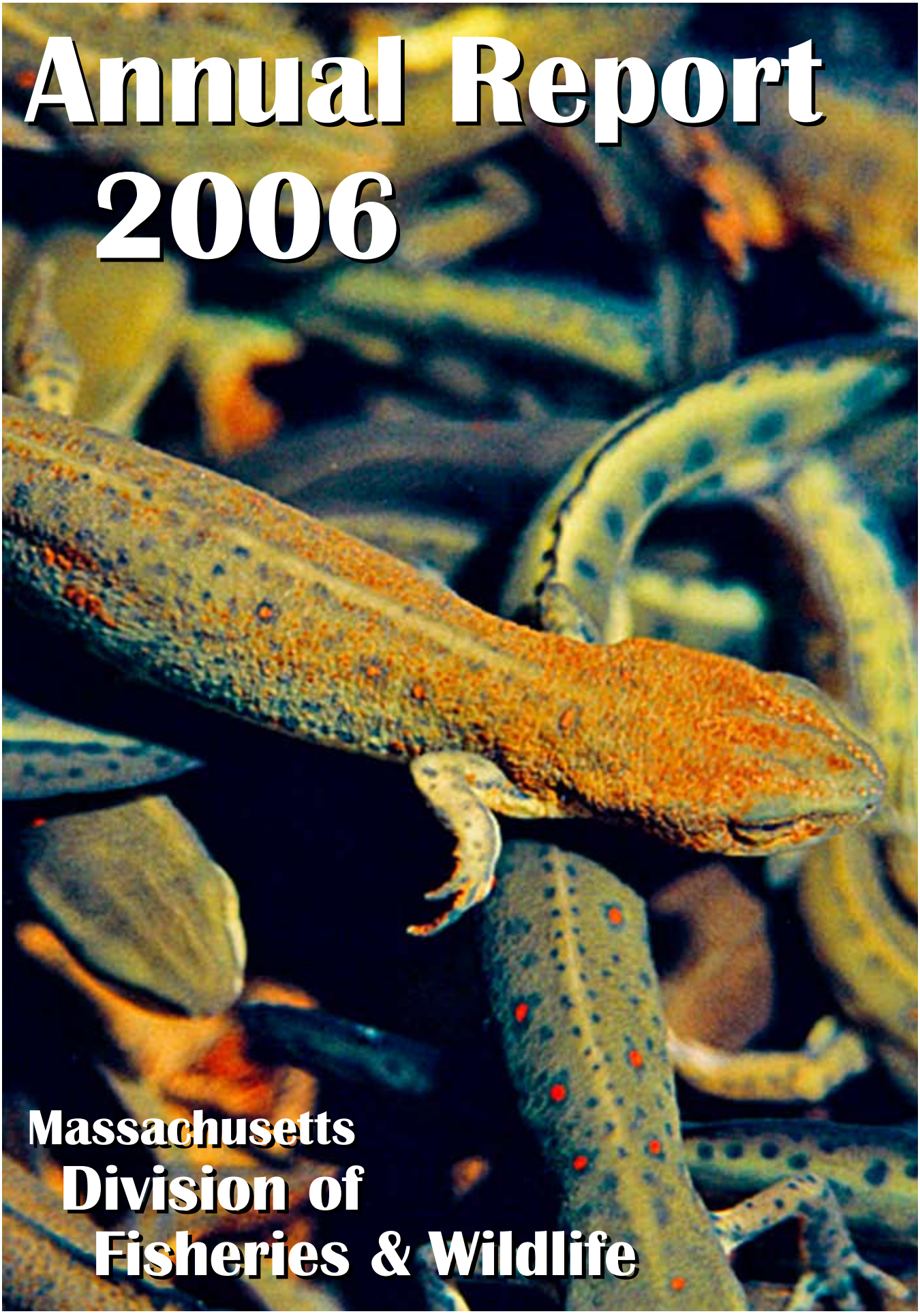
Annual Report 2006



Massachusetts
Division of
Fisheries & Wildlife

Annual Report 2006

Massachusetts Division of Fisheries & Wildlife

Wayne F. MacCallum
Director

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Deputy Director
Administration

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Deputy Director
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Table of Contents

About The Cover:

A rare winter congregation of eastern (red-spotted) newts, *Notophthalmus viridescens*, defies explanation. Photographed under 3 inches of Worcester County ice, these adult, aquatic amphibians (which also have a terrestrial "red eft" life stage), are gathered within a pile of beaver cuttings about 18 inches down in a shallow marsh. The phenomenon has only been documented a few times and its cause remains unknown. A diving mask served as an improvised housing to break the surface of the water, and a single off-camera flash was used to get this shot. A 6-18 inch hole in the ice was maintained even at 10° F temperatures by active newts that came to the surface to gulp air. Detail, left, shows approximately one third of the mass. Photo © by Bill Byrne

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THE BOARD REPORTS

George Darey
Chairman

The Massachusetts Fisheries and Wildlife Board is a group of seven persons, each selected for a demonstrated interest in wildlife. By law, the persons appointed to the Board are volunteers, receiving no remuneration or expenses for their service to the Commonwealth. Five of the seven are selected on a regional basis, with one member, by statute, representing agricultural interests. The two remaining seats are held by a professional wildlife biologist or manager, and a representative with a specific interest in the management and restoration of those wildlife populations not classified as game species. Each member is appointed by the Governor to a five year term. The Board oversees operations of the Division of Fisheries and Wildlife, reviews the agency's programs, and sets policy and regulations pertinent to wildlife in the Commonwealth.

The Board has continued its tradition this year of holding monthly meetings at locations around the state, holding public hearings on proposed regulatory changes, and addressing many issues of specific concern. While many different matters and issues were brought before the Board this year, most of its time was spent in scrutiny and review of agency programs and proposals for regulatory changes. Among the items examined were:

Endangered, Threatened and Special Concern Species

The Board heard a summary of proposed changes to the list of endangered, threatened and special concern species from Assistant Director Dr. Tom French. There were 16 proposed changes: the addition of three plants; the deletion of two vertebrates, six invertebrates and three plants; and status change to two plants. The most contentious of these proposals was the Staff recommendation to de-list the Spotted Turtle. The Natural Heritage and Endangered Species Advisory Committee reported that the lack of good quality data did not support a scientific recommendation to de-list; however, the Committee also noted that were the animal to be proposed for listing today, it would not meet the qualifications for inclusion. The Board held a public hearing in April to solicit public comment on the proposals, and following discussion and consideration of the comments received, the Board voted to accept all the proposed changes as presented.

Deer Management Regulations & CWD

After hearing a presentation from Deer Project Leader Bill Woytek covering the 2005 deer harvest, the Board voted unanimously to approve staff recommendations for antlerless permit allocations for the 2006 season. It also voted to hold the permit drawing at the Mahar Regional School in Orange this year.

The Board heard a report on the status of Chronic Wasting Disease during the previous fiscal year, and was alarmed to hear that this contagious (among deer) disease has now been detected in central New York. In view of that report, the Board voted unanimously to instruct the Director to implement emergency regulations to prohibit any deer parts other than deboned meat, antlers, cleaned hides and skullcaps from being brought into Massachusetts from states in which CWD occurs. A public hearing was scheduled to consider permanent regulations pertaining to the importation of deer carcasses from CWD-infected states, and to prohibit the importation of any members of the deer family, including moose and elk. Following review of comments and discussion with the Office of Law Enforcement, the Board voted unanimously in September to make the regulations permanent.

The Board also heard a proposal to extend the shotgun deer season from 6 days to 12 days on Martha's Vineyard. A public hearing was held on the island in May, and the Board thoroughly reviewed the subsequent comments. The majority were in favor of the extension, and many expressed concern about the high incidence of tick borne disease. The Board voted unanimously to extend the season, and made the change effective for the 2006 season.

Nantucket Special Hunt

The Board held its November meeting of the previous fiscal year on Nantucket at the request of town officials. This included a proposal for special deer hunting regulations, as well as a public hearing. Deputy Director Rob Deblinger presented a history of deer hunting on Nantucket, including results, and explained the hunter access and hunter effort that would be required to reduce deer numbers on the island. The town Selectmen had requested a special season: a 12 day season in February that would require permits and closure of the rabbit season during the period. After considering public comment and in view of the fact that this proposal involves a public health issue, the Board voted unanimously to authorize a special deer season in February, but in view of local concerns, the proposed two week season on Nantucket was reduced to one week.

The special hunt went as planned thanks to great effort on the part of staff and Law Enforcement, result-

ing in a total deer harvest on Nantucket of about 800 deer, 246 of which were taken during the special hunt. Some of Nantucket's Selectmen were replaced since the hunt, however, and the Board received a request from them to cancel the hunt for 2006. A public hearing was scheduled and the Board spent considerable time reviewing and discussing this contentious issue, noting that the deer resource was healthy, that a public health problem (Lyme disease) was evident and scientifically documented on the Island, and that a great deal of staff time and research had been devoted to addressing disease reduction through the special hunt. In view of the fact that the local government no longer wants the disease reduction/deer management it had originally requested, however, and since the herd itself is healthy, the Board voted to rescind the regulations allowing the special hunt. Since the disease will not be reduced, however, and the Island will continue to harbor an exceptionally high density of deer ticks, the Board sent a letter to the Selectmen recommending that they take appropriate steps to post at every point of entry to the Island a public advisory to the effect that there is a tick borne disease on Nantucket.

Quabbin Lake Trout Regulations

The Board heard a presentation by Aquatic Biologist Todd Richards on Quabbin Reservoir's 5-year Experimental Slot Limit for lake trout. He provided an excellent review on this historical trophy fishery, an assessment of the slot limit, and information on lake trout habitat, age and growth. He reported on sampled lake trout which grew only a quarter inch per year and gained less than two ounces per year. Staff concluded that the slot limit had failed to achieve its intended goals and recommended rescinding the slot limit and returning to the 18 inch, two fish daily limit. A public hearing was held on this proposal in June, and the Board will vote on it early in the coming fiscal year.

Youth Pheasant Hunt

During the previous fiscal year the Board heard a presentation on a proposal to establish a Massachusetts Young Adult Pheasant Hunt Program. The program is designed to provide young hunters with a fun and enjoyable experience that includes gun safety, shooting practice, cleaning and cooking game, and a day in the field with an experienced hunter. The Board was in complete agreement with the goals and activities involved, and voted unanimously to adopt the program. Staff recommended two minor regulatory changes to implement the program; namely, to allow youths to take two pheasants instead of one, and to change "October 20th" in the regulations to the "Saturday after Columbus Day." A public hearing was held in July, and following consideration of comments received, the Board voted unanimously to accept the recommendations as presented.

Pheasant Review

In response to recommendations submitted to the Board by the Ad Hoc Upland Bird Committee, the Board requested and received a complete overview of the agency's Pheasant Program from Assistant Director Tom O'Shea. The Division stocks 40,000 of these game birds annually, plus provides significant numbers of birds to cooperating sportsmen's clubs. In response to comments received from pheasant hunters, staff made the following recommendations to improve the program: (1) focus stocking on quality sites; (2) increase stocking frequency; and (3) manage upland habitats. The Board voted unanimously to endorse the recommendations as presented by staff.

Forest Reserves

Forester John Scanlon provided the Board with a thorough review of forest management and forest reserves on MDFW lands. Thanks to the agency's able forestry work, it is the first in the nation to achieve green certification. Working with several Board members in a working group, the staff offered a proposal to:

- establish 11.5% of MDFW lands in a combination of patch and matrix reserves;

- establish matrix reserves totaling 8,270 acres on portions of the Chalet complex, Jug End and Hiram Fox W.M.A.s in conjunction with DCR;

- establish patch reserves totaling 7,300 acres in conjunction with agency staff. The Board voted unanimously to endorse the recommendations as presented.

Waterfowl Regulations

The Board heard its annual presentation from Waterfowl Project Leader H Heusmann on the framework and proposed season dates, bag and possession limits for the 2005 waterfowl seasons. The only significant change from last year was a reduction of the bag limit on scaup from three to two. Following a public hearing on these proposals, the Board voted unanimously to accept them.

Comprehensive Wildlife Conservation Strategy

The Board was pleased to receive a draft copy of the Comprehensive Wildlife Conservation Strategy from CWCS Coordinator John O'Leary during the previous fiscal year. The draft was released to the public for review and comment, and more than a dozen comments were received, considered and incorporated into a refined final draft, which the Board accepted and approved at its August meeting this year. The CWCS then went to the National Review Team for acceptance, which is necessary to qualify for the State Wildlife Grant. The Board has full confidence in this plan, which was recognized by Defenders of Wildlife as one of the top 12 such plans in the country, and commends all the staff involved in producing this exceptionally important document.

Black Bear Regulations

Late in the previous fiscal year the Board heard a review of the status and history of black bear regulations by Jim Cardoza, Bear Project Leader, and a staff recommendation to (1) allow black bear hunting during the two week shotgun deer season; and to (2) change county-based boundaries to zone based boundaries to allow bear hunting in Wildlife Management Zones 1-9. A public hearing on these matters was held in July. Staff reviewed all comments and, while retaining the Wildlife Management Zone 1-9 change, after consideration decided to reject the recommendation for bear hunting during the shotgun deer season and instead add 2 weeks to the November bear season with the new season opening on the first Monday in November. The Board voted unanimously to accept the recommendations and to make them effective for the 2006 season.

The Board addressed another issue concerning black bear, noting that, as the population expands eastward, individual bears are frequently making the news, usually by simply appearing where they haven't been seen before and destroying birdfeeders. The Board felt the issue of feeding bears needed to be addressed, as the problems this practice creates is only going to increase. The Board therefore voted to present a model of guidance to cities and towns regarding the feeding of wildlife.

Miscellaneous

The Board is very pleased with the ever improving relationship between the MDFW and the Division of Law Enforcement and voted to send a letter of support to the Secretary of Environmental Affairs requesting adequate staffing for the Division of Law Enforcement.

The Board was also very pleased to view a slide presentation by MDFW Restoration Ecologist Tim Simmons on controlled burns and their application to wildlife and habitat management. It was gratifying to learn that various state agencies and environmental groups are working cooperatively on these projects. The Board also heard an updated review of the Landowner Incentive Program by LIP Coordinator Ken MacKenzie, and hopes that sportsmen's clubs as well as individual private landowners and trusts will take advantage of this innovative program to benefit both themselves and wildlife. The Board also enjoyed informative presentations on: the Fisheries Habitat Conservation and Restoration Program and the protection of coldwater fisheries resources (Todd Richards); a summary of the Important Bird Areas (IBAs) program established by MassAudubon in 2001 (Tom French); a summary of forestry conservation management practices developd for rare species (Leslie Bol); a review of the Hunter Safety Program provided by Hunter Education Coordinator Sue Langlois; a summary of the process and results of the agency's Land Acquisition Program by Habitat Protection Specialist Lynn Harper; and review of a video on the sustainable forestry practices at Cowl's Lumber Yard in North Amherst.

The Board is also very pleased with the work of members Drs. Larson and Van Roo, who drafted a letter the Board sent to the Secretary of Environmental Affairs expressing the Board's commitment to Green Certification of the MDFW's forestlands. The Board also commends Secretary Pritchard, Commissioner Peters and Director MacCallum for their successful efforts in acquiring funding to renovate and repair Westboro Field Headquarters and District offices.

The Board voted on the recommendation of Commissioner Peters to re-appoint Dr. Stephen Meyer and Jonathan Shaw (full members) and Wayne Petersen and Mark Pokras (associate members) to the NHESP Advisory Committee, and to appoint Brian Windmiller to serve as an associate member in place of Brian Cassie. It also voted to nominate former Board member Russ Cookingham for the 2006 Francis Sargent Award in view of his distinguished career and long service to wildlife conservation, and was very pleased to present Mr. Cookingham with this award in March.

