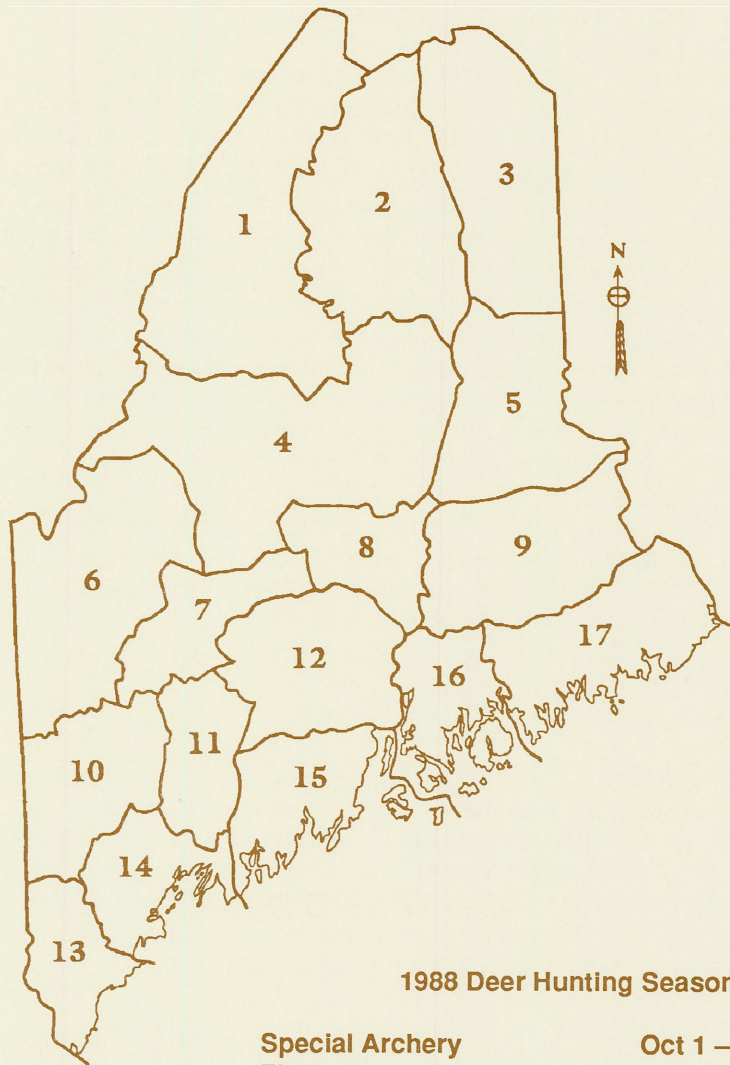
²Adults = animals two years old and older.

WHITE-TAILED DEER

1988 Deer Season

Hunters in Maine could pursue deer a total of 55 hunting days during 1988. During the special archery season (24 days, October 1-28), archers could hunt deer of either sex. The regular firearm season, which began for residents on October 29 and for all hunters the following Monday (October 31), ended for all hunters on November 26 (25 hunting days). Black powder enthusiasts had 6 more days to pursue white-tails during the special muzzleloader season (November 28 to December 6). Deer could not be hunted on Sunday, and the limit on deer remained the same, 1 deer per hunter per year.

During the regular firearm and special muzzleloader seasons, hunters could harvest a buck (a deer with antlers at least 3 inches in length) anywhere in Maine. Those who possessed an Any-Deer permit could choose to harvest a doe or fawn instead, but only within a specific Deer Management District (DMD; Figure C2).



1988 Deer Hunting Seasons

Special Archery	Oct 1 — Oct. 28
Firearms	
Maine Residents Only	Oct. 29
All Hunters	Oct. 31 — Nov. 26
Special Muzzleloader	Nov. 28 — Dec. 3

Figure C2. Location of Maine Deer Management Districts.

The Any-Deer permit system is designed to regulate the harvest of does within each DMD in order to achieve and maintain optimum deer population levels. During 1988, 44,977 Any-Deer permits were allocated among 16 DMDs. No Any-Deer permits were issued for DMD 17 (Figure C2). Desired harvest levels of adult does (fawns excluded) ranged from 0 in DMD 17 to 1,560 in DMD 12 and totaled approximately 7,000 statewide.

1988 Deer Harvest

Statewide

During 1988, 28,056 deer were registered, of which 302 were taken during special archery, 27,692 during the regular firearm, and 62 during the special muzzleloader seasons. The 1988 deer harvest was 18% higher than the 1987 harvest (23, 729). Increases were noted for antlered bucks, as well as does and fawns. Although the increase in the doe and fawn harvest may be attributable to a higher allocation of Any-Deer permits in 1988 (10,000 more were issued than during 1987), the 13% increase in the antlered buck harvest reflects an increasing deer herd. Relative to 1987, the archery kill remained stable (294 were killed in 1987), but the 1988 muzzleloader take nearly doubled (33 were registered last year).

Total harvest during 1988 was similar to those registered during the early 1980's (for example 28,834 in 1982), when all 200,000 hunters could pursue does and fawns as well as bucks. This was important, considering less than 25% of the hunting force was allowed to hunt antlerless deer during the 1988 season.

Buck Harvest

The antlered buck harvest (buck fawns excluded) totaled 17,139 and was the 5th highest buck kill recorded for Maine since record keeping began in 1919. This represents a 30-year high for buck harvests in Maine (the 1959 buck kill was 17,154)! Since the deer herd began increasing in response to antlerless deer harvest restrictions in 1983, the buck kill has gradually increased by 34% over 6 years. During the five final years of either-sex hunting in Maine (1978-82), the buck harvest averaged 12,813.

Some hunters believe the increased buck harvest is the result of heavier exploitation of bucks. While it is possible bucks-only and Any-Deer permit hunting could focus extra hunting pressure on bucks, available data do not support this theory.

If the buck population was being hunted harder than previously, fewer and fewer individual bucks would survive to achieve trophy size and age. In addition, an increasing proportion of the buck population would be in younger age classes. Although yearling bucks have become more abundant in the

harvest, so too have trophy bucks. In fact, the ratio of yearling to trophy age bucks has remained remarkably stable throughout the 1970's and 1980's. In 1988, yearling bucks comprised slightly less than 40% of the antlered buck harvest. Roughly 25% of the harvest were really big bucks, 4 1/2 years old to the rare old timers (Figure C3).



Figure C3. Distribution of the 1988 harvest of antlered bucks by age class and dressed weight.

Antlerless Harvest

Any-Deer permits (44,977) issued during 1988 were very close to ideal, since the adult doe harvest (6,797 statewide) came within 4% of the desired quota of 7,000 does. Doe harvests varied by less than 4% of the desired quota in half of the 16 DMDs which had a quota. Elsewhere, doe harvests missed desired quotas by 5 to 20%, most were below the quota.

Hunting pressure on does and fawns has been reduced to allow the herd to expand within **all** DMDs. However, the degree to which does are protected may vary from one DMD to another because of differences in the capability of the habitat to support deer and the rate at which population goals are to be achieved.

Statewide, 4,120 fawns of both sexes were registered by holders of Any-Deer permits during 1988. Interestingly, hunters seemed to be selecting against harvesting fawns. Under either-sex hunts, the fawn harvest nearly equalled (and sometimes exceeded) the adult doe kill. However, since 1986, the fawn harvest has dropped to 55-60% of the doe harvest. Similar declines in the relative harvest of fawns has been noted in several other states that utilize "doe permits". Declines in the harvest rate of fawns is related to hunter behavior and does not reflect real declines in actual fawn abundance. Actually, reducing the harvest rate of fawns benefits all hunters by allowing a higher number of males to become available in subsequent years as antlered

bucks. In addition, more females are also recruited into the adult doe population, potentially boosting future fawn production.

Harvest by Week

A four-week regular firearm season with unified opening and closing season dates statewide was implemented in 1984. This season structure, combined with the Any-Deer permit system for doe harvest (first implemented in 1986) was designed to reduce unnecessary hunter movement between DMDs. It also reduced the intense hunting pressure experienced during past hunts, including either-sex and bucks-only hunts. Hunter shifts and unregulated hunting pressure are undesirable, because they result in unpredictable doe harvests which may contribute to herd declines.

The current season structure has also been successful in distributing hunting effort more evenly throughout the season (Table C4). Buck and antlerless deer harvests were similar during all but the final week of gun season. Opening Saturday (for residents) accounted for 10% of the total harvest. The buck harvest was remarkably similar between weeks. Doe and fawn harvests declined slightly during each succeeding week until the final 6 days, when Any-Deer permit holders “cashed in” during the Thanksgiving holiday week.

This weekly kill pattern stands in sharp contrast to past either-sex hunts. During the early 1980's, the 3-week either-sex hunts in the southern half of the state encouraged intense hunting pressure early in the season. Opening Saturday typically accounted for 15% of the harvest, and 35 to 40% of the kill occurred during opening week. At least half of the harvest occurred during the

Table C4. Sex and age composition of the 1988 deer harvest by season type and week of the regular firearm season, statewide.¹

Period	Sex/Age Class				Total Deer	Total Antlerless Deer	Percent by Week		
	Adult		Fawn				Adult		
	Buck	Doe	Buck	Doe			Total	Buck	Antlerless
Special Archery	108	113	35	46	302	194	1	1	2
Regular Firearm									
Opening Sat.	1,656	732	239	216	2,843	1,187	10	10	11
10/31-11/5	3,534	1,550	532	447	6,063	2,529	22	21	23
11/7-11/12	4,018	1,337	415	367	6,137	2,119	22	23	19
11/14-11/19	3,627	953	319	266	5,165	1,538	18	21	14
11/21-11/26	4,165	2,092	643	584	7,484	3,319	27	24	30
Special Muzzleloader	31	20	8	3	62	31	<1	<1	<1
Total	17,139	6,797	2,191	1,929	28,056	10,917	100	100	100

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

opening 7 days of those 19-day hunts. Does and fawns comprised a large portion of the harvest during the early part of the season. Bucks made up a higher proportion of the kill during subsequent weeks, unless there was a good tracking snow. When snow fell, usually late in the season, the antlerless deer kill would substantially increase, often to the detriment of the herd. As noted in the previous section, the Any-Deer permit system has markedly reduced such extreme fluctuations in the doe harvest and has provided a great deal of predictability in achieving harvest levels necessary to manage the herd.

Harvest by DMD

Differences in doe and fawn harvests among DMDs largely stemmed from differences in Any-Deer permit allocations (Table C5). Although antlered buck harvests may be influenced by regional differences in hunting pressure, the size of the buck kill per sq. mi. reflected the relative abundance of deer in the DMDs.

Table C5. Sex and age composition of the 1988 deer harvest by Deer Management District.¹

Deer Mngmnt District	Sex/Age Class				Total Deer	Total Antlerless Deer	AdultDoes Per 100 Adult Buck	Buck Kill Per Mi² Habitat	Deer Kill Per Mi² Habitat
	Adult		Fawn						
	Buck	Doe	Buck	Doe					
1	878	152	51	43	1,124	246	17	0.24	0.31
2	808	167	52	46	1,073	265	21	0.30	0.40
3	375	86	25	20	506	131	23	0.16	0.22
4	1,268	361	110	108	1,847	579	28	0.36	0.53
5	1,177	494	147	143	1,961	784	42	0.66	1.10
6	814	169	74	39	1,096	282	21	0.32	0.43
7	922	396	120	110	1,548	626	42	1.10	1.85
8	1,346	687	215	195	2,443	1,097	51	1.36	2.47
9	727	226	72	58	1,083	356	31	0.40	0.60
10	1,052	349	118	86	1,605	553	33	0.67	1.02
11	712	357	101	105	1,275	563	50	0.92	1.65
12	2,827	1,597	529	474	5,427	2,600	56	1.51	2.90
13	1,110	550	166	154	1,980	870	50	1.12	1.99
14	968	403	169	136	1,676	708	42	1.43	2.47
15	1,136	628	191	169	2,124	988	55	1.06	1.98
16	584	173	51	42	850	266	30	0.70	1.08
17	435	2	0	1	438	3	<1	0.25	0.25
State- wide	17,139	6,797	2,191	1,929	28,056	10,917	40	0.58	0.95
Percent	61	24	8	7	100	39			

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

Highest buck kills occurred in central and south-coastal DMDs (Figure C2; Table C5). Northern and east-coastal DMDs had considerably lower buck kills and deer numbers.

Table C6. Deer registrations by Deer Management District and hunter residence, 1988.

Deer Mngmnt District	Deer Registered by:				Total 1988	Total 1987	Percent Change
	Residents		Nonresidents				
	No.	%	No.	%			
1	414	58	710	42	1,124	757	48
2	606	56	467	44	1,073	710	51
3	427	84	79	16	506	384	32
4	1,107	60	740	40	1,847	1,313	41
5	1,405	72	556	28	1,961	1,583	24
6	730	67	366	33	1,096	726	51
7	1,168	75	380	25	1,548	1,169	32
8	1,934	79	509	21	2,443	1,950	25
9	824	76	259	24	1,083	1,079	<1
10	1,425	89	180	11	1,605	1,427	12
11	1,189	93	86	7	1,275	1,199	6
12	4,693	86	734	14	5,427	4,609	18
13	1,778	90	202	10	1,980	1,794	10
14	1,634	97	42	3	1,676	1,589	5
15	1,939	91	185	9	2,124	2,164	-2
16	768	90	82	10	850	746	14
17	382	87	56	13	438	530	-17
Statewide	22,423	80	5,633	20	28,056	23,729	18

Harvest by Hunter Residency

Maine residents claimed the lion's share (80%) of the 1988 deer harvest (Table C6). As has occurred during the past several decades, nonresidents registered about one fifth of the total kill and accounted for roughly 15% of the deer license sales.

Regional differences occurred in the distribution of the harvest by residents and visitors to Maine (Table C6). Most of the successful deer hunters in the more populous central and southern DMDs were residents, but nonresidents accounted for a much higher share of the harvest in northern and western DMDs (Figure C2, Table C6).

A substantial number of Maine residents travelled to hunting areas outside of their home DMD. Many hunters pursued deer in two or more DMDs, including their home district. Overall, 24% of the statewide deer harvest was registered by residents who travelled to another DMD. As little as 10% (DMD 14) to as much as 70% (DMD 2) of the harvest was taken by Maine residents who hunted away from their home DMD.

Hunter Participation and Success Rate

During 1988, nearly 225,000 licenses which permit deer hunting were sold in Maine, 82% bought by residents. License sales increased by nearly 10% compared to 1987, but remained well within the range of sales fluctuations experienced since 1975 (200,000 to 240,000 licenses).

Not all hunters who purchase big game (non-residents) or general (residents) hunting licenses actually pursue deer. According to past surveys (1970-84), approximately 15% of these license buyers choose not to deer hunt. When these hunters are subtracted from total hunting license sales, the estimated number of hunters who actually hunted deer in 1988 was approximately 191,000. Of this total, 156,000 likely were residents and 35,000 were nonresidents.

Among archers, 9,296 residents and 991 nonresidents bought licenses which allowed them to hunt during the special archery season. The 10,287 archery licenses sold represent a 20% increase over 1987. This increase reflects a strong trend toward bowhunting participation since 1983, when harvest restrictions were implemented for gun hunters. During the past 6 seasons, archery license sales have nearly doubled. However, the impact of bowhunting on deer populations remains negligible.

Sales of muzzleloading hunting permits was nearly 1,800 during 1988, 96% of which were purchased by residents. Participation in Maine's black powder hunts has doubled since the first hunt in 1981. As with archery hunting, the impact of this season on the deer herd has been negligible. Muzzleloader hunters must also comply with Any-Deer permit regulations.