FISHERIES

Mark S. Tisa, Ph.D.
Assistant Director for Fisheries

Introduction

According to the 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, more than 278,000 Massachusetts residents age 16 and older fished in freshwater during 2001. Additionally in 2001, more than 47,000 nonresidents fished the state's lakes, ponds, rivers and streams. The average angler in the Commonwealth fishes 14 days a year and spends $632.00 on direct and indirect expenses. Fishing pressure in Massachusetts is estimated at 40 trips/acre versus the national average of 27 trips/acre. The American Sportfishing Association estimated expenditures of $274,273,777 for freshwater recreational fishing in Massachusetts, an activity that generated over $26 million in sales tax revenue and created some 5,636 jobs in 1996.

The Commonwealth's aquatic resource inventory includes a variety of both lotic and lentic fisheries habitat that provide a wide range of sport fisheries from coldwater, wild trout to warmwater panfish. There are approximately 2,675 lakes and ponds, totaling about 142,681 surface acres. Ponded waters are mostly less than 500 acres in size. The two largest bodies of water, both man-made drinking water supplies, are the Quabbin (25,000 acres) and Wachusett (5,000 acres) Reservoirs. The largest river in Massachusetts is the Connecticut River with 72 miles (7,284 acres) transecting the Commonwealth. The 2,027 named streams flow about 10,704 miles and comprise approximately 14,900 acres. The protection, management and enhancement of these inland fisheries resources and their associated habitats involved several ongoing fisheries projects.

Fisheries Survey and Inventory Project

Fiscal Year 2006 Stream Survey project involved participation in the following projects:

1. Statewide Fisheries Survey and Inventory
2. Target Fish Community Development
3. Index of Biotic Integrity Development
4. Coldwater Fishery Resource Designation

Statewide Fisheries Survey and Inventory:

Watersheds were sampled as part of the 5-year basin cycle using a standard sampling protocol. Relative to the 291 sites sampled in FY06 (Appendix 1), the majority of the samples were taken from the Deerfield (59), Chicopee (55), Westfield (24), and Parker (22) River Watersheds. Samples were also taken in 16 other watersheds (Table 1). The sampling resulted in the collection of 28,687 fish of 44 different species. Requests for potential stream survey and inventory sampling locations in the above watersheds were solicited from agencies and stakeholders and were used to prioritize sampling locations.

Table 1. Watersheds and number of samples in each watershed sampled in FY06.

Blackstone	10
Buzzards Bay	2
Cape Cod	2
Chicopee	55
Connecticut	19
Deerfield	59
Farmington	18
French	17
Housatonic	10
Hudson	2
Millers	3
Mt.Hope/Narragansett	1
Nashua	3
Parker	22
Quinebaug	4
Shawsheen	20
South Coastal	1
Taunton	18
Ten Mile	1
Westfield	24
Grand Total	**291**

Target Fish Community Development:

Efforts continued on the development of the Target Fish Community and were based on Bain and Meixler (2000). The Charles River Target Fish Community was completed by the CRWA and Cornell University in consultation with regional fisheries experts (Appendix II, page 73).

Refinements to the Target Fish Community concept were forwarded by federal and state fisheries experts from the Northeast. When combined with Statewide Fisheries Survey and Inventory, the Target Fish Community concept continues to illustrate that our river fish communities are being impacted by water quality and quantity issues and habitat alteration. The Target Fish Community illustrates what a river fish population *should* look like in Southern New England and represents a measurable goal for restoration. A plan was further developed to use inventory procedures, Target Fish Communities, Indexes of Biotic Integrity, and MesoHabitat Mapping to set priorities for habitat

protection and restoration statewide. Data and Target Fish Community Analyses were employed and published in Armstrong et al. (2004).

The Executive Office of Environmental Affairs, as part of their ongoing development of a statewide water policy, planned for the funding of two positions at MDFW to create Target Fish Communities statewide and to develop a statewide Index of Biotic Integrity.

The positions were filled in November of 2005 and two biologists began work to develop Target Fish Summaries and Indices of Biotic Integrity statewide.

Statewide Target Fish Community Progress

Work in FY06 focused on following the TFC methodology and applying it to all basins statewide. The process will involve using GIS models to categorize watersheds by drainage size, stream order, gradient, elevation, geology, and ecoregion. Once completed, this categorization will be used to select a series of quality rivers for comparison purposes. The quality rivers will be assessed in terms of the degree of impact within the watershed, and availability of fisheries data. The TFCs will then be based on the refined list of quality rivers for each watershed, or potentially based on drainage area.

Coldwater Fisheries Resource Designation

A project to identify waters that MDFW considers to be Coldwater Fishery Resources (CFR's), initiated in FY01, was continued and updated based on the fish samples collected in FY05. The current list of waters contains nearly 700 streams statewide. Future efforts are being planned to create GIS coverages that include all coldwater resources.

This list of CFRs is useful as a screening tool to highlight sensitive environmental areas, not as a definitive list of all waters that are CFR's. Each year, as subsequent sampling results are recorded, the list of CFRs will be updated to reflect the most current information.

DEP is currently in the process of completing their triennial review of the MA Water Quality Standards. A project was initiated with DEP to:

1) list all of the waters in the MDFW CFR database as existing uses; and

2) increase the number of streams protected as designated uses in this round of the water quality standards revisions.

In the future, MDFW will participate in a pilot project with DEP to determine the range of natural thermal regimes encountered by the coldwater resources in the state and develop standards that protect this habitat.

Anadromous Fish Investigations

In FY06 the Division hired three six-month seasonal workers to stock Atlantic salmon fry, conduct the Atlantic salmon smolt production assessment in Connecticut River tributaries, and staff the West Springfield fishway on the Westfield River. An additional three three-month seasonal workers were hired to staff the Essex fishway on the Merrimack River. Northeast Utilities, as directed by the conditions of their FERC hydroelectric license, hired seasonal employees for the Holyoke fishway, and Northeast Utilities and USGS employees from the Conte lab counted fish at the Turners Falls fishway. The Division supervised these activities.

1,235,190 unfed Atlantic salmon fry from the Roger Reed State Fish Hatchery and the White River National Fish Hatchery were scatter-planted from shore into tributaries of the CT River in MA in spring 2006.

Because 2006 fish passage operations are ongoing at this time, this report will summarize 2005 fish passage activities. No major malfunctions were experienced at any of the fishways on the Connecticut or Merrimack rivers in Massachusetts in 2005. An American eel upstream passage facility, originally installed at the West Springfield Dam on the Westfield River in the summer of 2001, was remodeled during the summer of 2005.

Connecticut River

The project leader actively participated in the Connecticut River Atlantic Salmon Commission (CRASC), and continued as the chair of the CRASC Technical Committee and the CRASC Shad Studies Group. The project leader also participated in the Connecticut River/Long Island Sound Eco-team (CTR/LIS ET) and as a member of the CTR/LIS ET fish passage sub-committee. The project leader was actively involved in the relicensing of the Holyoke #4 Project on the Holyoke Canal; relicensing of the Woronoco hydroelectric project on the Westfield River in Russell, MA; applications for FERC exemptions at the Westfield Paper dam in Russell, MA; and the Alternatives project on the Mumford River in Northbridge, MA. The FERC relicensing process has also begun for two projects on the Housatonic River in MA (Glendale and Willow Mill). Many telephone, electronic, and written requests for information were also answered by the project leader. The Atlantic salmon egg rearing program (ASERP) continued in 30 schools in the CT River watershed. The project leader was actively involved with the River Restore Program, acting as the Division of Fisheries and Wildlife's representative on the Dam Removal Triage team. This involved traveling around the state looking at, and evaluating dams that may be removed. One dam on Yokum Brook in Becket, MA was removed in February 2003 and another is scheduled to be removed during the summer of 2005.

Holyoke

The City of Holyoke (Holyoke Gas and Electric Co. HG&E) bought the Holyoke Hydroelectric project from Northeast Utilities in 2002. The project leader has been involved in ongoing negotiations with the new owner to settle the outstanding issues and finalize the FERC license for the project. Holyoke Gas and Electric Co., as directed by the conditions of their new FERC hydroelectric license, hired seasonal employees for the Holyoke fishway in spring 2005. The Project Leader

supervised their activities. The Holyoke Fishway was rebuilt between the 2004 and 2005 fish passage seasons. Improvements included:

- New tailrace lift tower, bucket, and hoist
- New spillway lift tower, bucket, and hoist
- Redesigned spillway entrance gallery and crowder
- Wider exit flume
- New salmon traps
- New shad trap and truck facility
- New counting room and second counting window

The new fishlift was operated for upriver fish passage from April 20 through July 18, 2005, except during periods of high water April 21, April 25-May 3, and June 19. Seven species of anadromous fish were identified and counted during the spring/summer fish passage season. The number of Atlantic salmon trapped at the fishlift increased from 34 in 2004 to 131 in 2005. Twelve Atlantic salmon were radio-tagged and released at Holyoke as per agreement with HG&E.

The total number of shad lifted in 2005 (116,523) was 16% of the record high passage of 1992. The 2005 shad passage was 43% of the previous five year mean, and 44% of the previous ten year mean. Examining the cumulative percent of shad passed at Holyoke, 50% of fish passed this project on the 31st day of passage, 20 May. American shad were sampled for biological data on 6 days between 13 May and 8 June. Fork length, weight, sex and scale samples were collected from 184 individuals. This represents 0.2% of the total American shad passed for the year and between 0.3% and 2% of the daily shad passage at the facility. The weighted percentage of the run sampled (the total number of fish passed on days of sampling expressed as a percentage of the entire run) was 23%. The weighted sex ratio of American shad lifted at the Holyoke facility in 2005 was 41% males and 59% females.

Fishlift personnel trapped a total of 1,320 shad for within-basin restoration efforts.

Blueback herring passage in 2005 was 534. This was 0.1% of the maximum passage of 1985, 10% of the previous five-year mean and 2% of the previous ten year mean.

Sea lamprey passage in 2005 (28,134) was 29% of the record passage of in 1998 and was 55% of the previous five-year mean and 60% of the previous ten year mean.

Gizzard shad passage (132) was 1% of the previous five-year mean and 1% of the previous 10 year mean.

Turners Falls

The Spillway, Cabot, and Gatehouse facilities were operated during the anadromous fish passage season in 2005 (May and June). Due to staff limitations, passage was recorded on video tape to be reviewed later by representatives of the Conte Anadromous Fish lab and/or Northeast Utilities. All ladders were monitored from 06:00h until the loss of daylight made video monitoring impossible around 20:00h. All fish ladders remained open for passage 24 hours each day.

Twelve adult Atlantic salmon were allowed to pass the Holyoke fish passage facility. Of these, five were observed passing the fish ladders at Turners Falls.

The number of shad passing the Gatehouse fish ladder in 2005 (1,581) was 3% of the maximum passage of 1992, 69% of the previous 5 year mean and 20% of the previous 10 year mean.

The number of shad passing the Spillway fish ladder in 2005 (1,626) was 14% of the maximum passage of 1992, 54% of the previous 5 year mean and 54% of the previous 10 year mean.

The number of shad passing the Cabot fish ladder in 2005 (5,404) was 6% of the maximum passage of 1992, 46% of the previous 5 year mean and, 37% of the previous 10 year mean.

Examining the cumulative percent of shad passed at Gatehouse, 50% of fish passed this ladder on the 48th day of operation, May 6, 2005.

Examining the cumulative percent of shad passed at Spillway, 50% of fish passed this ladder on the 45th day of operation, May 3, 2005.

Examining the cumulative percent of shad passed at Cabot, 50% of fish passed this ladder on the 49th day of operation, May 7, 2005.

Only 1.4% of the shad lifted at Holyoke (116,523) passed the Gatehouse observation window, well below the restoration goal of 50%.

Westfield River

The West Springfield fishway was operated for upriver passage during spring/summer (April 28 through July 5, 2005). Closures due to high water occurred on June 30. Five species of anadromous fish and six species of resident fish were identified and counted during the spring/summer fish passage season.

An eelway for upstream passage of juvenile American eel was constructed in the lower section of the fishway in August of 2001. That eelway was remodeled in 2005 and operated for upstream elver passage from July 20 through September 25, 2005.

During the spring/summer season, 27 Atlantic salmon were trapped. Of these, 25 were transported by personnel of the United States Fish & Wildlife Service to the Richard Cronin National Salmon Station, Sunderland, MA. The other two salmon were transported from the fishway to the upper Westfield River and released.

A total of 1,237 American shad, 818 sea lamprey, and 329 American eel were passed upstream in spring/summer

2005. The shad passage represents 26% of the record high of 4,720 in 2001.

Atlantic Salmon Fry Stocking, Survival and Habitat Assessment

Between April 3 and April 30, 2005, 1,235,190 unfed Atlantic salmon fry from the Roger Reed State Fish Hatchery and the White River National Fish Hatchery were scatter-planted from shore into the Deerfield River Basin (16 tributaries), the Westfield River (3 main branches and 23 tributaries), the Fall River (mainstem and one tributary), Four Mile Brook, the Manhan River (one branch and one tributary), Mill Brook (Northfield), the Mill River in Williamsburg (two branches and two tributaries), the Millers River, and the Sawmill River.

The Westfield Watershed Association (private group) organized two fry stocking days (140,000 fry total), and the Millers River Chapter of Trout Unlimited also helped to organize and stock 70,000 fry.

Index sites on streams stocked in 2004 were sampled by electrofishing in 2005 to evaluate Atlantic salmon fry growth and survival. Forty-three sites on forty streams were sampled by personnel from the Massachusetts Division of Fisheries and Wildlife.

Population estimates for each age class were obtained by expanding the number of salmon captured by the historical sample efficiency at each site (calculated in past multi-pass depletion samples). Survival was calculated by dividing the population estimate for that year class by the number of units surveyed, multiplied by the stocking density of that year class. An estimate of spring 2006 smolt production was produced by multiplying the population estimate of 2+ salmon by the estimated over-winter survival (.65).

A survey of the total amount of Atlantic salmon habitat in the tributary waters of the Connecticut in Massachusetts is now largely complete. An estimated 49,281 units (one unit equals 100 square meters of river area) of Atlantic salmon habitat have been assessed through this effort.

Merrimack River

In 2005 the project leader actively participated in Merrimack River Policy and Technical Committee meetings as well as several working group meetings.

The two mainstem fishlifts on the Merrimack River in Massachusetts were operated and monitored for anadromous fish passage during the spring/summer of 2005.

Essex Dam

During the spring of 2005 the Essex Fishlift was operated for 81 days between 29 April and 19 July. For the fall season the fishway was operated from 15 September through 1 November. Anadromous fish were identified and enumerated at the counting station. Atlantic salmon were trapped for brood stock purposes and transported to the U.S. Fish and Wildlife Service hatchery in Nashua, New Hampshire.

Anadromous fish passage at the Essex project was disappointing in 2005. The main reason for the low fish numbers was the very wet spring which caused unusually high river flows and prevented CHI from installing the flash boards on the dam until June. With no boards up on the dam, migrating anadromous fish are attracted to the dam and do not find the fishway entrance at the powerhouse.

Only 31 adult Atlantic salmon were counted at the Essex fishlift during spring 2005 (down from 131 in 2004). No salmon were seen in the fall. All were trapped for broodstock purposes. The captured salmon were transported to the U.S. Fish and Wildlife Service National Fish Hatchery at Nashua, New Hampshire to be spawned.