Hunter success averaged 14.5% among regular firearm hunters during 1988. Success rate for nonresidents (16.2%) was slightly higher than for residents (14.3%) during the regular firearm season. Success rate for holders of Any-Deer permits was considerably higher (32%), since permittees could have harvest either a doe, fawn, or buck. Only 2.9% of total archery hunters and 3.4% of the muzzleloader hunters, were successful.

Current Deer Population Status

Since 1983, herds in most DMDs have increased in response to doe harvest restrictions and some rather mild winters. The estimated post-hunt herd has increased from 160,000 deer prior to 1983 to 250,000 deer during 1988. Currently, the herd remains in balance with available food supply. Although within a few DMDs deer populations are approaching desired levels, habitat in all DMDs is sufficient to support more deer. These increases may be accomplished while maintaining quality deer, if winters remain mild to moderate in severity.

Recent estimates suggest a population of 300,000 deer can be maintained in good condition in Maine. To achieve this level, population objectives have been set for individual DMDs. These objectives will continue to guide decisions concerning allocation of Any-Deer permits during 1989 and subsequent years.

Prospects For The 1989 Season

Season structure will remain similar to 1988. Continued growth in Maine's deer population, combined with the generally mild winter of 1988-89, resulted in an increase in the doe quota in 14 DMDs, and a corresponding increase in Any-Deer permits. Doe quotas in DMDs 11 and 15 were reduced slightly in response to a slight decline in the buck kill in 1988. The doe harvest reduction is intended to increase deer population growth rate in these DMDs. No does will be harvested in DMD 17 for the 7th straight year in an attempt to encourage a herd increase.

The 1989 adult doe quota totals 8,400. To achieve that harvest, 56,219 Any-Deer permits will be issued. This will represent an increase of 10,000+ permits over 1988. If that harvest is achieved, an additional 5,000 fawns are likely to be harvested. We are optimistic about the possibility of a near-record antlered buck harvest during 1989. The projected buck kill for 1989 may reach 18,000+. The total harvest during 1989 should be in the vicinity of 31,000 deer, given reasonable hunting conditions.



COASTAL WILDLIFE HABITAT PROTECTION

With approximately 2500 miles of coastline and more than 3500 islands and ledges, the coast of Maine supports an extraordinary diversity and abundance of marine wildlife habitats. More than 150 species of birds and mammals depend on the biological productivity and physical characteristics of Maine's salt marshes, mud flats, sand beaches, estuaries, islands, and adjacent coastal waters for food and shelter during some period of their life cycle. Nearly one third of these animals are currently listed by MDIFW as some of the rarest or most endangered species in Maine.

Maine's coastal habitats, and the wildlife they support, represent significant ecological, aesthetic, cultural, and economic values to our state and, in some cases, are unique to North America. Increased development and recreational use of Maine's coastal areas has become a major concern of coastal residents, conservation organizations, local governments, and state natural resource agencies, including MDIFW. This concern has led to implementation of habitat protection initiatives.

Beginning in 1986, with a pilot project in Penobscot Bay and support from federal Coastal Zone Management funds, the Department undertook an effort to identify, rate, map, and develop land use guidelines for important fish and wildlife habitats in Maine's coastal tier towns. This work targeted all wildlife, not just rare or endangered species. Locations of bald eagle nest sites, seabird islands, shorebird roosts, wetlands, deer yards, fisheries, wading bird rookeries, seal haul-outs, and other areas of special concern have been identified via aerial and ground surveys of 84 towns in the coastal tier.¹ When surveys currently underway are completed, significant fish and wildlife habitat information will be available for all coastal towns from the New Hampshire border to the town of Addison in Washington County.

Coastal wildlife concentration areas are also identified in these surveys. These areas represent habitats of state, regional, or local significance. Their relative value is determined by the abundance and/or diversity of coastal wildlife they support, or their value to rare species. Class A areas are especially important habitats with exceptionally high numbers of one or many species, or are known to be used by endangered or threatened species.

¹Significant fish and wildlife habitat information and resource maps for coastal towns are available for review in MDIFW regional offices or the headquarters in Augusta.

These areas represent only a very small proportion of the available coastal habitat, yet they support a large percentage of the wildlife resource along the coast. Therefore, these sites are of tremendous importance to natural resource planning and conservation along the coast.

Information gathered in MDIFW's coastal inventories, and conservation guidelines being developed to maintain existing habitat quality, are being provided to coastal towns to support municipal land use planning initiatives. MDIFW is also working with conservation organizations, and other state agencies, in order to encourage conservation of these sensitive habitats.



ENDANGERED AND NONGAME WILDLIFE

In 1984, the Endangered and Nongame Wildlife Project was established by the Department to coordinate the development of rare, endangered, and other nongame wildlife conservation programs. Since its establishment, the project has focused on four primary issues: natural history surveys; species recovery; habitat protection; and public service and education.

Natural History Surveys

There are about 450 species of nongame vertebrates in Maine, including some very rare and endangered species (Table NG1). An understanding of the status and management needs of these little understood species is being pieced together through a wide range of surveys, inventories, and research projects. Results include rediscovery of the threatened northern bog lemming in Maine after 80 years; finding several ponds containing the threatened Blanding's turtle; and discovery of nesting golden eagles in Maine. More than 25 grants and contracts have been awarded for natural history survey work, benefiting dozens of species.

Species Recovery Projects

Some of Maine's rare and endangered species need intensive management to prevent their loss from Maine or to increase populations to secure levels. Recovery programs are now operational for the bald eagle, peregrine falcon, piping plover, and least tern, and are being developed for other species. Management actions can begin for them as funds become available.

Habitat Protection

About 90 of the 450 nongame species in Maine require special attention by MDIFW if they are to be maintained as part of our wildlife heritage. The greatest and most common problem facing these 90 species is loss of habitat. A considerable effort is being made by MDIFW to identify essential and significant habitat for these species and to protect these sites using a wide array of land protection tools. In 1988, more than 80 sites important to rare or endangered wildlife received protective action from MDIFW. Among the most notable were negotiations for the purchase of the Kennebunk Plains for the grasshopper sparrow, black racer, and upland sandpiper; the agreement with a major power company to reroute a proposed transmission line away from a

Table NG1. Maine Rare and Endangered Species

I. Maine Endangered Species: Species in immediate danger of extirpation (extermination).

- | | | |
|----------------------|------------------------|-----------------------------|
| 1. Bald Eagle* | 7. Sedge Wren | 12. Sperm Whale* |
| 2. Peregrine Falcon* | 8. Grasshopper Sparrow | 13. Sei Whale* |
| 3. Golden Eagle | 9. Right Whale* | 14. Leatherback Turtle* |
| 4. Piping Plover** | 10. Humpback Whale* | 15. Atlantic Ridley Turtle* |
| 5. Least Tern | 11. Finback Whale* | 16. Box Turtle |
| 6. Roseate Tern* | | 17. Black Racer |

*Federally listed Endangered Species

**Federally listed Threatened Species

II. Maine Threatened Species: Species that will become endangered if current populations experience further decline.

- | | |
|-----------------------------|----------------------|
| 1. Tundra Peregrine Falcon* | 4. Blanding's Turtle |
| 2. Northern Bog Lemming | 5. Spotted Turtle |
| 3. Loggerhead Turtle* | |

*Federally listed Threatened Species

III. Maine Special Concern Species: Species particularly vulnerable to population decline due to restricted distribution and/or habitat loss.

- | | |
|----------------------------|---------------------------|
| 1. Harlequin Duck | 4. Water Pipit |
| 2. Common Tern | 5. New England Cottontail |
| 3. Arctic Tern | 6. Ribbon Snake |
| 7. Landlocked Arctic Charr | |

IV. Maine Species of Indeterminate Status: Indigenous wildlife believed to be of endangered, threatened, or special concern status, but about which insufficient data are available.

- | | | | |
|------------------------------|-----------------------------|---------------------------|-----------------------|
| 1. Least Bittern | 6. Southern Flying Squirrel | 12. Little Brown Myotis | 17. Wood Turtle |
| 2. Upland Sandpiper | 7. Yellow-nosed Vole | 13. Keen's Myotis | 18. Brown Snake |
| 3. Black-crowned Night Heron | 8. Red Bat | 14. Small-footed Myotis | 19. Swamp Darter |
| 4. Horned Lark | 9. Hoary Bat | 15. Eastern Pipistrelle | 20. Brook Stickleback |
| 5. Orchard Oriole | 10. Silver-haired Bat | 16. Tremblay's Salamander | 21. Grass Pickerel |
| | 11. Big Brown Bat | | 22. Lynx |

V. Maine Watch List: Species that do not meet the rigorous requirements of inclusion in Categories I through IV, but do warrant special attention.

- | | | | |
|-------------------------|--------------------------|----------------------------|--------------------------|
| 1. Leach's Storm-Petrel | 9. Cooper's Hawk | 17. White-rumped Sandpiper | 25. Black Tern |
| 2. Snowy Egret | 10. Red-shouldered Hawk | 18. Least Sandpiper | 26. Razorbill |
| 3. Little Blue Heron | 11. Semipalmated Plover | 19. Dunlin | 27. Atlantic Puffin |
| 4. Tricolored Heron | 12. Black-bellied Plover | 20. Short-billed Dowitcher | 28. Eastern Bluebird |
| 5. Cattle Egret | 13. Ruddy Turnstone | 21. Semipalmated Sandpiper | 29. Vesper Sparrow |
| 6. Glossy Ibis | 14. Whimbrel | 22. Sanderling | 30. Sharp-tailed Sparrow |
| 7. American Black Duck | 15. Greater Yellowlegs | 23. Red-necked Phalarope | 31. Southern Bog Lemming |
| 8. Barrow's Goldeneye | 16. Lesser Yellowlegs | 24. Bonaparte's Gull | 32. Long-tailed Shrew |

VI. Maine Extirpated Species: Species of wildlife that were once indigenous to Maine but have not been documented as indigenous for the past 50 years.

- | | | |
|-----------------------------|-------------------------------|------------------------|
| 1. Labrador Duck (extinct) | 5. Passenger Pigeon (extinct) | 8. Gray Wolf |
| 2. Eastern Anatom Peregrine | 6. Loggerhead Shrike | 9. Woodland Caribou |
| 3. Eskimo Curlew | 7. Sea Mink (extinct) | 10. Eastern Cougar |
| 4. Great Auk (extinct) | | 11. Timber Rattlesnake |

golden eagle nest site; the cooperative development of an endangered species management plan for Brunswick Naval Air Station, one of just four grasshopper sparrow nesting sites in Maine; and the leasing of Bog Brook as a Wildlife Management Area to protect the nesting bald eagles, osprey, and great blue herons living there.

Public Service and Education

Interest in Maine’s endangered and nongame species is large and growing. Each year, MDIFW biologists give nearly 100 talks and slide shows to clubs, groups, and schools. They also participate in many radio and television shows about wildlife and lead numerous public field trips and training workshops. Additionally, more than a dozen new publications have been produced for the public, and hundreds of requests for information have been answered. Nine grant awards were also given in 1987 to support projects of educational value to wildlife.

The core source of funding for much of this work is the voluntary tax checkoff for endangered and nongame wildlife, nicknamed the “Chickadee Checkoff”, on the Maine income tax form. The Chickadee Checkoff has received tremendous support. More than \$100,000 has been donated each year through 1988 (Table NG2). This money has been essential to the conservation of rare and endangered wildlife in Maine.

The following pages provide more detailed summaries on several MDIFW projects currently underway for endangered or nongame wildlife.

Rare and Endangered Species Listing

In 1975, the State Legislature passed the Maine Endangered Species Act. This act gave the commissioner of the Maine Department of Inland Fisheries and Wildlife (MDIFW) the power to designate a species of wildlife as endangered or threatened in the state. It wasn’t until the Endangered and Nongame Wildlife Fund (a voluntary income tax checkoff) was established in 1983 that MDIFW had the resources to begin a comprehensive look at Maine’s wildlife to determine which species might be in trouble. Only animals that naturally occur in Maine were evaluated, and the study was limited to birds,

Table NG 2. A History of the Maine Endangered and Nongame Wildlife Fund.

Year	Total Given	Number of Givers	Average Donation	Percent of Taxpayers Giving
1984	\$115,794	25,322	\$4.57	5.34%
1985	\$129,122	29,200	\$4.42	5.96%
1986	\$112,319	26,904	\$4.17	5.41%
1987	\$114,353	26,554	\$4.31	5.19%
1988	\$104,000	25,090	\$4.00	4.75%

mammals, reptiles, amphibians, and fish. Saltwater fish, managed by the Department of Marine Resources, were not included.

With more than 450 species to review, MDIFW had a long and difficult task. Fortunately, over one hundred knowledgeable people from Maine and the Northeast volunteered their time to help in the effort. They researched each species, proposed categories, developed criteria, and recommended species to be listed within each category. A public workshop was held to give all Maine's citizens a chance to participate.

After final comments were considered at a public hearing, the revised list was approved by the Commissioner in December 1986 (Table NG1). Six categories were defined for this list. Only species included in the first two, "Endangered" and "Threatened," are protected by the Maine Endangered Species Act. Those in the remaining categories receive protection from other state and federal laws at a degree proportional to their level of risk.

This list helps MDIFW focus its efforts on species requiring special assistance. It will be reviewed regularly and updated, and someday will include invertebrates.

BALD EAGLE

The bald eagle, our nation's symbol for more than 200 years, has been recognized as an endangered species since 1978 in 43 states, including Maine. In the early 1970s, Maine's resident eagle population declined to its lowest levels; annual censuses could locate only 30-35 nesting pairs in a state that once supported hundreds of breeding eagles. A single pair in New York represented the only other nesting record in the northeastern states then.

Initial efforts to monitor and protect eagles in Maine were conducted by the U.S. Fish and Wildlife Service and several private conservation organizations. Passage of Maine's Endangered Species Act in 1975 provided a mechanism for the Department's involvement. An active research and management program has been underway in the state ever since.

The initial success of this program is evidenced in the long-term trend in Maine's breeding population (Table NG3). Steady growth has led to recent record nesting counts in the state. An annual inventory of traditional and suspected eagle nesting areas identified 109 locations inhabited by adult pairs in 1989. Unfortunately, production of young eaglets continues to lag, averaging 20 - 40% below normal rates achieved by other eagle populations.

Despite nearly ten years of a steady but gradual increase in numbers, Maine eagles have yet to approach levels of abundance or reproductive performance which indicate a safe and lasting recovery for the species.

Mounting pressures of development, and other intensive land use changes, are increasingly conflicting with habitat needs of nesting eagles. Undisturbed shorelines near coastal waters, inland lakes, and rivers are essential to a lasting presence of nesting eagles in Maine. Changes to nest sites can cause either nesting failure or abandonment of traditional nesting areas. MDIFW is pursuing opportunities for habitat protection which will insure these threats do not induce reversal of recovery trends.