The total number of shad lifted in 2005 (6,456) was only 9% of the record high passage of 2001. Shad passage in 2005 was 11% of the previous five year mean and 15% of the previous ten year mean. Examining the cumulative percent of shad passed at Lawrence, 50% of fish passed this project on the 38 day of operation, 5 June. Shad were trapped and trucked to locations both in-basin and out-of-basin for restoration efforts in MA, NH and ME. A sample of 200 shad were examined for biological information on 20 days between 19 May and 15 July. The number of shad sampled each day varied from 2 to 43 individuals, which represented 0.4% to 100% of daily passage. The weighted % of shad sampled (the number of shad passed on sample days divided by the total number of shad passed) was 62%. From these data the estimated sex ratio of shad passed at Lawrence was 55.7% male, 41.6% female.

From 1996 through 2000 the numbers of river herring passing through the Essex fishway steadily increased from 51 to 23,585. In 2001, however, herring passage declined to only 1,550 fish. This decline continued in 2002 with only 526 herring observed. Herring passage rebounded in 2003 (10,866) and 2004 (14,945), but 2005 passage was only 98. This was 0.03% of the record high passage of 1991. The 2005 herring passage was 1% of the previous five year mean and 1.1% of the previous

Shad.

2006 Fish Production

Table 1. Summary of the number trout produced and stocked from each of the Division's four trout hatcheries in FY06.

(Fall stocking 2005 and Spring stocking 2006)

Species	Size Cat. (inches)	Number of fish				Total No. of Fish
		Bitzer	McLaughlin	Sunderland	Sandwich	
Rainbow Trout	9+	0	54320	0	0	54320
	12+	33150	23802	49417	0	106369
	14+	12273	157722	0	48733	218728
	18+	0	0	0	0	0
	Sub-total	**45423**	**235844**	**49417**	**48733**	**379417**
Brook Trout	6 - 9	15600	0	0	7330	22930
	9+	0	0	46200	0	46200
	12+	0	0	0	13757	13757
	18+	0	0	0	0	0
	Sub-total	**15600**	**0**	**46200**	**21087**	**82887**
Brown Trout	6 - 9	20000	0	0	6500	26500
	9+	0	60349	37267	0	97616
	12+	20600	0	28899	13812	63311
	18+	0	0	0	279	279
	Sub-total	**40600**	**60349**	**66166**	**20591**	**187706**
Tiger Trout	14+	0	0	0	5204	5204
	Sub-total	**0**	**0**	**0**	**5204**	**5204**
	Total	**101623**	**296193**	**161783**	**95615**	**655414**

ten year mean.

Total number of sea lamprey, striped bass, and gizzard shad passing through the Lawrence fishlift were 848; 257; and 0, respectively.

Pawtucket Dam

Operation of the Pawtucket Dam fish elevator began May 10, one week after shad began to move through the Lawrence fishway (approximately 12 miles downstream), and concluded July 7 when upstream movement of shad had declined to a negligible number. The system was operated seven days per week, generally from 7:00 a.m. to 6:00 p.m. Frequency of lifts varied between 0.5 to 2 hours based on the density of fish observed in the hopper bucket. Estimates of fish passage were made by CHI employees who observed the hopper bucket during each lift.

The estimated total number of anadromous fish passed at the Lowell facility is as follows: American shad, 716; river herring 201; sea lamprey 185; striped bass 7; American eel 19; gizzard shad 0. This represents 11% of the shad, 205% of the river herring, 22% of the sea lamprey, and 3% of the striped bass numbers estimated at the Lawrence fishway this season.No sea-run Atlantic salmon were seen at the Lowell fishlift. All sea-run Atlantic salmon that enter the Lawrence fishlift, downstream, are captured and removed for broodstock. However, a large number of domestic broodstock from the sport fishery in the mainstem Merrimack River in New Hampshire were seen in the vicinity of the Lowell fishlift. These can be legally harvested in the Massachusetts portion of the Merrimack and its tributaries upstream of the Essex Dam in Lawrence.

Hatchery/Trout Program

The Division met its annual trout production goal of between 400,000 and 450,000 pounds in

FY06. This production goal is based on the rearing capacity of each hatchery (determined by a combination of the quantity and quality of the water supply and rearing space) and the limits imposed by the National Pollution Discharge Elimination System permit that each hatchery is issued by the Massachusetts Department of Environmental Protection and the U.S. Environmental Protection Agency. The Division's four trout hatcheries produced a total of 410,019 pounds of trout, comprising a total of 655,214 brook, brown, rainbow and tiger trout in FY06, which includes the fall 2005 and spring 2006 stocking seasons (Tables 1 and 2).

A total of 371,456 pounds of trout were stocked dur-

Table 2. Summary of the weight of trout produced and stocked from each of the Division's four trout hatcheries in FY06.

(Fall tocking 2005 and Spring stocking 2006)

Size Cat. Species	(inches)	Weight of fish (lbs) Bitzer	McLaughlin	Sunderland	Sandwich	Total Wgt. of Fish (lbs)
Rainbow Trout	9+	0	15718	0	0	15718
	12+	22768	14378	28072	0	65218
	14+	16040	155520	0	36315	207875
	18+	0	0	0	0	0
	Sub-total	**38808**	**185616**	**28072**	**36315**	**288811**
Brook Trout	6 - 9	3312	0	0	1251	4563
	9+	0	0	11689	0	11689
	12+	0	0	0	6438	6438
	18+	0	0	0	1013	1013
	Sub-total	**3312**	**0**	**11689**	**8702**	**23703**
Brown Trout	6 - 9	5511	0	0	1251	6762
	9+	0	19113	10260	0	29373
	12+	23391	0	23371	7130	53892
	18+	0	0	0	924	924
	Sub-total	**28902**	**19113**	**33631**	**9305**	**90951**
Tiger Trout	14+	0	0	0	6554	6554
	Sub-total	**0**	**0**	**0**	**6554**	**6554**
	Total	**71022**	**204729**	**73392**	**60876**	**410019**

Table 3. Summary of landlocked salmon and Atlantic salmon produced at the Roger Reed Hatchery in FY06.

Species	Size Category (inches)	Number	Weight (lbs)
Landlocked salmon	smolts (8+)	14,030	2,503
	Sub-total	**14,030**	**2,503**
Atlantic salmon	green eggs	2,292,000	—
	unfed and feeding fry (1+)	855,000	300
	adults (15+)	238	3,580
	Sub-total	**3,147,238**	**3,880**

ing the spring of 2006. Trout stocked during the spring included 340,465 rainbow trout that ranged between 9 and 14+ inches long. There were more than 218,000 rainbow trout stocked that averaged 14 inches or longer. There were 76,470 brook trout that ranged between 6 and 18+ inches long, 170,319 brown trout that ranged between 6 and 18+ inches long, and 5,204 tiger trout (all averaging more than 14 inches) stocked as well (Tables 1 and 2). A total of 62,756 trout weighing a total of 38,563 pounds were stocked in the fall. The fall-stocked trout included 38,952 rainbow trout, 6,417 brook trout and 17,387 brown trout ranging between 9 and 12+ inches long.

The Roger Reed Hatchery in Palmer continued its role in both the Atlantic salmon restoration program and the landlocked salmon program for Quabbin Reservoir in FY06. A total of 12,030 landlocked salmon smolts were produced and stocked into Quabbin Reservoir. An additional 2,000 landlocked salmon smolts were delivered to the state of New Jersey in return for 300,000 brown trout eggs. A total of 2.29 million Atlantic salmon eggs

were collected from broodstock held at the station and distributed among cooperating hatcheries in New England. A total of 855,000 Atlantic salmon fry were also produced and stocked into rivers and streams in the Connecticut River drainage basin within Massachusetts. In addition, 238 adult broodstock salmon produced at Roger Reed Hatchery were stocked in selected waters across the Commonwealth. A summary of the numbers of each of the fish species produced by the Roger Reed Hatchery is in Table 3.

A number of much needed infrastructure improvements were made to the hatcheries in FY06. The driveway and parking lots were repaved at the Sandwich and Palmer Hatcheries and the driveway was repaved at the Sunderland Hatchery. Improvements were made to the aeration systems at Montague, Sandwich and Sunderland Hatcheries. Aeration improvements included new aerators, new electric lines and connectors. An alarm was installed on the water supply system and hatchery office building at Sunderland Hatchery. At Palmer Hatchery improvements were made to the water line from the upper reservoir. Improvements were also made to the egg incubation system at Palmer Hatchery. This included new egg incubators and a new water chiller. The power transfer switch for the backup power generator was replaced at Palmer Hatchery. At McLaughlin Hatchery a new backup power generator was installed along with new water flow meters on wells number 1 and 3 and the river water supply system.

There were several hatchery staff changes in 2006. Greg McSharry was hired to fill the Wildlife Technician I vacancy at Sandwich Hatchery. Long-term staff member Leslie Chadwick retired from his Wildlife Technician II position at Sunderland Hatchery and William Musiak was promoted from his position of Wildlife Technician I to fill his position. Eric Jefts resigned his position as Wildlife Technician I at McLaughlin Hatchery.

Warmwater Fisheries Investigations

Esocid Stocking Program:

The Division relies entirely on spring and summer surpluses from other states for esocid stocking. As a result of surpluses from New Jersey and Pennsylvania, 50,417 northern pike ranging in size from two to six inches were stocked into four waterbodies: East Brimfield Reservoir, Brimfield, Buel Lake, Monterey/New Marlboro, Rohunta Lake, Athol/Orange/New Salem and Cheshire Reservoir, Cheshire/Lanesboro. Pennsylvania also made available to Massachusetts 55,511 surplus tiger muskies ranging in size from two to four inches. These tigers were stocked into Quinsigamond Lake, Shrewsbury/Worcester, Pontoosuc Lake, Lanesboro/Pittsfield, South Watuppa Pond, Fall River/Westport and Sabbatia Lake, Taunton.

Freshwater Sportfishing Awards Program

For over 40 years the Freshwater Sportfishing Awards Program has been awarding pins to anglers who catch trophy size fish from the waters of the Commonwealth. Minimum qualifying weights are currently in place for 22 different species of fish. Upon submitting an eligible fish to an authorized weigh station (nearly 100 across the state) or MDFW facility, the angler receives a bronze pin depicting the species of fish with the weight and year of catch stamped on the back. In addition to the bronze pin, the lucky angler who weighs in the largest fish of the year for each of the categories is awarded a plaque and gold pin at the annual sportsmen's show held in February at the DCU Center in Worcester. Affidavits are still being received for 2006, so results from 2005 are presented here. For the first year, starting in 2005, the Division established separate, lowered minimum weights for youth anglers aged 17 and under. 428 pins were awarded in all 22 categories (46 for youth and 474 for adult) for calendar year 2005 (below left).

There was one new state record set in 2005 for bullhead. The fourth annual Angler of the Year Award (presented to the angler who submits the highest number of eligible

Species	Adult	Youth	Gold Pin Adult	Gold Pin Youth
Broodstock salmon	40	1	22 lb. 14 oz.	10 lb. 1 oz
Brook trout	9	1	2 lb. 8 oz.	3 lb. 8 oz.
Brown trout	9	0	9 lb. 12 oz.	NA
Bullhead	32	0	4 lb. 10 oz.	NA
Carp	17	2	34 lb. 1 oz.	26 lb. 0 oz.
Chain pickerel	28	5	6 lb. 6 oz.	5 lb. 9 oz.
Channel catfish	21	3	16 lb. 0 oz.	8 lb. 10 oz.
Crappie	16	4	3 lb. 8 oz.	2 lb. 4 oz.
Lake trout	25	3	21 lb. 4 oz.	13 lb. 9 oz.
Landlocked salmon	1	0	5 lb. 14 oz.	NA
Largemouth bass	21	0	8 lb. 6 oz.	NA
Northern pike	16	2	23 lb. 0 oz.	21 lb. 2 oz.
Rainbow trout	8	0	6 lb. 11 oz.	NA
Shad	21	7	9 lb. 7 oz.	6 lb. 1 oz.
Smallmouth bass	22	3	5 lb. 13 oz.	5 lb. 3 oz.
Sunfish	9	2	1 lb. 2 oz.	1 lb. 2 oz.
Tiger muskie	6	2	21 lb. 15 oz.	21 lb. 8 oz.
Tiger trout	4	0	3 lb. 7 oz.	NA
Walleye	7	0	9 lb. 13 oz.	NA
White catfish	16	0	6 lb. 11 oz.	NA
White perch	80	9	2 lb. 15 oz.	2 lb. 0 oz.
Yellow perch	20	2	2 lb. 7 oz.	1 lb. 12 oz.

Photo by Peter Mirick

Shad fishing in Lawrence on the Merrimack River.

species) was presented to Todd Matera of Palmer, who weighed in 8 different species.

Bass Tournament Creel Analysis

For the past ten years, the Fisheries Section has been monitoring the results of black bass (largemouth and smallmouth bass) tournaments to help establish a long term database of variables such as catch rates and average fish size for specific waters. Any organization which requests the use of a Public Access Board (PAB) facility to hold a fishing event must receive a Special Use Permit. As part of the permit, the PAB includes a creel sheet to be completed by the fishing club at the close of the event. Additionally, individual bass clubs as well as the Massachusetts Chapter of B.A.S.S. (Bass Anglers Sportsmen's Society) have been given creel sheets in an attempt to generate information on tournaments held on non PAB ramps. The creel sheets are also available to download on the Division's website. The completed creel sheets are mailed to the Warm/Coolwater Project Leader at the Field Headquarters. The creel seeks the following information: club name, date of event, location of event, start and end time, number of anglers, number of anglers weighing bass, number of anglers with limits of bass, total number of bass weighed in by species, total bass over 5 pounds, number of bass returned alive by species, total weight, winning weight and the weight of the biggest bass of the event. There is also space for the club to include comments. This information is entered into a database to allow the Division to detect long term trends in the bass populations in some of the Commonwealth's most heavily fished waters. Creel sheets are still coming in for the 2005 tournament season, so results from the 2004 season are presented here.

In 2004, a total of 212 creel sheets were sent in to the Field Headquarters (same number as 2003). These 212 tournaments represented 61 different bass clubs fishing on 44 different waters. A total of 8,774 largemouth bass and 1,653 smallmouth bass were weighed in for a catch rate of approximately 1 bass per 3 ¼ angler hours. The average weight of a bass weighed in was 1 lb. 14 oz. These indicies have not changed significantly since tracking began in 1996. Over time, these data will aid in detecting possible changes to the bass fishery.

Fish Kill Investigations

Pursuant to the 1999 Fish Kill Memorandum of Understanding between the Department of Environmental Protection (DEP), the Division of Fisheries and Wildlife (DFW), the Division of Environmental Law Enforcement (DELE) and the Department of Food and Agriculture

(DFA), DFW, as the coordinating agency, received 24 reports of dead fish, seven less than in the previous year. The Division receives fish kill calls from a variety of sources. The breakdown of the 24 reported kills was as follows: 12 private citizen, 2 DFW & DELE, 5 DEP, 1 DFA, 2 town official, 1 state park, and 1 private environmental consultant. Of these 24 reports, 6 required field investigations by DFW or DEP personnel to determine the cause of the kill. The final disposition of the 24 calls was 18 natural kills, 2 agricultural operations, 1 bait fish, 1 low flow conditions, and 2 pollution related.

Environmental Review

In 2006, DFW reviewed and provided comments on all projects affecting fisheries resources published in the *Environmental Monitor*. DFW also provided technical information to a wide variety of consultants, town and state officials on local projects. There were 121 requests to review project proposals potentially affecting 116 different named waters (81 rivers and streams and 35 ponds) statewide. Seventy nine percent of the requests were received from environmental consulting contractors to fulfill DEP and MEPA filing requirements. The remainder of the requests were from state agencies such as DCR, DEP and MassHighway (7%); federal agencies such as the Army Corp of Engineers and the USEPA (3%); local entities such as conservation commissions, departments of public works, water districts and lake associations (8%); and private entities such as power companies and Sportsmen's Clubs (3%). Fisheries resources were partitioned as follows: warm water (33%), coldwater (16%), stocked (21%), anadromous (7%), rare, threatened or endangered (4%), marine (2%), unknown (14%) and no fisheries resources (3%). The majority of the projects were bridge replacements/rehabilitations over streams (26%) and road reconstruction including culvert replacements (19%). The remaining reviews involved new construction (15%), lake management issues such as drawdowns, dam repairs, new docks, fish passage and stream bank stabilization (28%), proposed new well sites (6%), and projects such as gas pipeline extensions and repairs (3%) and NPDES reviews (3%).

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WILDLIFE

Thomas K. O'Shea
Assistant Director for Wildlife

The Wildlife Section oversees research and management of all avian and mammalian species within the Commonwealth of Massachusetts which are primarily utilized in any way for meat, fur or sporting purposes. It is responsible for the Division's Forestry Program and for the Upland Habitat Program on over 100,000 acres of state wildlife management areas. The overall program goal is to promote biodiversity, to conserve the Commonwealth's game species, and more specifically, to maintain wildlife populations at levels that are in balance within the biological carrying capacity of their habitat and cultural carrying capacity of the public.

While the Wildlife Section is devoted primarily to research and management of wildlife populations of species that are hunted or trapped, as well as active habitat management, it is also responsible for the Division's pheasant stocking program, the testing and registration of PAC (problem animal control) agents and falconers, and the licensing and inspection of commercial deer farms and certain other propagators' facilities.

The Wildlife Section has a staff of wildlife biologists and foresters who conduct research and management projects throughout the state with assistance by District personnel and in cooperation with the U.S. Fish & Wildlife Service and the Massachusetts Cooperative Fish & Wildlife Research Unit (USGS). Biologists and foresters within the Wildlife Section engage in wildlife management programs under the following general classifications:

- Monitoring and research of wildlife populations and habitat
- Population analysis
- Harvest management
- Community-based human-wildlife conflict management
- Restoration of wildlife
- Ecological research
- Public use and methodology surveys
- Sustainable forest management
- Early-successional habitat management
- Habitat protection

Public education is a major component of wildlife management in Massachusetts. Staff biologists provide information to individual constituents and municipalities through direct response, text for publications and community outreach programs.

Migratory Bird Census

Mourning Dove Census: The number of calling doves on 3 long-term survey routes decreased 27% from 2005 to 2006. Counts on eight comparable routes decreased 16% from 2005 to 2006.

Woodcock Census: Results of the fall 2005 hunting season as measured by the woodcock wing-collection survey indicated that the average bag per hunt and per season increased 18.8% and 61.4% respectively when compared to the previous season. Production of young, which is measured in a ratio of immature birds per adult female, decreased 18.8% when compared to the long-term average.

Eleven randomized spring woodcock singing ground surveys were conducted in 2006. The total number of singing woodcock heard on comparable routes during the spring census in Massachusetts increased 38% (16 to 22 woodcock heard) from 2005 counts.

Ruffed Grouse Census: The average number of drums per stop (ANDS) for 29 random routes in 2006 was 0.16 ± 0.04. For comparison, 26 random routes run in 2005, ANDS was 0.10 ± 0.03. These results show a 60% increase in ANDS from 2005-2006.

The Western District has shown a slight decline in ANDS from 2002-2005, and a slight increase in 2006 for a 5-year average of 0.18, while the Valley District seems to remain constant, averaging 0.15. The Central District shows greater fluctuations than either the Western or Valley Districts and it has a 5-year average of 0.28. The Northeast and Southeast districts have been consistent zeros.

Waterfowl Surveys and Management: Division personnel continued to conduct nest box checks on 52 sites used to monitor wood duck populations statewide. Summer checks revealed 401 wood duck nest starts in 627 available boxes, with 283 successful hatches (76%). In addition, there were 64 hooded merganser hatches from 109 starts. The number of successful hatches for both species was less than last year, primarily due to flooded nests from above average spring precipitation.

Massachusetts participates in the Atlantic Flyway Resident Goose Banding Program. This program is designed to band 1% to 2% of a state's breeding Canada goose population. Geese are captured by round ups during the summer molt. This year an effort was made to estimate the total resident goose population by marking one or

more adult birds in each flock with a coded, plastic neck collar to be used as marker in a mark-resight study. A total of 2,032 Canada geese were banded at 188 sites in 120 towns in Massachusetts. The total included 811 goslings and 1,221 adults. Four hundred twenty five geese were also marked with neck collar bands for the population estimate study. An additional 148 geese were banded in reward series bands of various denominations as part of a national band reporting rate study. Crews also captured an additional 516 previously banded geese.

During the period July 25 to September 5, DFW personnel used binoculars and spotting scopes to count Canada geese throughout Massachusetts prior to the beginning of migration of northern nesting geese. Field teams examined 15,810 geese on 502 sites out of approximately 2000 sites checked. We were successful in re-observing 34.3% of the neck collars and developed a population estimate of 39,481 across the state prior to opening of the September hunting season, not including the offshore islands. This compares to a previous population estimate of 38,000 geese in 1997, a period when the regular goose hunting season had been closed for 2 years, and 25,000 in 1991, the first year the DFW provided a population estimate.

Water conditions were low after a dry summer and hampered boating on several sites, notably the Chicopee River, West Hill Dam, Milford Pond, and Bunker Meadows on the Ipswich River Audubon Sanctuary. Several factors, however, converged to limit airboating success. A number of traditional airboating sites were not sampled because of low waterfowl numbers. Only 14 trips were made because pre-trip scouting eliminated several sites where few or no waterfowl were observed. In addition, a major night lighting site has always been the Concord impoundments of the Great Meadows National Wildlife Refuge. Historically, Great Meadows accounted for 25% to 65% of the total airboat bandings in the state, but in 2005 the refuge began a 3 year paired impoundment shorebird study and airboating was not allowed

In all, DFW staff banded 647 ducks with catches ranging from 0 to 115. Among the birds banded were 402 wood ducks, 217 mallards, and 6 American black ducks. Staff also participated in a federal band reporting rate study which involved placing reward bands on a sample of black ducks and adult mallards.

The summer mute swan breeding survey, conducted every 3 years, revealed l,046 swans in the state with 787 adults and 259 cygnets in 100 broods. The 2005 swan count was 10.5% higher than the last count in 2002. While there was a 10% decrease in swan numbers in the coastal zone, there was a 44% increase on inland sites as swan populations have spread westward through the state.

During September 7-25, Massachusetts had a resident Canada goose season with a five bird daily bag limit. The Migratory Bird Hunter Harvest Information Program (H.I.P) of the U.S. Fish and Wildlife Service estimated a September season harvest of 4,100 geese. This compares to a harvest estimate of 3,800 last year.

Duck hunting seasons in the Atlantic Flyway continued with the liberal option of 60-day seasons and a six bird bag limit. The Canada goose season was 60 days with a two bird daily bag limit in the Central and Coastal waterfowl hunting zones, and 45 days with a two bird bag limit beginning the fourth Saturday in October in the Berkshire zone.

The annual Midwinter Waterfowl Survey was restored to full coverage this year after last year's coverage had been reduced because of a funding shortfall. American black duck numbers were low, with only 15,553 ducks counted, 22% below the 10 year average. Mallard counts (3,871) were 8% higher than the 10 year average. Canada goose numbers (10,793) were 6% below the 10 year average.

Between January 15 and February 15, 2005, Massachusetts held a late, resident Canada goose season in the Central waterfowl zone while the season in that portion of the Coastal zone north of Cape Cod ran January 24 to February 15. The USFWS estimated a harvest of 4,000 geese compared to 3,900 birds last year.

During April and May DFW biologists participated in the Northeastern states waterfowl breeding survey which is based on sampling randomly selected one kilometer square plots. Massachusetts checked 93 of the 1,488 plots used in the survey. Eleven states participated in the 2005 breeding pair survey for waterfowl. The population estimate for mallards was 358,214 pairs $\pm$ 50,426. The estimate for black ducks was 21,471 pairs $\pm$ 6,254; wood ducks, 195,916 pairs $\pm$ 35,380, and Canada geese, 410,544 pairs $\pm$ 60,804. Data from this survey is used to set hunting season regulations tailored to the Atlantic Flyway.

Wild Turkey

Wild Turkey Range and Harvest Evaluation: The 16th modern-day fall either-sex turkey season was held from Oct. 31 to Nov. 5, 2005. The open zone included wildlife management zones (WMZs) 01 through 09 and 13. There were 14,007 eligible permittees. A total of 163 turkeys was taken, including 55 (33.7%) in Franklin County, 34 (20.8%) in Worcester County, 29 (18.0%) in Hampshire County, 27 (16.5%) in Berkshire County, 11 (6.7%) in Hampden County, 6 (3.7%) in Middlesex County, 1 in Norfolk County (0.6%) and none in Dukes County. There were 36 adult males (22.1%), 42 immature males (25.8%), and 85 females (52.1%) harvested.

The 27TH Massachusetts spring gobbler hunt was held in April-May 2006. The 4-week open zone included WMZs 01 through 10 and 13. The 2-week zone included Zones 11 and 12. A record total of 14,295 permit applications were received. A harvest of 2266 turkeys was attained (the 15th straight year over 1000 and the 8th over 2000). There were 343 persons (2.4%) who took their second bird in the bag, as compared to 367 persons (2.7%) in

Black bear sow in corn.

2005. The overall estimated success rate for taking 1 turkey was 13.4% as compared to 14.0% in 2005. The Worcester County harvest was 628 (27.7%), followed by Berkshire (434, 19.2%), Franklin (384, 16.9%), Hampshire (214, 9.5%), Hampden (174, 7.7%), Plymouth (130, 5.8%), Middlesex (107, 4.7%), Essex (84, 3.7%), Bristol (62, 2.7%), Norfolk (41, 1.8%), Barnstable (7, 0.3%), and Dukes (1, <0.1%). Adult males comprised 1434 (63%) of the take, as compared to 1145 (50%) in 2005.

Black Bear

Black Bear Distribution and Harvest Investigations: A record total of 3593 bear hunting permits was issued for the 2005 hunting season. A total of 113 bears were taken during the 23-day split season, including 98 during the 23-day September segment and 15 (a record) during the 6-day November segment. Sixty-two females and 51 males were taken in Berkshire (n=52), Franklin (n=34), Hampden (n=14), and Hampshire (n=13) counties. There were 19 non-hunting mortalities (19 in 2004-05) including 13 road kills, three depredation kills, two bears found dead, and one illegal kill. A total of 108 problem bear complaints was received (99 in 2004-05) primarily including 37 depredations on bird feeders, 26 trash and campground complaints, and 16 residential complaints. Additional untallied complaints were received by the Office of Law Enforcement and local officials. In 2006, the November segment of the season will be increased from 6 to 18 days.

The black bear field study conducted by the University of Massachusetts (in cooperation with DFW) was shifted to DFW in 1999. Fourteen radio-collared female bears and one male bear were active in July 2005. One sow lost her collar in July, one was road-killed in August, and the male was killed during the September hunting season. During winter 2005, six of the 11 remaining bears were tracked to their winter dens. One other was recaptured in a barrel trap in June. Three of the six sows handled had a total of six cubs (4♂, 2♀), 1 had both a yearling (1♂) and 2 (2♂) cubs, and 1 was prepubescent. Three bears with an estimated 7 yearlings bolted from the den and neither the sow nor the yearlings were captured. One three-year-old sow could not be located. Two adult sows with three cubs each (1♂, 2♀, 3U) were captured by chance and radio-collared. Three males (2 yearlings, 1, 2 or 3-yr-old) were captured in barrel traps in May-June and ear-tagged. Four ear-tagged bears (2♂ 2♀) were killed in the 2005 hunting season. One of the males was last handled in 2003 and one in 2005. One of the females was ear-tagged and collared in the den in 2003 and lost its collar the same year. The second sow (from the former Savoy-Hawley study area) had its collar removed in 1992 and was killed in September 2005 (aged 21 yrs). Thirteen radio-collared females were being monitored as of July 1, 2006.

Furbearer Program

The Furbearer Program is responsible for the management and research of 14 species of wildlife in the Commonwealth. This group includes beaver, muskrat, bobcat, eastern coyote, red and gray fox, river otter, fisher, striped skunk, mink, long-tailed and short-tailed weasel, raccoon and opossum.

The furbearer management program addresses many challenges presented to wildlife managers in the state, and uses various options including habitat manipulation, public education and regulated hunting and trapping as tools in the management of our renewable furbearer resources. A combination of techniques is used to:

1. Control problem animals;
2. Regulate wildlife populations;
3. Reduce habitat degradation;
4. Reduce crop and property damage;
5. Aid in the recovery of endangered species;
6. Allow a sustainable harvest of renewable furbearer resources.

These activities provide both recreational and economic opportunity for citizens and households in the state. During the 2005-2006 season, 2,489 furbearers were taken. This breaks out into 806 beaver, 45 bobcat, 188 coyote, 342 fisher, 119 river otter, 33 red fox, 38 gray fox, 178 raccoon, 30 mink, 7 weasel, 119 skunk, 37 opossum, and 543 muskrat.

Massachusetts has complex laws and regulations that govern trapping.

Regulations include:

1. Mandatory licensing of trappers;
2. Mandatory trapper training;
3. Restrictions on the size of traps;
4. Restrictions on types of traps;
5. Restricted seasons for trapping;
6. Restricted areas for trapping;
7. Mandatory regular checking of traps;
8. Mandatory tagging of traps to identify the owner.

Management and Research efforts

Pelt sealing: Pelt sealing is used to gain harvest information and determine distribution of beaver, otter, red fox, gray fox, bobcat, coyote, mink, and fisher statewide. During the 2005-2006 harvest season, the Division "sealed" 1,605 pelts.

Wetland/beaver management: Ten years ago the voters of Massachusetts, acting through a ballot referendum, modified existing laws that regulated lawful traps for certain species of wildlife and banned the use of certain traps traditionally used for the capture of beavers.

Between 1996 and 2000, the beaver population tripled and complaints about flooding increased. Typical complaints included: flooded septic systems, wells, roads, driveways and railroad tracks. In July 2000 the Massachusetts Legislature passed, and the Governor signed, a new law that modified the restrictions on beaver and muskrat traps to provide relief for people suffering from flooding impacts caused by beaver or muskrat. An emergency permitting system was created at the town level with certain non-emergency permits for specific traps available from the Division of Fisheries and Wildlife.

At this time towns are not required to report beaver-related activities that occur under the emergency permitting process, therefore the Division obtains this information from annual reports submitted by Problem Animal Control (PAC) agents and from voluntary surveys of licensed trappers. Based on PAC annual reports and trapper surveys, PAC agents and licensed trappers removed 915 beaver between April 16, 2005 and April 15, 2006.

The Division has developed a number of brochures that explain options to landowners discussing the positive and negative aspect of beaver activities, associated wetland values and overall management of beaver. In June 2006 the Division produced two new brochures and updated the beaver web pages to make it easier for people seeking information and assistance. The first brochure, entitled "Beavers and the Law: A Citizens Guide to Addressing Beaver Conflicts," explains, step by step, how people can seek relief if they have a problem with beavers or muskrats. The second publication, "Living with Beaver," provides basic natural history information and tips on avoiding and resolving conflicts with beaver.