Table NG 3. Bald eagle nesting and productivity in Maine, 1962-70 and 1972-87.*

Year	Occupied sites	Successful Sites		Number Young fledged	Young fledged/nest		Occupied Nests fledging number of young			
		N	%		Occupied	Successful	0	1	2	3
1962	27	8	30	8	0.30	1.00	19	8	0	0
1963	32	9	28	12	0.38	1.33	23	6	3	0
1964	28	6	21	6	0.21	1.00	22	6	0	0
1965	33	4	12	4	0.12	1.00	29	4	0	0
1966	28	7	25	11	0.39	1.57	21	3	4	0
1967	21	4	19	6	0.29	1.50	17	2	2	0
1968	23	9	39	11	0.48	1.22	14	7	2	0
1969	29	11	31	15	0.52	1.36	18	7	4	0
1970	32	8	25	11	0.34	1.38	24	5	3	0
1972	29	8	28	8	0.28	1.00	21	8	0	0
1973	31	6	19	6	0.19	1.00	25	6	0	0
1974	36	12	33	12	0.33	1.00	24	12	0	0
1975	31	9	29	11	0.35	1.22	22	7	2	0
1976	41	12	29	19	0.46	1.58	29	6	5	1
1977	50	24	48	35	0.70	1.46	26	16	5	3
1978	62	20	32	32	0.52	1.60	42	9	10	1
1979	52	29	56	38	0.73	1.31	23	20	9	0
1980	56	29	52	40	0.71	1.38	27	19	9	1
1981	63	34	54	49	0.78	1.42	29	19	15	0
1982	72	36	50	56	0.78	1.56	36	17	18	1
1983	74	40	54	60	0.81	1.50	34	20	20	0
1984	66	35	54	46	0.70	1.31	31	24	11	0
1985	85	51	59	75	0.87	1.47	35	27	24	0
1986	89	50	56	76	0.85	1.52	39	25	24	1
1987	91	46	51	65	0.71	1.41	45	28	17	1

*Data comparisons between the periods 1962-67 and 1968-85 are invalid due to variations in survey methodically, regional emphasis, and intensity.

PEREGRINE FALCON

The peregrine has been admired throughout history as the outstanding example of aerial abilities. It is renowned for rapid flying and breathtaking vertical dives while hunting smaller birds in flight.

Peregrines reside on six continents, but populations declined worldwide in previous decades due to past use of the now-banned insecticide DDT. This chemical, passed from animal to animal through food chains, severely impacted reproduction among birds of prey and fish-eating birds. In the United States, peregrine populations were nearly depleted in the West and entirely disappeared east of the Mississippi. More than 350 eyries (traditional nesting sites) from Maine to Tennessee were vacant by 1962.

The species was first bred in captivity in 1972. The Peregrine Fund, a non-profit organization which grew out of Cornell University's Lab of Ornithology, soon learned how to sustain high levels of production among captive peregrines. This resulted in a widespread restoration effort based on their small breeding stock of peregrines obtained in the wild, from the Arctic tundra to Australia. They also refined techniques for releasing young peregrines produced in captivity that were based on traditional falconry practices.

Maine became actively involved in reintroductions of peregrines in 1984 with establishment of the Department's Endangered and Nongame Wildlife Project. The state's six-year involvement has provided a significant expansion to the recovery program in the East. So far, 102 young peregrines have been released at 7 different sites in Maine. Successful releases have been conducted at cliff settings in the mountains of Baxter State Park, along the New Hampshire border, the coastal headlands of Acadia National Park, and even the "mountains" of downtown Portland.

Reintroductions are designed to maximize local survival of young peregrines. However, it is clear they will disperse to settings of their own choosing. One peregrine, last seen near a release site in eastern Maine during September, was encountered by a researcher in coastal Venezuela during mid-October of the same year! Peregrines released in Maine have been documented as resident nesters in New York City and Boston. The federally coordinated recovery program insures regional welfare of the species.

Rewards of Maine's peregrine releases are clearly apparent in this state as well. Reintroduced peregrines nested at a Piscataquis County cliff in 1987, the first breeding record since the loss of the species from the state more than 25 years ago. In 1988, peregrines successfully reared their own young for the first time at an Oxford County cliff. At least 3 pairs of peregrines raised a total of six young in 1989. We now know of 5 nesting pairs in the state. In addition, individual peregrines have been seen at 7 other locations. Thus additional gains can be expected in the future. Once again, it is possible to see the spectacular flights of the peregrine in its traditional haunts along some of the most dramatic cliff scenery in Maine.

PIPING PLOVER

Piping plovers are small, sand-colored shorebirds that nest on sandy beaches and dunes along the Atlantic Coast from South Carolina to Newfoundland. In Maine, the piping plover is listed as endangered by MDIFW because of its extreme rarity in the state and because of threats it faces during the nesting season.

Maine's population of piping plovers has been monitored annually since 1981 by biologists with the Maine Audubon Society. During this period, the

number of pairs reported has fluctuated between a low of 7 pairs at 4 sites in 1983 and a high of 20 pairs at 7 sites in 1988. Ten different nesting sites have been used during the period. The overall population trend has been one of increase, due largely to intensive management at nesting sites and favorable habitat changes at one site, Seawall Beach. However, nesting plovers disappeared from 3 sites since 1981: Batson River, Wells Beach, and Pine Point.

Productivity of piping plovers in Maine, measured as number of chicks fledged per nesting pair, has ranged from a low of 0.9 chicks per pair in 1981 to a high of 2.0 chicks per pair in 1986. Statewide productivity since 1981 has been among the highest documented in any Atlantic Coast state or province. Productivity in Maine has exceeded 1.7 chicks per pair in 4 of the past 8 years. The trend in productivity has been generally one of increase since 1981.

Monitoring and management of piping plovers in Maine has been carried out primarily by Maine Audubon Society and The Nature Conservancy biologists, with partial funding from MDIFW. Biologists conduct annual surveys of abundance and reproductive success and determine factors limiting productivity. Where necessary, nests are protected from human disturbance, pets, and natural predators such as foxes, skunks, and crows. Management in 1988 included, for the first time, use of wire enclosures to prevent nest predation by mammalian and avian predators.

Piping plovers are protected from take and harassment by the Maine Endangered Species Act of 1973 and the U.S. Endangered Species Act of 1973. A 1988 amendment to the Maine Endangered Species Act authorizes MDIFW to designate habitats essential to the conservation of endangered and threatened species, and to promulgate and enforce guidelines for the protection of these habitats. The process of determining essential habitat for the piping plovers in Maine is now underway.

LEAST TERN

Least terns are the smallest of four species of terns that nest along the coast of Maine. Least terns nest on a few sandy beaches in southern Maine. They are listed as endangered by MDIFW because of their rarity and because of threats to nesting colonies and habitat.

Nesting colonies of least terns in Maine are monitored and protected by Maine Audubon Society and The Nature Conservancy biologists, with partial funding provided by MDIFW. During the past 10 years, the statewide population has fluctuated from a low of 39 pairs at 3 sites in 1982 to a high of 124 pairs at 4 sites in 1986. Since 1979, total productivity in Maine has ranged from 12 to 82 young fledged annually.

Threats to nesting colonies of least terns in Maine include human disturbance, destruction of nests or young by humans, foxes, skunks, raccoon, crows, dogs, and cats, and habitat alteration from coastal development. Management of least terns in Maine includes protection of nesting colonies with symbolic fencing, snow fencing, or chicken wire. Symbolic fences are fences of stakes and twine with warning signs around the nesting colonies. Public education to inform recreational beach-goers and local residents about the conservation needs of least terns is another important management activity.

GRASSHOPPER SPARROW

Grasshopper sparrows are considered endangered by the MDIFW because of low numbers and threats to their habitat. Maine is at the extreme northeastern edge of the range of the grasshopper sparrow. The species is known to nest at only four locations in the southern part of the state. Grasshopper sparrows inhabit large sandy grasslands and blueberry barrens that are vegetated with sparse bunch grasses. These habitats are also rare in Maine.

The largest nesting population of grasshopper sparrows in Maine occurs on 600 acres of blueberry barrens and grasslands on the Kennebunk Plains in West Kennebunk, York County. Less than 20 nesting pairs occur on the Kennebunk Plains, and this population has declined over the past four years. This decline is presumably a result of habitat changes brought about by use of herbicides to encourage establishment of a blueberry monoculture.

The Kennebunk Plains is in the process of being purchased by the Land For Maine's Future Board, in cooperation with The Nature Conservancy, the Kennebunk Water District, and MDIFW. The property will be managed by MDIFW as a Wildlife Management Area. Habitat restoration for grasshopper sparrows and other grassland birds will be a high priority.