Public education, regulated harvest, and the installation of flow devices are the key components of beaver management in Massachusetts.

Wildlife Depredation and Damage: Division personnel responded to complaints about furbearer species causing the loss of domestic livestock and pets. Specific furbearer species causing concern are eastern coyotes, red foxes, gray foxes, fishers, raccoons, and skunks. Site visits were conducted and technical advice given in an attempt to eliminate or alleviate damage situations. A new brochure about the striped skunk was created as an addition to the Division's series of "Living with Wildlife" brochures. Currently there are informational flyers for 7 of the 14 furbearer species. These flyers present the natural history of the species and methods the public can use to prevent conflicts. Complaints regarding eastern coyotes have come from more than 340 separate towns in the Commonwealth since 1990. Coyotes currently occur in all communities in Massachusetts except Martha's Vineyard and Nantucket. Most of the complaints received report coyotes killing livestock and poultry, harassing pets, and denning in or around human structures.

As of July 2006, rabies has been confirmed in 12 of 14 counties in Massachusetts. The disease is now found throughout the entire Commonwealth except for Martha's Vineyard and Nantucket Island. Rabies broke through a rabies vaccine barrier and was detected on Cape Cod for the first time in March 2004. From September 1992 - December 2005, 4,764 animals including, 2,593 raccoons, 1,449 skunks, 343 bats, 124 foxes, 124 domestic cats, 82 woodchucks, 15 cattle, eight domestic dogs, eight coyotes, three otter, two fisher, two bobcat, one deer, and 10 others have tested positive. The Division developed informational brochures and a presentation on zoonotic diseases that were incorporated into trapper education training. The Division also attends regular meetings of the statewide Rabies Advisory Committee in order to advise on wildlife-related rabies concerns and questions.

White-tailed Deer Program

Harvest and Population

The statewide 2005 harvest of 11,943 deer is the third highest harvest reported in Massachusetts with record archery (3,162) and muzzleloader (2,325) harvests (Table 1). The 2005 white-tailed deer harvest by sex/age and the number of antlerless deer permits allocated and issued by wildlife management zone for Massachusetts are in Table 2. Overall, there was a 1% decrease in harvest from the 2004 hunting season with increases of 5% in archery season and 8% in the muzzleloader season. Shotgun season, however, had a 3% decrease in harvest. The 2005 deer harvest by season and wildlife management zone is in Table 3.

In response to a request from the town of Nantucket, the Fisheries and Wildlife Board voted to

Table 1. The 2005 White-tailed deer harvest by season and sex/age class.

Season	Adult Male	Female	Male Fawn	Unknown sex	Total	% Harvest
Paraplegic	1	6	0	0	7	0 %
Archery	1861	1067	223	11	3162	26%
Shotgun	3017	2731	688	13	6449	54%
Muzzleloader	749	1319	253	4	2325	20%
Subtotal	5628	5123	1164	28	11943	
Quabbin	41	62	14	0	117	
Total	**5669**	**5185**	**1178**	**28**	**12,060**	

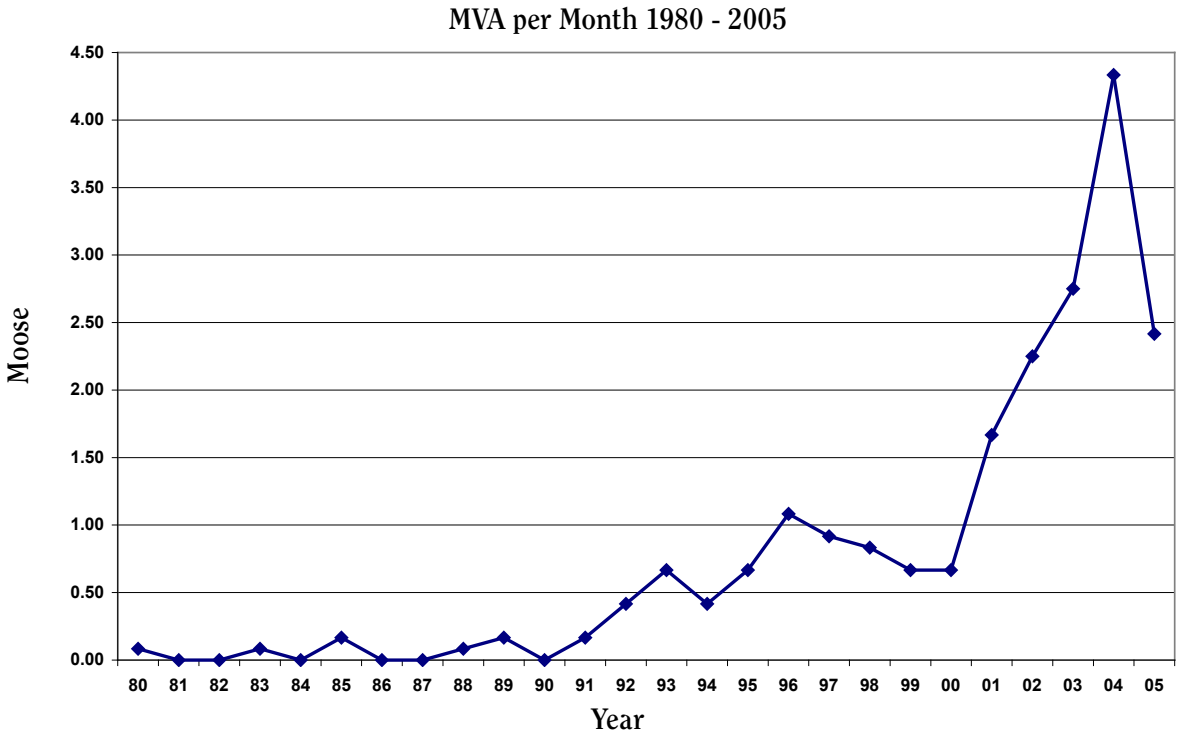
Table 2. White-tailed deer harvest by deer sex/age and the number of antlerless deer permits allocated and issued by wildlife management zone for Massachusetts, 2005.

WMZ	Adult Male	Female	Male Fawn	Unknown sex	Total Harvest	ADP Allocation	ADP Issued
1	142	115	23	0	282	950	900
2	258	25	3	0	287	150	142
3	404	455	105	0	968	3650	3610
4N	276	89	14	0	379	400	393
4S	180	50	9	1	241	400	386
5	355	186	35	2	578	1700	1632
6	102	66	13	0	181	600	569
7	425	344	77	0	848	2900	2779
8	597	548	108	2	1255	4500	4440
9	580	562	139	2	1285	4950	4782
10	849	1001	228	5	2082	8650	7906
11	963	1144	283	4	2395	9900	9434
12	111	85	14	0	210	950	891
13	205	281	68	2	554	2600	1037
14	155	161	45	0	361	2600	798
Unknown	26	11	0	0	37		
Statewide	**5628**	**5123**	**1164**	**18**	**11,943**	**44,850**	**39,699**

Table 3. The 2005 deer harvest by deer management zone and season.

WMZ	Paraplegic	Archery	Shotgun	Muzzleloader	Total
1	1	50	183	48	282
2	0	63	179	45	287
3	3	160	607	198	968
4N	0	86	215	78	379
4S	0	45	132	64	241
5	0	107	328	143	578
6	0	23	120	38	181
7	2	179	507	160	848
8	0	250	732	273	1255
9	1	323	696	265	1285
10	0	800	842	440	2082
11	0	814	1169	412	2395
12	0	40	134	36	210
13	0	126	346	82	554
14	0	91	237	33	361
Unknown	0	5	22	10	37
Statewide	7	3162	6449	2325	11,943

Figure 1. Moose vehicle accidents reported in Massachusetts per month from 1980 to December 2005.



rescind the one week February deer hunting season on Nantucket. This special hunt was part of a long-term management strategy to both reduce high deer density (40-60 deer/mile^2) and reduce exposure to deer ticks, thereby reducing the incidence of tick borne diseases.

This was the fourth year of a change in the antlerless deer permit system that requires a hunter to have an antlerless deer permit to harvest an antlerless deer in any deer season. The change has increased hunter opportunity statewide while regulating deer harvest across all WMZs. Under

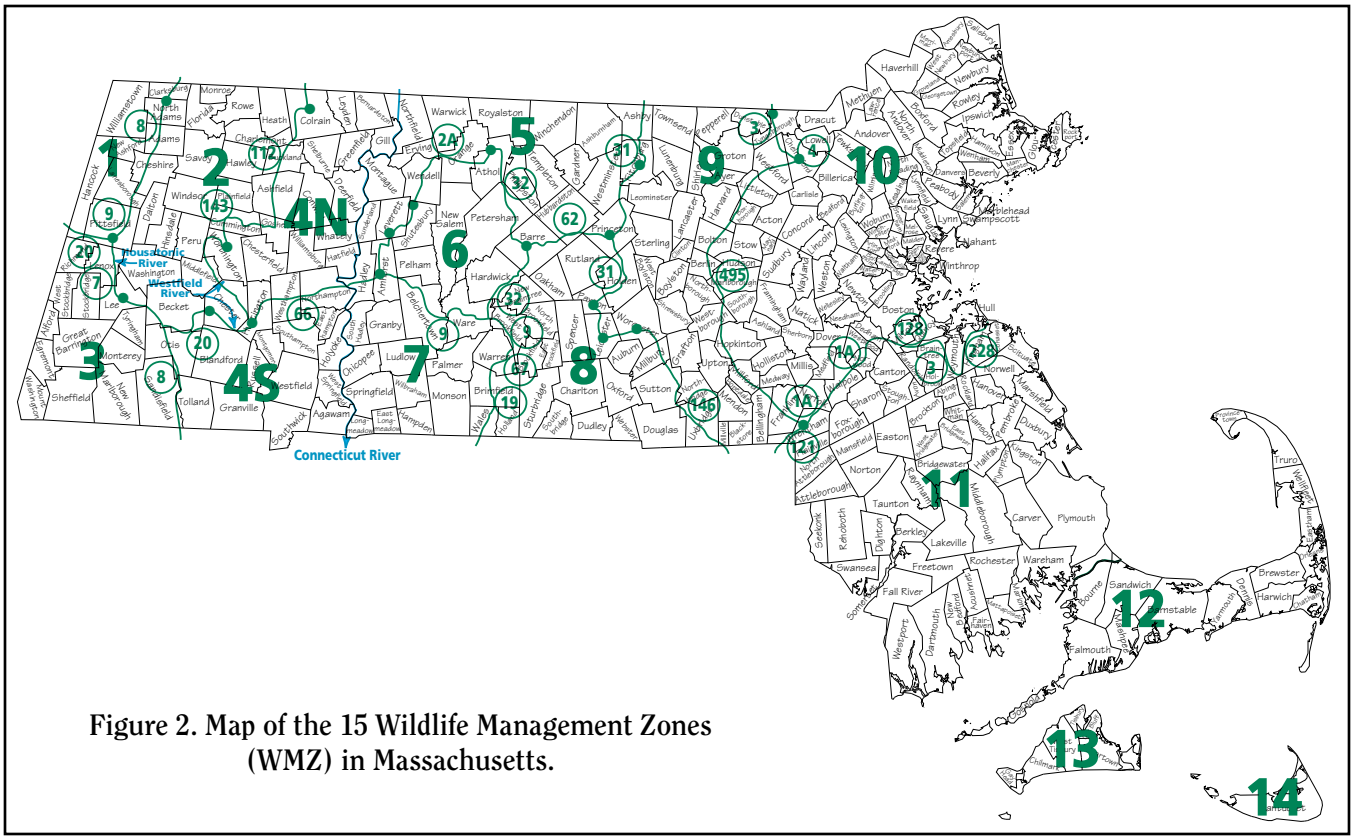


Figure 2. Map of the 15 Wildlife Management Zones (WMZ) in Massachusetts.

this system we have been able to increase deer densities in Wildlife Management Zones 2, 4S and 4N; maintain deer densities in WMZs 1, 5, 6 and 12; and decrease deer densities in WMZs 3, 7, 8, 9, 10, 11, 13 and 14. Currently, the deer population statewide is estimated to be between 85,000 and 95,000. Densities range from 10-12 deer mile^2 in western Massachusetts to over 40- 60 deer mile^2 on the islands of Martha's Vineyard and Nantucket in eastern Massachusetts.

Antlerless deer permit (ADP) allocation for 2005 was 44,850 permits, a <1% decrease from 2004, with 39,699 permits (89%) actually issued. Nearly 41% of the issued permits were sold over the counter as additional antlerless deer permits in those zones where allocation exceeded demand. These additional permits effectively caused a bag limit increase in those WMZs.

Research

Research continues in an effort to determine cause specific mortality for deer in three study areas, by monitoring existing collared deer. Currently, there are 30 radio-collared deer in Massachusetts, with 15 in the west, 5 in the north-central, and 10 in the east. Non-harvest mortality continues to exceed harvest mortality in all three study areas and survival rates remain high.

Chronic Wasting Disease

In accordance with the USDA-APHIS guidelines for Chronic Wasting Disease (CWD) Surveillance, we continued with our surveillance program. Deer heads were collected from each deer management zone to obtain the required samples to generate a statistically valid stratified sample for Massachusetts. During the 2005 deer seasons, Massachusetts collected 577 samples. CWD was not detected. We will continue surveillance efforts in the 2006 deer seasons with funding provided by the USDA-APHIS (especially in those WMZs that border New York State and that have captive deer facilities).

Moose

The Division of Fisheries and Wildlife collects data concerning moose sightings from the public, moose found dead, and moose vehicle accidents (MVA). These indices are used to determine population trends and to estimate the moose population in Massachusetts. There have been 1,128 reports submitted to the DFW concerning moose since 1924. In 2005 the DFW received 85 reports concerning moose: 29 MVAs, 21 sightings, 11 moose euthanized, 6 dead moose, 3 public safety kills, 6 LART responses, and 9 relocations of problem moose. The trend in moose sightings reported to DFW continues to decline and we had a decline in the number of reported MVA's from 2004. Biologists feel this decrease is due to a lack of reporting, rather than a decline in the moose population.

Table 4. The moose mortality reported in Massachusetts from 1980 to 2005.

Total MVA is the sum of roadkill and collisions, while total mortality is the sum of total MVA and other mortality.

Year	Roadkill	Collisions	Total MVA	Other Mortality	Total Mortality
1980	1	0	1	0	1
1981	0	0	0	0	0
1982	0	0	0	0	0
1983	1	0	1	0	1
1984	0	0	0	0	0
1985	2	0	2	0	2
1986	0	0	0	3	3
1987	0	0	0	0	0
1988	1	0	1	1	2
1989	2	0	2	2	4
1990	0	0	0	0	0
1991	2	0	2	4	6
1992	5	0	5	5	10
1993	8	0	8	4	12
1994	5	0	5	3	8
1995	8	0	8	4	12
1996	12	1	13	5	18
1997	11	0	11	4	15
1998	6	4	10	8	18
1999	8	0	8	9	17
2000	8	0	8	7	15
2001	18	2	20	9	29
2002	22	5	27	12	39
2003	28	5	33	7	40
2004	43	9	52	15	67
2005	24	5	29	20	49
Total	**215**	**31**	**246**	**122**	**368**

Table 5. Moose sighting rates per 100 hours of deer hunting, and moose vehicle accidents by Wildlife Management Zone (WMZ) in 2005.

WMZ	Sighting Rate (100 hrs/hunting)	Moose Vehicle Accidents
1	0.04	0
2	0.50	1
3	0.11	0
4N	0.32	6
4S	0.45	3
5	1.07	9
6	1.47	1
7	0.18	0
8	0.37	2
9	0.15	2
10	0.02	0
11	0.03	0
Statewide	**0.22**	**29**

Moose.