AMPHIBIANS AND REPTILES

Thirty-eight kinds of frogs, toads, salamanders, snakes, and turtles are known to live in Maine. Collectively called herptiles, or "herps" for short, these animals are some of the smallest, most inconspicuous, and perhaps least understood of all vertebrate species. A few of them are also among the rarest of Maine's wildlife.

Very little has been known about reptiles and amphibians in Maine. In 1984, MDIFW, The Nature Conservancy, Maine Audubon, and the Wildlife Department of the University of Maine initiated the Maine Amphibian and Reptile Atlas Project (MARAP). Now in its fifth year, the project has enlisted

the aid of many enthusiastic and dedicated volunteers to record observations of both rare and common herps. Information collected by MARAP observers is already increasing our knowledge of amphibians and reptiles in Maine. New locations for some of our rarest herps have been documented.

MDIFW has also funded several independent surveys targeting endangered and threatened herps. As a result, several new sites have been identified, and at least one reproducing population of Blanding's turtles has been verified. This information will serve as a starting point from which to assess species status and develop conservation strategies.

Four species are of special interest to MDIFW. In 1986, the black racer snake and eastern box turtle were officially listed as Endangered Species in Maine. The spotted turtle and Blanding's turtle were listed as Threatened. All of these species are at or near the northern edge of their range in Maine and probably were never very common.

Black racers are Maine's largest snake, reaching a length of five feet or more. Shiny, jet black in color, slender, and very fast, this species is an inhabitant of open fields, farms, swamps, forests, and woodland edges. It is known to exist in less than ten Maine locations, all in York and southern Oxford counties, and is believed to be declining in range and numbers. Habitat loss, particularly from development, is the major threat to black racers in Maine today.

Box turtles are perhaps the rarest species, and their status is the least well known of Maine's herps. A terrestrial species, this turtle is found primarily in moist woodlands, meadows, and riparian areas. It is long-lived, capable of surpassing 100 years of age. Box turtles are often kept as pets, and are frequently imported from other states. At this time, it is impossible to distinguish native box turtles from "escapees", consequently, the five or six sightings of box turtles in Maine during the past several years may not represent the current status of this species. Both habitat loss and over collecting are believed to have caused the box turtle to become endangered in Maine, and still threaten the species today.

Both of Maine's Threatened herps, the spotted and Blanding's turtles, are aquatic species preferring clean, shallow waters with abundant vegetation. They are known to occur at the same sites. While spotted turtles are characterized by yellow spots on their slightly flattened upper shell, Blanding's turtles are flecked with yellow streaks on a more helmet shaped shell, and have a bright yellow patch on their chin and throat. There are less than ten known locations for Blanding's turtles in Maine, all in York County. Spotted turtles are recorded from about ten different sites and have been documented as far east as Woolwich. Loss of habitat, primarily draining and filling of wetlands, is the most serious threat to these two species.

Through MARAP and other independent studies, MDIFW will continue to collect information about Maine's herps. MDIFW will also develop species assessments and management systems for each of the key species during the next two years.



GAME BIRDS

Maine game birds are called either resident or migratory based on their behavior. For administrative convenience, it is easier to deal with these two groups separately.

Migratory game birds are managed in accordance with the Migratory Bird Treaties between the United States and other Nations. Laws which implement these treaties assign the Secretary of the Interior responsibility for protection of migratory bird populations.

Resident game birds are the sole jurisdiction of the State of Maine. These species include the ruffed grouse (or "partridge") and the wild turkey which, incidentally, is classified as a big-game species by Maine law. Ring-necked pheasant populations also exist at low levels, but only where food and weather conditions permit winter survival. These small wild populations are augmented by a small annual release of game-farm pheasants. Another resident upland game bird (not hunted in Maine) is the spruce grouse.

The remaining game birds of interest to Maine hunters are migratory species. Upland migratory birds include American woodcock and common or Wilson's snipe. Of lesser importance to Maine gunners are the Virginia and Sora rails, the American coot, and the common moorhen. Waterfowl as a group are also migratory birds. Maine waterfowl include various species of inland breeding ducks, Canada geese, and coastal breeding common eiders. The mourning dove, although not hunted in Maine, supports the largest harvest of any migratory bird in North America. Maine's dove populations are monitored annually through breeding surveys designed to follow population trends.

WILD TURKEY

Historical records document the existence of wild turkeys in coastal areas of Maine as far east as the Penobscot Bay area. Unfortunately, the last of Maine's native wild turkeys disappeared in the late 1700s or early 1800s because of unrestrictive hunting and extensive forest-clearing. The reversion of thousands of acres of farmland back to wooded habitat has greatly enhanced the prospects for reestablishment of wild turkeys into former ranges.

As early as the 1960s, Maine sportsmen began "thinking turkey". Fish and Game clubs in the Bangor and Windham areas made attempts to reestablish turkeys into their areas using birds raised from part wild and part game-farm stocks. The Bangor stocking was unsuccessful, and the Windham population persisted in low numbers into the 1980's.

In the 1960's and 1970's, considerable work was done in other states to establish wild turkeys into former and new ranges of suitable habitat. Researchers noted the key to each success was to remove a small number of wild birds from one site and release them into suitable unoccupied habitat.

Maine too became involved in a similar program in 1977 when Department biologists acquired 41 wild turkeys from Vermont and released them in York County. By the early 1980s, the York County population had become large enough to serve as a source for birds for new release sites. In the spring of 1982, 33 birds were captured in York County and released in Waldo County. In the winter of 1984, 19 additional birds were captured in York County and released in Hancock County.

The Waldo County release was successful and resulted in a stable population that persists today. Unfortunately, the Hancock County wild turkeys failed to produce a self-sustaining population. Several factors appeared to contribute to the failure, but illegal shooting was believed to be the major cause.

Hunting Seasons

By 1986, the York County wild turkey population had increased to a sufficient size to allow a spring (males only) hunting season. Wild turkeys, like white-tailed deer, are polygamous, meaning that only the dominant males in the population mate with the females. The remaining males are considered surplus. Courtship activities for wild turkeys in Maine begin in April and last into early May. The spring hunting season is timed to begin after the breeding period is over, and it is limited to bearded turkeys only. Experience has shown that spring turkey hunting provides a quality big game hunting opportunity without jeopardizing restoration efforts.

Each spring, a maximum of 500 hunters are allowed to hunt wild turkeys for approximately 2 weeks in the area south and west of the Ossipee and Saco Rivers. The harvest is limited to taking bearded turkeys only, and generally occurs (depending on spring weather) after the breeding season. Many hunters have enjoyed this new spring recreational activity, and during the past 4 seasons, 9, 8, 16, and 19 birds have been taken, respectively (Table GB1). The low number of harvested birds is a true testament to the wariness of this magnificent game bird.

Management and Research

In recent years, emphasis has been placed on introducing wild turkeys into all suitable habitat between York and Waldo Counties. A "leap frog" trap and transfer technique has been initiated with a goal of eventually joining these two populations.

Table GB 1. Wild turkey hunting effort and harvests, 1968-89.

Year	Number of Applicants	Number of Permits	Wild Turkeys Harvested
1986	536	500	9
1987	519	500	8
1988	355	355	16
1989	463	463	19

Our efforts were augmented in 1987 and 1988 by the release of 70 wild turkeys captured in Connecticut. These Connecticut turkeys were released at a number of sites in York and Cumberland County in a northward progression. At that time, we believed that it was necessary to get as many wild turkeys “on the ground” as possible. The addition of wild birds from a different stock was believed necessary to improve reproductive success. However, it is important to note that rearing and releasing “game farm” strains of wild turkeys can seriously impact the future success of this program, and it is not allowed by the Department. Birds from these strains do not survive and reproduce well in the wild and they only introduce inferior breeding stock into wild populations.