Figure 1 represents the number of moose vehicle accidents per month from January 1980 through 2005. Moose vehicle accidents are all moose that were stuck and killed on Massachusetts highways, plus all moose that were struck by vehicles but walked away from the accident. There have been 246 MVA in Massachusetts from 1980 to 2005 (Table 4). The MVA rate for 2005 was 2.42 moose per month. That is a 56% decrease from the 2004 record year (Figure 1). However, the 2005 MVA rate is still above the 5 year MVA average of 2.33 per month and the 10 year average of 1.58 per month. This is a minimum number, since at least some MVA's are not being reported to DFW or Environmental Police, and DFW staff continue to learn about MVAs indirectly through newspaper reports.

The current moose population in Massachusetts is estimated to be between 700 and 800 animals. This is calculated through a population model that includes sighting rates from the deer hunter survey and available moose habitats in the 12 Wildlife Management Zones. Cape Cod and the islands are not included in this estimate. Currently, the sighting rate across the Commonwealth is 0.22 moose/100 hours of deer hunting, which is a decrease from the 0.27 moose/100 hours of deer hunting in 2004 (Table 5).

Currently, we are monitoring eight collared moose (three male and five female). There are five animals (three females and two males) in Massachusetts, one female in northern Connecticut, a male in southern Vermont and a female in southwest New Hampshire. The three moose being tracked in the neighboring states all originated in Massachusetts and dispersed to their current locations.

In early spring of 2006 the DFW began a research project with the USGS Cooperative Fish and Wildlife Research Unit using GPS collars to obtain fine scale evaluation of movement and habitat use. At this time two bull moose have been outfitted with GPS units made available by the University of Massachusetts and the Safari Club of New England. The DFW has nine more collars to deploy.

Forestry Program

The Forestry Program is one component of the DFW's Biodiversity Initiative, which seeks to maintain and restore the native diversity of flora and fauna through active land management. The Forestry Program focuses on creating a distribution of successional stages from young forest habitat to biologically mature (late-seral) forest habitat in a landscape context that will conserve the biological diversity of species and communities within the forest ecosystem.

The forestry program's objectives are:

1) Build a forest inventory data base, prepare GIS-based landcover maps, and establish property boundary lines in the field for each wildlife management area (W.M.A.).
2) Use inventory data to design and carry out both commercial forest harvesting operations and non-commercial management activities to meet landscape composition goals for successional forest habitats that maintain biological diversity using ecological regions (ecoregions) as the fundamental planning units for management.
3) Conduct pre- and post-treatment biological monitoring to determine the response of wildlife populations to forest cutting operations.

DFW Forestry Program landscape composition goals are:

15-20% young forest habitat (≤30 years old)

10-15% biologically mature forest habitat (≥150 years old)

65-75% mid-successional forest habitat (30-150 years old.)

The Forestry Program Leader and two Management Foresters conduct commercial forest harvesting operations through an open, competitive bidding process in compliance with Division forest management guidelines to create young forest habitat. The guideliHnes provide a sequential checklist of steps for each sale to insure that landscape conditions are assessed, and that management activities reflect landscape conditions. Prior to any cutting operation, Division foresters consult with District staff to address local access and aesthetic issues, and with personnel from the Division's Natural Heritage & Endangered Species Program to conserve state-listed species and priority natural communities on W.M.A.s. All forest management activities receive permits from the Department of Conservation and Recreation under the Massachusetts Forest Cutting Practices Act.

Forest Certification

The DFW lands continue to operate as certified, sustainably managed forestlands under the international Forest Stewardship Council (FSC) criteria for sustainable forestry (see http://www.mass.gov/envir/forest/). This independent, third-party certification assures the general public that all forest cutting practices employed

by the DFW are sustainable on an ecological, economic, and social basis.

One major requirement of certification is that DFW complete management planning for all of its properties over the next few years. In FY06, in cooperation with forest managers from the Massachusetts Department of Conservation & Recreation, the DFW helped to complete detailed assessments for the five ecoregions within the Berkshire area of western Massachusetts, and took the lead role in developing a complete draft assessment for the Connecticut River Valley ecoregion of Massachusetts.

DFW foresters completed the final draft plan for the DFW Berkshire Highlands Forest Management Zone (FMZ), and began a draft plan for DFW Connecticut Valley FMZ. The final draft of the Berkshire Highlands FMZ plan will be presented at a public meeting in FY 2007. FMZ plans describe current forest conditions, establish a desired future condition, and describe active and passive management practices intended to achieve the desired condition on DFW lands within an ecoregion context.

Also, in cooperation with forest managers from the Massachusetts Department of Conservation & Recreation, and with forest policy specialists from the Massachusetts Executive Office of Environmental Affairs, DFW foresters completed a science-based process that established nine large (matrix) forest reserves representing seven different forest ecosystem types within relatively un-fragmented forest areas of Massachusetts. Additional small (patch) reserve sites will be identified in FY 2007 (see http://www.mass.gov/envir/forest/pdf/whatare_forestreserves.pdf).

Forest Inventory & Analysis

DFW foresters and contracted vendors completed a total of 600 forest inventory points covering 24,000 acres in FY2006. Overall, 1,160 sample points representing 46,000 acres have been completed over the past three years. The forest inventory provides a comprehensive assessment of wood products, as well as shrub and herbaceous cover on DFW lands.

In FY06, the DFW, as part of its forest inventory, completed a four-year effort to identify functional vernal pools on all portions of state wildlife lands that might be impacted by forest harvest operations. Over the past four years, DFW Foresters and contractors have visited 484 potential vernal pools (PVPs) mapped by NHESP on DFW lands. Of these 484 PVPs, 271 were found to be functional pools. In addition, during the course of this field work, 109 functional vernal pools were discovered and mapped that had not been part of the NHESP PVP datalayer. Overall, a total of 380 vernal pools have been documented through this effort. Knowledge of vernal pool locations is important for planning forest management activities because timber harvesting is often restricted in the immediate vicinity of these pools to help conserve the rare species that utilize the pools.

In FY06, the DFW also completed a two-year effort to locate, sample, and map priority natural communities of rich mesic forest on DFW properties. Of all priority natural communities in Massachusetts tracked by the Natural Heritage and Endangered Species Program, rich mesic forest is most likely to be impacted by timber harvest operations because this community can potentially support high quality/high value northern hardwood timber products (e.g., white ash, sugar maple). For example, non-native invasive plants may be carried into, and become established within, these communities during harvesting, and invasive plants can displace rare native herbs associated with rich mesic forest. More directly, a change in light levels or moisture regimes may negatively impact rare native plant assemblages. Even timber harvests that occur outside of a rich mesic community can impact these unique sites if water and nutrient flow into the community is disrupted by heavy machinery operating up slope of the community.

The Forestry Program worked cooperatively with the University of Massachusetts Cooperative Extension Service in Amherst, and with NHESP to identify potential rich mesic forest sites on DFW lands. Knowledge of existing rich mesic sites was coupled with attributes such as slope, aspect, landform, bedrock geology, and documented occurrences of rare plant species associated with this community (e.g. Goldie's Fern (*Dryopteris goldiana*), Hairy Wood-mint (*Blephilia hirsuta*), Broad Waterleaf (*Hydrophyllum canadense*), Woodland Millet (*Milium effusum*), and Hitchcock's Sedge (*Carex hitchcockiana*).

At the beginning of this effort, NHESP had confirmed records for 125 acres of rich mesic forest on DFW lands. Through the recent cooperative effort, a total of 140 polygons representing nearly 1,200 acres of additional potential rich mesic forest were identified on DFW lands. During the spring of 2005 and 2006, all 140 polygons were visited by field staff, and 35 polygons (25%) were found to support a total of about 319 acres of rich mesic forest. Combined with the original 125 acres of rich mesic forest that had previously been identified on DFW lands by NHESP, there are now about 444 acres of rich mesic forest mapped and inventoried on state wildlife lands. At this point, all known potential rich mesic sites have been visited, and absent any new information on potential rich mesic forest that may come to light, this effort is now finished.

A complete floristic inventory was conducted at each of these sites using a modified Natural Heritage "Form3" sample (typically a 15 x 15 m sample plot). Herbaceous and woody plant species typically observed at these newly documented rich mesic forest sites include Sugar Maple (*Acer saccharum*), Basswood (*Tilia americana*), Hophornbeam (*Ostrya virginiana*), Wild Leek (*Allium tricoccum*), Broad-leaved Toothwort (*Dentaria diphylla*), Maidenhair fern (*Adiantum pedatum)*, Blue Cohosh (*Caulophyllum thalictroides*), Glade Fern (*Diplazium pycnocarpon*), and Plantain-leaf Sedge (*Carex plan-*

taginea), among many other plant species. Observations included new element occurrences of rare plants. Any forest harvesting operations that may occur near documented rich mesic forest sites will be designed to conserve these communities.

Forest Cutting Operations & Management Activities

DFW foresters initiated five timber sales in FY06, including 19 acres on the Tracy Pond portion of the Peru W.M.A., 62 acres on the Birch Hill W.M.A., 23 acres on the Moose Hill W.M.A., 35 acres on the Phillipston W.M.A., and 30 acres on the Herm Covey W.M.A. Following a review of these five forest cutting plans by the Natural Heritage and Endangered Species Program, rare species concerns were identified at two of the sites: Herm Covey and Birch Hill W.M.A.s. NHESP provided mitigation to protect rare species at these sites, including restrictions on timing and intensity of harvesting. DFW Foresters are involved in every sale preparation and they supervise the resultant logging activities.

Biological Monitoring

Breeding bird surveys were conducted on portions of the Hiram Fox W.M.A. in Chester in June, 2006. Data analysis indicated that a diverse and relatively stable breeding bird community occurs at the Hiram Fox site. In addition, a cooperative research project with the U.S. Forest Service Northeastern Research Station and the Massachusetts Audubon Society investigated breeding bird diversity as well as bird nesting success continued at a previously harvested site on the Fox Den W.M.A.

Vascular plant surveys were conducted at all five of the timber harvest sites initiated in FY06. The relative abundance of all vascular plants in the forest understory and overstory is noted during these surveys, and special attention is given to identifying invasive, exotic plant species for subsequent control efforts, and to identifying any rare plants that were not previously known on the site in order to design appropriate mitigation during harvesting activities.

The Upland Habitat Management Program

The Upland Habitat Management Program (Upland Program) is a component of the Biodiversity Initiative established under the 1996 Open Space Bond Act to maintain and restore native diversity of flora and fauna through active land management. The Upland Program focuses on reclaiming abandoned field and other early-successional habitats, which have become increasingly scarce over the past 75 years.

The specific goals of this program are to:

1) Foster and apply the best available science to identify appropriate sites for management of declining early-successional habitats (e.g. abandoned agricultural fields, aspen forest stands, abandoned orchards) while maintaining extensive, unfragmented forest lands.
2) Implement strategies and techniques to manage and restore declining early-successional habitats to ensure that they continue to support native flora and fauna.
3) Systematically monitor the effects of habitat management on plant and animal communities to ensure that managed habitats continue to support the native biodiversity of Massachusetts.
4) Identify habitats where Upland Program objectives are complementary with Ecological Restoration Program objectives and pursue joint endeavors with that program.

Upland Habitat Project Accomplishments

Cass Meadows of the Millers River W.M.A.

Abandoned agricultural land on the floodplain of the Millers River was reclaimed in December 2005. A mower was used to clear most trees and shrubs on 26.2 acres. Native shrubs including silky dogwood and Northern arrowwood were retained. Invasive exotic plants, primarily glossy buckthorn, were spot-treated with a foliar herbicide. Rare species that have been recorded at Cass Meadows, such as wood turtle and Golden-winged Warbler, should benefit from this management.

Crane W.M.A.

Invasive plants (e.g. autumn olive) were selectively treated with a foliar herbicide application on 84.2 acres. Invasive plant control will increase the habitat quality for rare species including the Grasshopper Sparrow.

Fox Den W.M.A.

Reclamation of a ~10 acre abandoned orchard and regeneration of 7.6 acres of aspen forest was completed in the first phase of a two-year project. In November 2005, DFW employees licensed as Massachusetts pesticide applicators performed a selective cut-stem herbicide treatment to invasive exotic autumn olive in a ~1-acre patch in the orchard. In March 2006, a tree shear was used to cut most trees over 4" dbh, and a skidder pulled trees into piles that were immediately burned. In June 2006, a contractor spent six days with a stump grinder and a mower in the reclaimed orchard to reduce stump heights, manage resprouting woody plants, and thus reduce long-term maintenance mowing costs. Additional control of exotic species and an additional ~25 acres of aspen forest regeneration are scheduled for the second phase of the project in 2007.

Peru W.M.A.

Most of the 14-acre abandoned orchard, reclaimed during summer 2005, was re-treated in June 2006. A contractor spent eight workdays with a stump grinder and a mower to reduce stump heights and manage the response of resprouting woody plants, reducing long-term maintenance and mowing costs.

West Hill Dam Project, U.S. Army Corps of Engineers

The DFW holds a lease for wildlife habitat management on a portion of this Army Corps property in Northbridge/Uxbridge. The Army Corps and the DFW cooperated to complete the tree/brush clearing phase

of a two-year grassland reclamation project. Two Brontosaurus mowers, a tree shear, skidder, and whole-tree chipper were used to clear plantation red pine and old field white pine on 18.7 acres in February 2006. A Massachusetts-licensed pesticide applicator spent one workday performing a spot-treatment of resprouting invasive exotic plants (e.g. Asiatic bittersweet) in summer 2006. The next phase of the cooperative project involves rehabilitation of a 2-acre construction fill area in the middle of the grassland area that will receive soil amendments and be planted with native warm season grasses and forbs in 2007.

Winimusset and Moran W.M.A.s

The abandoned fields at Winimusset and Moran W.M.A.s were originally reclaimed in 1997-98, the first projects implemented by the Upland Program. Bird monitoring data collected since reclamation at both sites has documented a rapid increase in the abundance of bird species of conservation concern in the initial years following reclamation, followed by a decline as the vegetation grew beyond optimum conditions for these species. Because the monitoring data indicated that maintenance mowing of these sites was warranted, 35.8 acres at Winimusset and 28.3 acres at Moran were mowed in 2006. The remainder of the original reclaimed acres at both sites will be mowed in 2-3 years so that varying successional habitat stages will be present, increasing benefits to a broad range of species of conservation concern. Invasive exotic plants including glossy buckthorn and multiflora rose were treated selectively at both sites with a foliar herbicide application.

Biological Monitoring

Site Monitoring

To determine the effects of habitat treatments over time, the Upland Program conducts long-term pre- and post-treatment monitoring of birds and vegetation on reclamation sites. Survey data is entered into the Upland Program's Microsoft Access database (now containing over 11,000 bird records), and is then used to assess the response of native species to management and to guide future habitat management actions. During June 2006, vegetation and breeding bird surveys were conducted on 11 current and prospective reclamation sites across the state.

Evaluation of Bird Habitat Use of Upland Program Sites

Results of the bird monitoring program indicate that management efforts are highly successful at increasing the abundance of early-successional diurnal songbirds during the breeding season. The Upland Program, the U.S. Forest Service Northeast Research Station, and the Massachusetts Audubon Society began a cooperative project which will distinguish differences in the use of Upland Program sites and clearcuts of crepuscular birds, i.e. American Woodcock and Whip-poor-will. An additional goal of the project is to characterize the bird community use of Upland Program sites during the post-fledging period. This research project will continue in FY07.

Coverts Program

The Upland Program provided $12,000 to fund the Coverts Program, a three-day forestry and wildlife habitat conservation workshop for individuals who are in a position to impact conservation in their communities, for example by serving on the Conservation Commission, or by owning a large, undeveloped property. The community leaders that participated in the October 2005 workshop are responsible for the stewardship and management of more than 12,500 acres of forestland across the Commonwealth. Dr. David Kittredge, the UMass Cooperative Extension forester, organizes the workshop, and invites knowledgeable speakers to discuss topics including Massachusetts land use history, the Forest Cutting Practices Act, elements of wildlife habitat, habitat management techniques, and habitat types including early-successional habitats.

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Landowner Incentive Program

Ken MacKenzie
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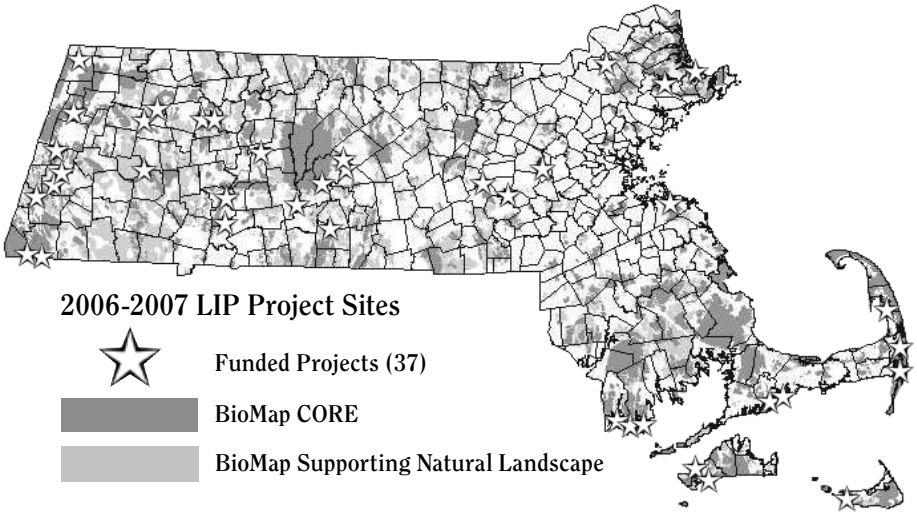
Figure 1. 2006-2007 Landowner Incentive Program (LIP) Projects



The Massachusetts Landowner Incentive Program (LIP) addresses the conservation and restoration of wildlife habitat on private lands identified by the BioMap project as being critical for species-at-risk conservation.

Private landowner participation is fundamental to the successful conservation of fish and wildlife in Massachusetts and to meet the challenges associated with habitat management. Many landowners want to do the right thing, but do not know where to start. Recognizing this, the LIP Program establishes a partnership between state biologists and landowners through which landowners work toward their land management goals. These partnerships promote and educate landowners about management techniques that increase the biodiversity of Massachusetts through land and wildlife stewardship. The LIP Program also helps private landowners bear the financial burden of such habitat management. This cost-share program aids landowners with funding to resourcefully and responsibly manage wildlife habitat, conserving natural communities and species-at-risk, as a viable means of protecting our natural heritage.

Funding for this program was allocated by Congress through the U.S. Fish and Wildlife Service (USFWS) to support the efforts of state fish and wildlife agencies. States must compete to receive these funds. The Division has been successful in receiving LIP grant funds in each year that they have been available.

Land Stewardship is increasingly important in Massachusetts. Land is being developed at a rapid pace and certain habitats (especially dynamic habitats like grasslands and young forests) are being lost. Large areas of open land (farms) are being sold for development as the property is passed from one generation to the next.

A 50-acre grassland restoration project in Williamstown, MA

140-acre calcareous fens bordered by red maple-tamarack swamp in Sheffield, MA

The LIP provides landowners interested in restoring and maintaining wildlife habitat on their property with financial and technical assistance. Currently the goals of the program are to:

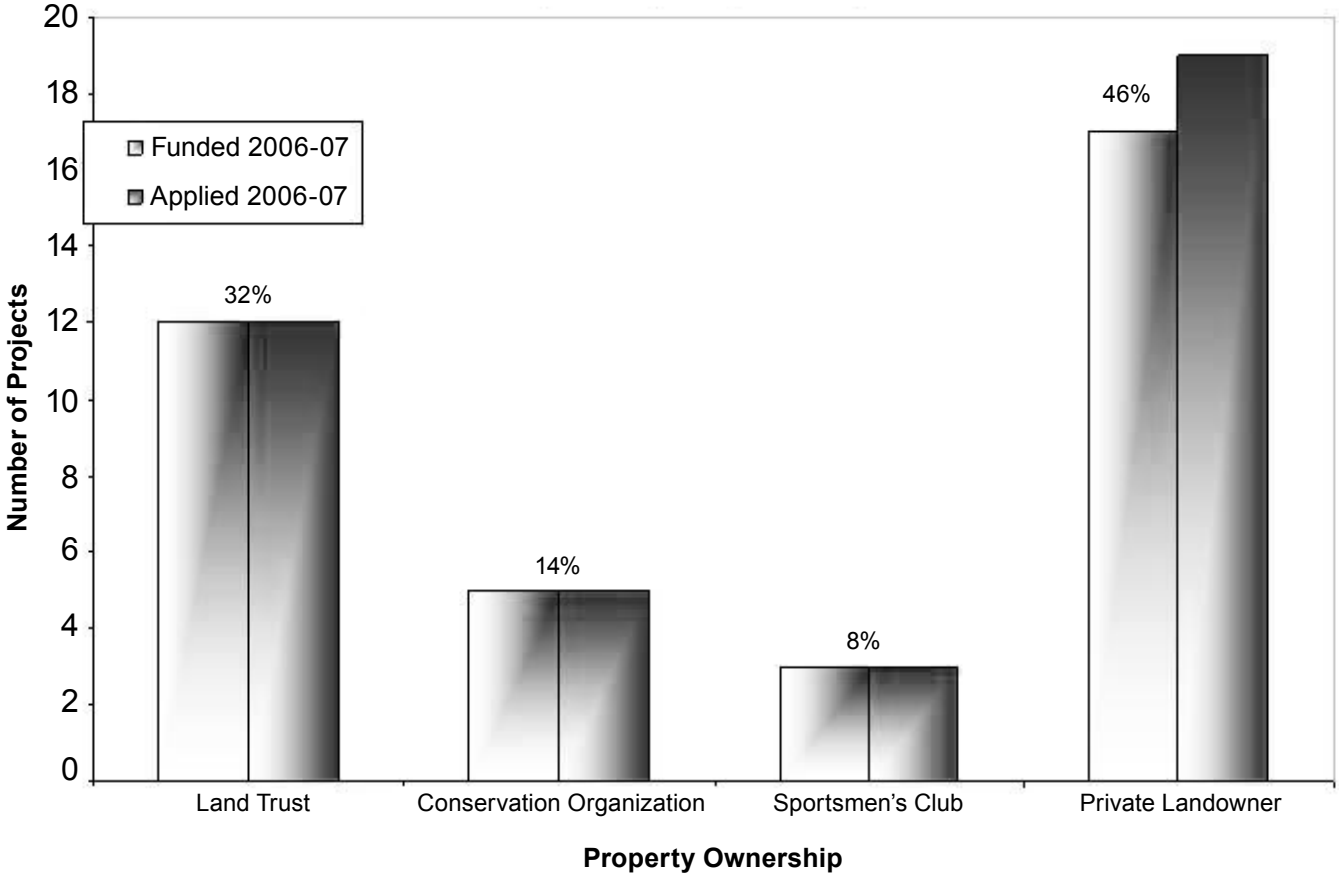
1. Identify and reclaim appropriate sites for management of declining habitats (especially open land: old field and early-successional forest, wetlands, coastal habitat and pine barrens).
2. Manage and control exotic and invasive plants.
3. Enhance wildlife habitat for species-at-risk.
4. Provide technical and financial assistance and guidance for landowners to manage their property for wildlife.

LIP Update

During FY 2007, LIP received applications for species-at-risk habitat improvement/restoration on about 2000-acres of private lands. Of these applications, 37 were selected for funding in FY2007 (Figure 1). Eight (8) of the 37 projects selected will require a LIP Covenant that will be filed with the deed for 10 years. MassWildlife will be partnering with these private landowners on 1,973 acres, funding projects for $845,000.

- Of the 37 projects awarded, 12 went to land trusts, 5 to conservation organizations, 3 to sportsmen's clubs, and 19 to other private landowners (Figure 2).

Figure 2. Projects by Ownership

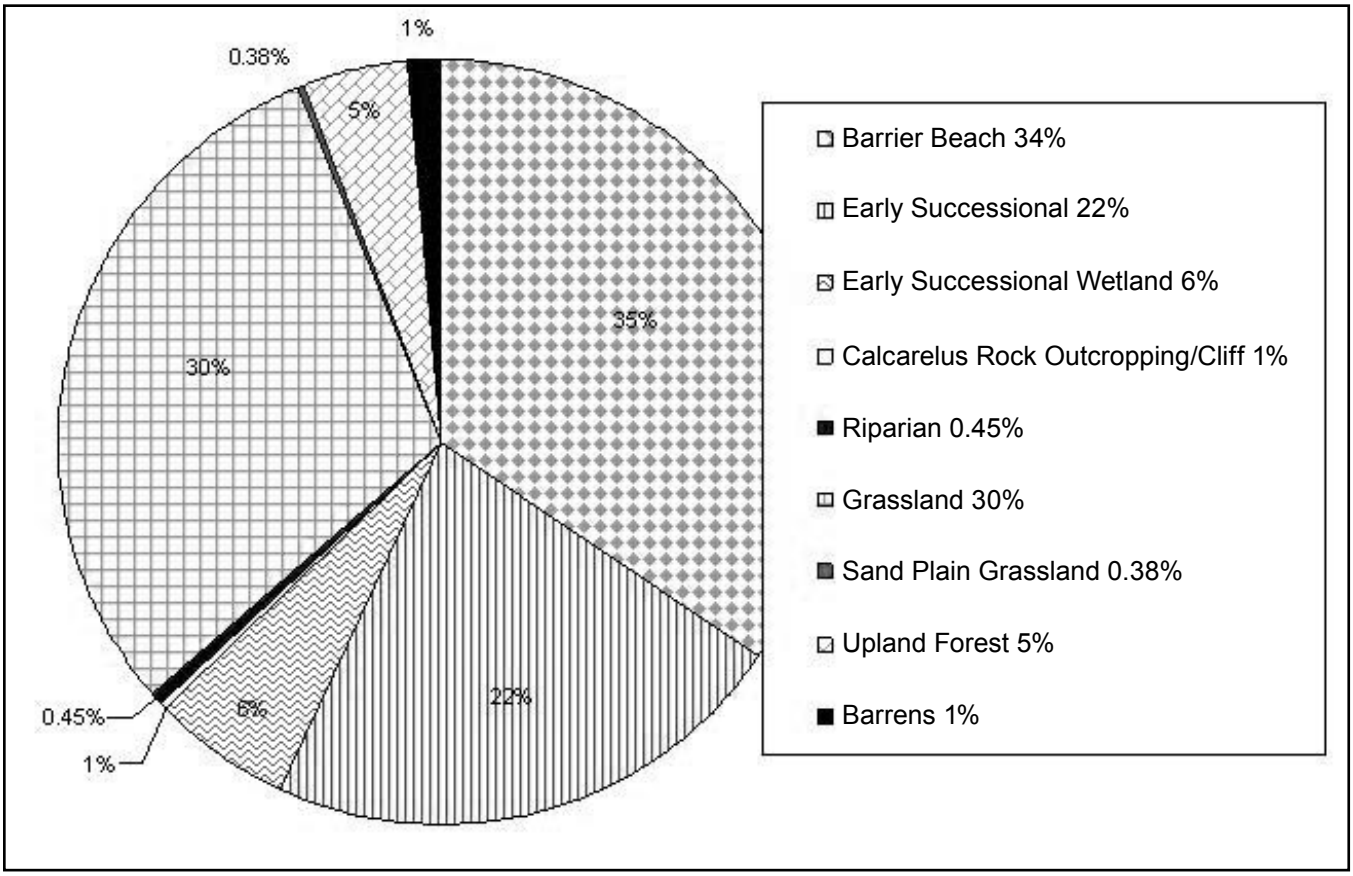


- Of the 1,973 total acres involved in the projects awarded, 1,077 acres were in coastal habitats, 710.5 acres were in early successional upland, 195 acres were in early successional wetlands, 937.3 acres were in grasslands, and 11.8 acres were in Pitch pine-Scrub oak forest (Figure 3).
- Of the projects awarded, 78% had permanent protection, 16% were enrolled in Chapter 61, and 5% had no conservation protection. The projects without land protection were required to sign a land covenant requiring the landowner to keep the project area as wildlife habitat for a minimum of 10 years.
- Of the projects awarded, 100% applied for manual restoration, 89% applied for an invasive/exotic plant removal, 51% applied for the seeding or planting in their project area, and none applied for a prescribed burn.

The 2006-2007 Massachusetts LIP Projects will benefit hundreds of native plant and animal species. Natural Heritage has identified at least 122 species-at-risk of statewide importance that will benefit from this year's projects (15 invertebrates, 69 vascular plants, and 38 vertebrate animals).

To date, MassWildlife has funded 54 different landowners through LIP projects and has provided technical assistance to over 200 landowners on nearly 5,000-acres of private land across the state from Cape Cod to the Berkshire Mountains (Figure 4). Through this program MassWildlife has contributed over $1.4 million to the conservation of wildlife species-at-risk on private land over the program's two year history.

Figure 3. Acres by Habitat



The Landowner Incentive Program focuses on upland habitats in decline in Massachusetts. Specifically LIP is working with landowners on restoring grasslands, old fields, pitch-pine scrub oak and beach habitat and early successional habitat. Additionally, controlling invasive plants such as buckthorn, multiflora rose and oriental bittersweet are among the priorities of LIP.

NATURAL HERITAGE & ENDANGERED SPECIES PROGRAM

Thomas W. French, Ph.D.
Assistant Director for Natural Heritage and Endangered Species

Rare Species Habitat Mapping

The Natural Heritage and Endangered Species Program (NHESP) began a multiyear project to delineate the rare species habitat footprint associated with each observation point for all current observations of 442 rare plants and animal species. This project was made possible with special bond funding from the Executive Office of Environmental Affairs and through funding by State Wildlife Grants from the U.S. Fish & Wildlife Service.

At the beginning of FY06, the NHESP hired four new contracted Conservation Assistants to help with data entry and habitat delineation. These new staff worked together with many of the existing Natural Heritage staff so that by the end of FY06, Natural Heritage biologists had digitally delineated over 5000 habitats for all MESA-listed rare species observed in the past 25 years. These habitat footprints are a powerful new foundation for much of Natural Heritage's conservation and regulatory activities. Natural Heritage is committed to maintaining and updating these habitat footprints as new rare species data is received.

The first application of these habitat footprints was to provide a basis for revised Priority and Estimated Habitats, the regulatory areas that are used to screen potential development projects or activities for rare species impacts under the Massachusetts Endangered Species Act and the Wetlands Protection Act. These revised Priority Habitats and Estimated Habitats were designed to reflect approved changes to the MESA list of rare species. By the end of FY06, Priority Habitats and Estimated Habitats were drafted and plans were in place to complete the final GIS processing. The map template for displaying Priority Habitats and Estimated Habitats against aerial photographs was finalized for the large-sized town maps. The text content and map layout for the 12th Edition of the Natural Heritage Atlas were drafted, with publication scheduled for September 2006.