We remain optimistic that this goal-oriented reintroduction program will succeed in reestablishing wild turkeys into all suitable habitat in Maine. We are indeed thankful for all the cooperation, financial support, and hands-on participation we’ve received from the public, L.L. Bean Inc., and especially the Maine Chapter of the National Wild Turkey Federation.

Individuals interested in becoming involved in wild turkey management are encouraged to contact the Maine State Chapter of the National Wild Turkey Federation, South Windham, Maine 04082.

RUFFED GROUSE

The ruffed grouse (partridge) is generally considered the number one game bird in Maine. Data collected in Maine in the early 1980s show that an estimated 100,000 hunters harvest over 500,000 grouse annually. While no data exist on recent harvests, successful hunters report grouse to be even more numerous in many areas now than they were at that time. This should not be surprising, as grouse populations are well known for their periodic cycling between high and low numbers.

Ruffed grouse are a product of the forest. The amount and quality of Maine’s forests are constantly changing, and the impact of these changes on grouse populations are difficult to predict. Fortunately, however, the future for the ruffed grouse appears bright. Timber harvesting is revitalizing grouse habitat as more and more commercial timber companies, State and private foresters, and small woodlot owners are utilizing harvesting practices which improve or sustain habitat for this species.

RING-NECKED PHEASANT

Lack of suitable habitat and severe winter weather limit distribution of the ring-necked pheasant in Maine. As a result, Maine hunters have few opportunities to pursue wild populations of this popular game bird. Most pheasants taken in Maine are from game-farm stock annually purchased and reared for release prior to the hunting season.

Funding for the Department's pheasant stocking program is derived entirely from the sale of a pheasant hunting stamp. The stamp is required to legally take ring-necked pheasants during the hunting season. Income from the sale of pheasant stamps is used to purchase a small number of six-week old birds from commercial game-farms.

Volunteer pheasant cooperators provide labor, pens, and food for the Department-owned birds. These cooperators accept the Department's young pheasants and raise them for release in the fall. It is safe to say that without the contributions of these cooperators, there would be no stocked pheasants for Maine hunters.

These birds are released just prior to the hunting season and are available to any licensed Maine hunter who has purchased the state pheasant stamp. Locations of the release sites, and the dates of release, are determined by the cooperators. Release conditions are, however, first approved by the Regional Wildlife Biologist.

Reduced annual sales of the pheasant stamp have resulted in a gradual decline in the number of birds available for stocking each year. The number of pheasants purchased annually for release by cooperators during the past five years was 2,885 in 1984, 1,734 in 1985, 1,575 in 1986, 1,833 in 1987, and 1,890 in 1988.

In 1989, a bid was approved for the purchase of 1,533 six-week old pheasants. These birds will be raised for release by 15 cooperators.

WOODCOCK

Hunting Season

A rangewide decline in woodcock numbers during the early 1980s, caused primarily by two successive years of heavy April snowfalls on the woodcock's breeding grounds, has resulted in more restrictive hunting regulations. In 1985-86, eastern states were required to shorten their woodcock hunting seasons, select opening dates no earlier than 1 October, and reduce the daily bag limits from 5 birds to 3. These hunting season restrictions have been in place since the 1985 season.

While rangewide populations continue to decline at approximately 2 percent each year, Maine's singing-ground survey results are more encouraging (Figure GB1). This recent favorable trend (albeit a short one) is largely due to a number of factors beyond our control. In the past few years, general spring weather conditions have been favorable for nesting and brood rearing. These factors, coupled with rangewide conservative harvests, play an important role in woodcock population recovery.

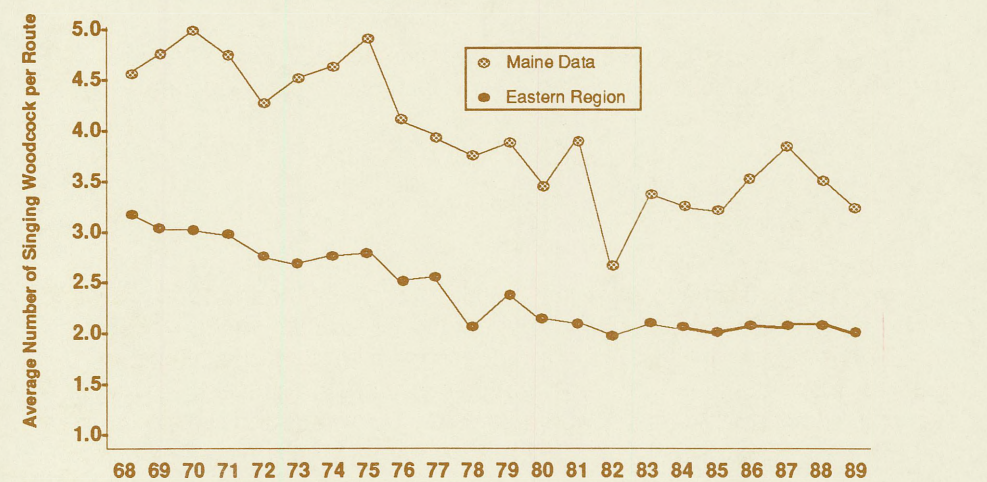
In 1987, the most recent year that federal data is available, an estimated 4,200 hunters harvested about 27,500 woodcock in Maine. This estimate is believed to be very conservative when compared to the estimate derived from the Department's last Hunter Questionnaire of 24,000 hunters harvesting at least 100,000 birds during 1983 in Maine.

Management and Research

There is increasing concern for the woodcock throughout its range. During the last 20 years, interest in woodcock hunting has grown steadily, and until very recently, rangewide harvests have increased. In the northeast, particularly, this increase in hunting pressure came at a time when woodcock habitat was being lost to urban and industrial development, and a large amount of forestland grew into stages not suitable for woodcock. The rangewide population decline can be seen graphically in the Eastern Region's Singing-ground Survey results for the last two decades (Figure GB1).

In recent years, interest has turned to commercial timberlands as being a potential bright spot for woodcock habitat. While the soils may not be as productive as abandoned farmland, the vast acreage of young forests created

Figure GB 1. Breeding population index for woodcock, 1968-89.



* FWS data, 1989 Administrative Report

by commercial clearcuts warrant attention. Wildlife managers and commercial foresters now have the opportunity to manage the forest for woodcock by following recommendations published by various research biologists, including those at the Moosehorn National Wildlife Refuge.

WATERFOWL

Hunting Seasons

Waterfowl harvests have been declining since 1981. This has been partly by design, but it also reflects declining hunter numbers and fewer waterfowl. The estimate of waterfowl hunters in Maine has been declining since 1978, when the high of 18,650 Federal migratory bird hunting stamps were sold in Maine. The average number of stamps sold to Maine hunters in 1986 and 1987 was approximately 12,700 and the preliminary estimate for 1988 dropped to 10,597 (Table GB2).

Recently (1983-1988), black duck harvest restrictions have been implemented in the U.S. and Canada. Black duck harvests have been reduced in the U.S. by 42% since the 1977-81 period, and the black duck kill in Maine has also been reduced 61% (Table GB3).

Over half of all ducks bagged by Maine gunners in 1987 were dabbling ducks, about 30% were sea ducks, nearly 12% were diving ducks, and the rest were mergansers (Table GB4).

Table GB2. Maine and Atlantic Flyway Waterfowl Harvests and Duck Stamp Sales 1976-1988.

Year	WATERFOWL HARVEST		DUCK STAMP SALES	
	Maine	Atlantic Flyway	Maine	Atlantic Flyway
1976-80 average	83,360	1,941,460	17,444	429,533
1981	74,000	1,889,900	16,657	407,906
1982	75,000	1,608,700	14,470	402,929
1983	85,900	1,669,800	14,685	390,896
1984	61,600	1,810,500	13,634	412,866
1985	69,400	1,400,600	13,280	382,546
1981-85 average	73,180	1,675,900	14,545	399,429
1986	73,400	1,412,500	13,185	387,744
1987	54,800	1,388,800	12,274	367,049
1988*	40,400	922,100	10,597	315,611

* preliminary estimate

The decline in duck harvest caused by regulation changes during the last few years has primarily affected the kill of dabbling and diving ducks. The 1987 kill of sea ducks and mergansers was very close to the ten-year average for these groups, while the harvest of the dabblers and divers was down by nearly 39 percent.

Table GB 3. Maine and Atlantic Flyway Black Duck Harvest Data 1977-1987.

State	Black Duck Harvests		
	1977-81 Average	1983-87 Average	Percent Change
Maine	20,820	8,080	- 61
Vermont	6,420	4,120	- 36
New Hampshire	6,940	4,940	- 29
Massachusetts	24,540	16,260	- 34
Connecticut	8,140	4,200	- 48
Rhode Island	5,680	2,620	- 54
New York	43,920	28,340	- 35
Pennsylvania	11,040	5,640	- 49
West Virginia	1,120	540	- 52
New Jersey	37,220	22,760	- 39
Delaware	9,760	5,720	- 41
Maryland	29,400	14,960	- 49
Virginia	19,040	12,760	- 33
North Carolina	11,140	5,900	- 47
South Carolina	7,240	3,500	- 52
Georgia	2,360	1,460	- 38
Florida	860	294	- 66
Atlantic Flyway	245,640	142,094	- 42

Research and Management

The 1985 species assessments combined the earlier Canada goose and wild duck species plans into one document. The most significant change in the latest revisions of these plans was the change from harvest oriented to breeding population oriented goals and objectives. These changes have resulted in a more coordinated and responsive program for waterfowl management in Maine.

Maine waterfowl are now being managed to increase certain breeding populations. Low populations of black ducks have recently caused major changes in regulations which altered traditional hunting seasons in Maine.

More recently, declines in North American waterfowl populations have resulted in further curtailment of waterfowl hunting seasons and bag limits. These declines have been caused by prolonged and severe droughts in the prairie regions of the U.S. and Canada. The decade of the eighties has not been bright for waterfowl hunters or populations.

Table GB 4. Species Composition of Maine's Waterfowl Harvest — 1987 and Average Harvest 1976-85.

Species	1987 Estimates		Average Harvest 1976-85
	Percent	Harvest	
Common Merganser	1.87	1,030	684
Red-Breasted Merganser	0.10	56	402
Hooded Merganser	1.83	1,010	1,166
Sub-total Mergansers	3.80	2,096	2,252
Mallard	9.01	4,968	4,850
Mallard-Black Hybrid	0.37	205	471
Mallard (hand reared)	0.09	50	174
Black Duck	10.70	5,896	18,182
Gadwall	0.09	50	33
American Widgeon	0.18	98	293
Green-winged Teal	11.99	6,611	9,159
Blue-winged Teal	1.64	902	2,061
Northern Shoveler	0.00	0	13
Pintail	0.51	279	451
Wood Duck	18.81	10,371	10,568
Sub-total Dabblers	53.39	29,430	46,255
Redhead	0.00	0	10
Greater Scaup	0.18	98	240
Lesser Scaup	0.10	56	315
Ring-necked Duck	3.41	1,880	3,119
Common Goldeneye	4.51	2,488	3,538
Barrow's Goldeneye	0.15	83	123
Bufflehead	3.46	1,910	5,304
Ruddy Duck	0.00	0	58
Sub-total Divers	11.81	6,515	12,649
Old Squaw	3.92	2,160	1,395
Harlequin	0.00	0	7
Common Eider	18.75	10,337	9,779
King Eider	0.00	0	16
Common Scoter	0.52	288	1,211
White-winged Scoter	2.58	1,421	2,174
Surf Scoter	5.22	2,880	2,447
Sub-total Sea Ducks	30.99	17,086	17,029
All Species	99.99	55,127	78,185

One method used to increase waterfowl populations in Maine has been to eliminate, where and when possible, significant forms of non-hunting mortality. Lead poisoning of waterfowl is an example of this type of mortality. This national problem affects many thousands of birds annually.

Studies in Maine during 1985 and 1986 revealed significantly high numbers of waterfowl had ingested lead pellets or absorbed lead salts into their livers.

These findings convinced the Commissioner's Fish and Wildlife Advisory Council to phase in the use of nontoxic shotshells for all waterfowl hunting in Maine over three hunting seasons (1986-1988).

Maine hunters had their first statewide steel shot hunting season in 1988. This was three years ahead of the deadline required by the U.S. Fish and Wildlife Service's National plan. Maine hunters have accepted the facts and shouldered the responsibility for using the latest in shotshell technology. Many were pleasantly surprised with their results. These new steel loads and shot combinations have proven to be effective for Maine conditions.

Habitat protection and enhancement efforts are another form of management which the Department is using to increase waterfowl breeding populations. Revenues generated from the sales of state waterfowl hunting stamps and art prints have been dedicated to acquisition and development of wetland habitat.

Coordination of Maine habitat protection efforts among several state and federal agencies, and private organizations has resulted in some key land purchases which will benefit Maine waterfowl now and in the future. The stimulus for this coordinated effort has been the implementation of the North American Waterfowl Management Plan and its various Joint Ventures.

The Atlantic Coast Joint Venture area includes all of Maine's inland and coastal wetlands. The emphasis for habitat protection in this joint venture is for significant migration, wintering, and production areas. Maine's waterfowl habitats were grouped into five focus areas which were ranked for their wildlife value and habitat protection needs. Efforts to secure protection will be directed toward the most significant and vulnerable areas first.

The Cobscook Bay focus area and the Merrymeeting Bay - lower Kennebec River focus area are the two priority regions selected for first step projects in Maine. Initial efforts in these areas have resulted in a coordinated plan to secure protection for these important ecosystems. The east coast region (Penobscot Bay east), west coast region (west of Penobscot Bay), and inland wetlands focus areas will be considered as implementation of the North American Waterfowl Management Plan proceeds.

Current waterfowl research efforts are aimed at measuring and tracking trends in breeding populations and the harvests they support. Developmental studies are currently underway to determine the best way to survey pairs of breeding coastal eiders and inland waterfowl.

Statewide surveys of waterfowl production are also continuing as a measure of population status. These long-term brood count surveys have provided a means of following trends in waterfowl breeding populations since the mid-1950's.

PRIVATE LANDS VITAL TO WILDLIFE ABUNDANCE AND ENJOYMENT

In Maine, where only 5 percent of the total land area is in public ownership, the private landowner's role in wildlife management cannot be overstated. The underlying fact is that most wildlife in this state is produced on privately-owned land. It is also on land owned by others that most people take their enjoyment of wildlife.

The way landowners use their property has a significant bearing on the abundance and diversity of most game and nongame species, and the very existence of some land-intensive forms of recreation, such as hunting, is heavily dependent on the good will of these individual and corporate landowners.

Much of northern Maine is in large forest and agricultural ownerships, while elsewhere family farmers and small woodlot owners dominate rural ownership patterns. These owners of 95 percent of the land in this state have a long history of stewardship and of sharing their land with others for recreational uses.

Despite additional acreages of private property being closed annually to public recreation — largely the result of thoughtless acts by recreational users — there still remains abundant opportunity for public recreation on privately owned land in Maine.

Preserving the tradition of easy access to private property will take diligence by all concerned, but particularly it means that land users must treat the land and its owners the same way they would want someone else to treat their private property: with care and respect.

ACKNOWLEDGEMENTS

The Wildlife Division consists of a Regional Management Section and a Resource Assessment Section. Both groups contribute in various ways to the overall management of our wildlife resources.

This report summarizes only a portion of the activities of the Wildlife Division work program, a program that is constantly being refined to be more efficient and effective.

Because of the dedication of the men and women of the Wildlife Division, the wildlife management process in the state of Maine is used as a model throughout the Northeast.

We would like to extend special thanks to the staff of the Division of Public Information and Education for creating this finished report from a draft manuscript.



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