DCR Biodiversity Stewardship Initiative

In the spring of FY06, NHESP staff worked with the Office of Natural Resources in the Department of Conservation and Recreation (DCR) to develop ways of providing biodiversity data products and technical assistance for the management of Massachusetts' forests, parks, and reservations. The project was made possible through special bond funding by the Executive Office of Environmental Affairs.

DCR and Natural Heritage worked together to develop the most effective way for Natural Heritage to deliver biodiversity information and management recommendations for DCR's baseline resource management plans and to help guide DCR land managers in the on-site management of rare species habitat. Natural Heritage developed a way to aggregate and synthesize the new rare species habitat footprints and existing natural community information to provide coherent management recommendations for seamless use by DCR. This approach was applied to two DCR properties as pilot studies: Mohawk Trail State Forest in the northern Berkshires and Horseneck Beach State Reservation in Buzzards Bay. A draft 200-page report and GIS shape files were submitted to DCR and, pending funding, the project is planned to expand to other properties in FY07.

2005 Field Season Summary

Birds

Bald Eagle: During the summer of 2005 there were 19 territorial pairs of Bald Eagles in Massachusetts. Of these, 17 pairs laid eggs and 12 pairs successfully fledged 23 chicks. In 2004, there had been 3 fewer territorial pairs, but the same number of successful pairs (12) that fledged only 16 chicks. This is the 16th year that Bald Eagles have raised young in Massachusetts since their restoration. During these 16 years a total of 193 chicks are known to have fledged from wild nests.

Peregrine Falcon: The number of pairs of Peregrine Falcons increased from nine in 2003, to 11 in 2004, to 13 in 2005. Of these, ten pairs laid eggs, nine pairs hatched eggs and five pairs successfully fledged 13 chicks (ten female and three male). This compares to the nine pairs that successfully fledged 27 chicks in 2004. The greater losses of eggs and young chicks this year was thought to have been caused by spring rain storms. New territorial pairs were located this year on the Deer Island Sewage treatment facility, Boston; and on the City Hall tower in Holyoke.

Common Loon: In 2005, a network of cooperators continued to monitor territorial and nesting Common Loons (*Gavia immer*) in northern and central Massachusetts. Loon numbers decreased slightly from the

previous year, but loon activity was observed at more waterbodies. Twenty-seven territorial pairs of loons were observed on twelve waterbodies, compared to 28 pairs on ten waterbodies in 2004. Thirteen pairs of loons nested (*vs*. 19 pairs in 2004) resulting in sixteen fledglings. Using only data from confirmed fledgling sightings in September, the productivity estimate of loons was 1.45 fledglings per nesting pair, and 0.64 fledglings per territorial pair; the highest productivity estimates since 1981.

Terns, Laughing Gulls, Black Skimmers: Cooperators in Massachusetts surveyed 124 coastal sites in 2005 for the presence of breeding Roseate Terns (*Sterna dougallii*), Common Terns *(Sterna hirundo*), Artic Terns (*Sterna paradisaea)*, Least Terns (*Sterna antillarum*), Laughing Gulls (*Larus atricilla*), and Black Skimmers (*Rhynchops niger*). Seventy-nine sites were occupied by nesting birds of one or more of these species. Common Terns nested at 34 sites and decreased 5.6% from 16,372 pairs in 2004 to 15,447 pairs in 2005. Numbers of Roseate Terns (five sites with 1,503 pairs; down 1.4% from 2004,) Least Terns (60 sites with 2,657 pairs; down 1.3% in 2005), Laughing Gulls (1,312 pairs nested only at Monomoy Island; down 0.8%), Arctic Terns (3 sites with 6 pairs in both years) and Black Skimmers (2 sites with 5 pairs vs. 6 pairs in 2004) were similar to 2004 figures.

Piping Plover: A coast-wide network of cooperators reported breeding Piping Plovers at 109 sites in Massachusetts during May and June, 2005. An additional 57 potential nesting sites were censused, but no breeding pairs were detected. The preliminary estimated breeding population for the state was 470 pairs; data compilation is still on-going. Largest numbers of breeding pairs were at South Beach in Chatham (41 pairs), Crane Beach, Ipswich (30), Sandy Neck, Barnstable (29), and Dead Neck/Sampson's Island, Barnstable (20). Overall reproductive success for the Massachusetts breeding population was approximately 1.0 chicks fledged per pair; this estimate may change slightly once all data have been checked and tabulated.

American Oystercatcher: Observers reported a total of approximately 180 breeding pairs of American Oystercatchers at 62 sites in Massachusetts during May and June, 2005. No oystercatchers were detected at an additional 101 sites that were censused. Data on abundance, reported both as numbers of breeding pairs and numbers of adults, are still being quality checked and compiled. Individual sites with the largest numbers of pairs were the Coskata-Coatue area of Nantucket (31 pairs), South Monomoy Island, Chatham (11), North Monomoy Island, Chatham (11) and Norton Point Beach, Edgartown (8). Data on reproductive success (chicks fledged per pair) are still being quality checked and tabulated.

Reptiles and Amphibians

Red-bellied Cooter: In 2005, a total of 59 nests were located at the primary nesting pond by contractor John Crane. These nests contained 738 eggs (average = 12.5 eggs/nest), of which 488 hatched (8.3 hatchlings/nest). Of these, 156 were kept for headstarting and 338 were released directly into the wild where they hatched. In addition, seven nests had been preyed upon during the nesting period (June 8-July 17) and 11 more were found raided by predators later in the summer. The total number of nests documented was 77.

Plants

Rare Plants Inventory: Staff Botanist Melissa Dow Cullina worked with cooperating botanist Arthur Haines to rediscover the Laurentian Bladder Fern, *Cystopteris laurentiniana*, in Massachusetts. This plant had originally been discovered in the state in the Connecticut River Valley on July 5, 1976. Unknown to Massachusetts botanists, the voucher specimen had been collected and deposited in the University of Vermont herbarium. After its significance was recognized by Arthur Haines, an effort to relocate this population was planned for the summer of 2005. On June 15, 2005 several small but healthy sub-populations of Laurentian Bladder Fern were discovered in the vicinity of the original collection site. Future efforts will focus on similar habitats in other parts of the Connecticut Valley to see if this species may occur more widely than is currently known. In other field work, efforts to re-confirm location of Wright's Panicgrass, *Dichantelium wrightianum*, (Special Concern); Fries' Pondweed, *Potamogeton friesii* (Endangered); and Hill's Pondweed, *Potamogeton hillii* (Special Concern) were successful, while efforts to relocate a population of Houghton's Flatsedge, *Cyperus houghtonii* (Endangered) were not.

Federally Listed Species: Small Whorled Pogonia (*Isotria medeoloides*) (state Endangered, federally threatened): A site visit was made to the largest population and assistance was provided to help develop conservation restrictions to protect the site. No population surveys were done in 2005, but a couple of sites were monitored by volunteers.

Sandplain Gerardia (*Agalinis acuta*) (Endangered): The monitoring history of each of the natural and restored populations on the Cape and Islands was prepared in order to update records and augment the preparation of a new Recovery Plan being written. Monitoring was conducted on the Cape by Pamela Polloni *et al*. under contract to the USFWS, and by Brendan Annett at Waquoit Bay National Estuarine Research Reserve. Arrangements were made with The Nature Conservancy to monitor the natural population on Martha's Vineyard. All populations showed a decline in numbers and plant vigor in 2005. The main cause appeared to be drought.

Invasive Species: Staff continued to work with the Massachusetts Invasive Plant Advisory Group (MIPAG) throughout the year. The Group's final list of 66 species recognized as "Invasive," "Likely Invasive" or "Potentially Invasive" in Massachusetts was presented to the Executive Office of Environmental Affairs as part of its "Strategic Recommendations for Managing Invasive

This column: *Japanese Hops,* Humulus japonicus Sieb. & Zucc.*, is listed as "**Likely Invasive**."*
Top photo: *John Randall, The Nature Conservency.*
Inset: *Rachel Kramer.*

Next column: *Japanese Barberry,* Berberis thunbergii DC.*, is listed as "**Invasive**."*
Top photo: *Bill Byrne* • ***Bottom:*** *Rachel Kramer*

Plants in Massachusetts." The list was well received. One outcome of finalizing these products was a decision by the Department of Agriculture to enact regulations to ban the further importation and sale of the 66 species listed by MIPAG starting in 2006 for most species. For some of the commercially important species, a 1 to 3 year phase out on sales will be allowed in the new regulations. A new edition of "A Guide to Invasive Plants in Massachusetts" was initiated with The Nature Conservancy, Division staff, and the New England Wild Flower Society taking the lead on this project. The new Guide will be an identification reference for all 66 of the species on the MIPAG approved list. Invasive plant information was prepared for the Natural Heritage web site and an article entitled "The Invasive Plant Problem" was published in an issue of *Massachusetts Wildlife* to accompany an editorial by Director MacCallum.

Small Research Contracts

Small Research Contracts

The Program was unable to fund new Small Research Projects this fiscal year due to a shortage of funds.

Environmental Review

The following table summarizes the environmental reviews conducted during FY06.

Review Type	Count
Conservation and Management Permit	23
Data Release	87
MESA Information Requests	495
MESA Review	245
Forest Cutting Plan	126
MEPA	135
Notice of Intent	1080
Scientific Collection Permit	94
Other	97
Total	2382
Vernal Pools Certified	500

Data Management and Data Products

	New Records	Updates to Existing Records
Vertebrates	172	811
Invertebrates	109	242
Plants	128	1068
Communities	26	24

Land Protection

In FY06, MassWildlife spent over $9 million to protect approximately 2,898 acres of land across the state, bringing the agency's total land holdings to more than 160,000 acres (see Wildlife Lands pps x – y). Several of these acquisitions were of particular relevance to the protection of rare species and exemplary natural communities, as noted below.

Western District

In Huntington and Chester, acquisition of 200 acres along the Little River, adjacent to the Hiram Fox W.M.A., protected habitat for the **Endangered Lake Chub** and the **Special Concern Ocellated Darner** dragonfly, as well as part of a **Rich, Mesic Forest**.

Valley District

Twenty seven acres along a tributary to Poland Brook and adjacent to the Poland Brook W.M.A. in Conway were protected. This action secured habitat for **Wood Turtle (Special Concern)** and **Longnose Sucker (Special Concern)**.

Central District

Between the Bolton Flats W.M.A. along the Nashua River in Bolton, Lancaster, and Harvard, and the former Fort Devens, lies a narrow sandy ridge called Pine Hills. Protection of 50 acres on Pine Hills in Lancaster has helped to block further development of this area which is important for rare species, including **Blanding's Turtle (threatened)** and **four moths endemic to Pitch Pine/Scrub Oak woodlands.**

Southeast District

On the northern edge of the Fall River/Freetown State Forest, DFW acquisition of 337 acres helped to extend protection over the land designated as the **Southeast Bioreserve**, which includes the State Forest, the Copicut W.M.A., the Copicut Reservoir, and the Watuppa Reservoir. The newly acquired acreage is a large wetland complex which includes regenerating Atlantic White Cedar swamp, bogs, deep marshes, and open water.

Northeast District

Protection of 49 acres along the Squannacook River in Townsend continued DFW's commitment to protecting this important river corridor, home to **Blanding's Turtle (threatened), Wood Turtle (special concern), rare riverine dragonflies, and rare freshwater mussels.**

Natural Heritage and Endangered Species Advisory Committee

Full members are: Kathleen Anderson (Chair), Marilyn Flor, Joseph S. Larson, Mark Mello, Stephen M. Meyer, Thomas Rawinski and Jonathan A. Shaw.

Associate members are: William Brumback, Brian Cassie, Timothy Flanagan, Glen Motzkin, Blair Nikula, Wayne Petersen, Mark Pokras, Bryan Windmiller

During FY06 the Committee held 10 scheduled meetings. August has been a traditional vacation month for the Committee. All of these meetings were held at the Westborough Field Headquarters.

Business of the Committee included:

- The Committee developed a new protocol for reviewing proposals to amend the Massachusetts List of Endangered, Threatened and Special Concern Species.

- The Department of Environmental Protection released a publication, "Massachusetts Wildlife Habitat Protection Guidance for Inland Wetlands" at the Massachusetts Association of Conservation Commission's annual conference on March 4, 2006. Inside the publication was an introductory letter in which Committee member Dr. Stephen M. Meyer was recognized and thanked for all of his efforts on the project. This effort was initiated as a Committee project on which Steve has worked for the past seven years.

- In addition to programmed agenda items such as the review of proposed changes to the Massachusetts Endangered, Threatened and Special Concern Species List, the Committee continued to be represented on the Massachusetts Invasive Plant Committee by Jonathan Shaw and Bill Brumback.

- **The Committee heard presentations from agency staff on the following issues:**

  * **The Department of Conservation and Recreation's proposed Forest Reserves and High Conservation Value Forests – Pat Swain**
  * **NHESP's Species Habitat Mapping Project – Chloe Stuart**
  * **The development of best management practices for forestry and state-listed reptiles and amphibians – Leslie Bol**
  * **The DFW's Landowner Incentive Program – Ken MacKenzie**
  * **Fuels and fire management for wildlife in Massachusetts – Tim Simmons**
  * **Status of the Spotted Turtle in Massachusetts – Tom French**
  * **An overview of how development projects are affected by NHESP environmental review – Jonathan Regosin**

- **Other presentations to the Committee included the following:**

  * **Massachusetts Important Birds Areas – Wayne Petersen**
  * **Update on mosquito-borne disease of concern to humans – Mark Pokras**
  * **The Massachusetts Environmental Trust – Robert O'Connor of EOEA**

Natural Heritage and Endangered Species Program Staff

Thomas French, Ph.D., *Assistant Director*
Henry Woolsey, *Program Manager*

Kim Ausmus, *Administrative Assistant*
Katie Blake, *Intern*
Leslie Bol, *Reptile & Amphibian Biologist*
Tara Boswell, *GIS Specialist*
Amanda Breon, *Ram Island Assistant*
Christopher Buelow, *Restoration Assistant*
Caroline Causey, *Bird Island Manager*
Rachel Charow, *Bird Island Assistant*
Claire Corcoran, *Plant Mapping Specialist (part year)*
Mary Davis, *Penikese Island Manager*
Melissa Dow Cullina, *Botanist*
Lori Erb, *Turtle Conservation Biologist (part year)*
Heather Foley, *Conservation Data Assistant*
Marea Gabriel, *Aquatic Ecologist*
Jenna Garvey, *Endangered Species Review Assistant*
Sarah Haggerty, *Endangered Species Review Biologist (part year)*
Lynn Harper, *Habitat Protection Specialist*
Tara Huguenin, *Conservation Data Assistant*
Jennifer Loose, *Invertebrate Zoologist*
Misty-Anne Marold, *Endangered Species Review Biologist*
Scott Melvin, Ph.D., *Senior Zoologist*
Carolyn Mostello, *Tern Project Manager*
Daniel Nein, *Endangered Species Review Biologist*
Michael Nelson, *Invertebrate Zoologist*
Jessica Patalano, *Finance and Project Administrator (part year) and Data Manager*
Lisa Plagge, *Conservation Assistant*
Emily Pollom, *Penikese Island Assistant*
Matthew Purvis, *Ram Island Manager*
Jonathan Regosin, Ph.D., Chief, *Endangered Species Review*
Lee Ripma, *Intern*
Rebecca Skowron, *Conservation Assistant (part year) & Endangered Species Review Assistant*
Tim Simmons, *Restoration Ecologist*
Paul Somers, Ph.D., *Botanist*
Deborah Stevens, *Finance & Project Administrator (part year)*
Chloe Stuart, *Conservation Planning Projects Manager*
Patricia Swain, Ph.D., *Natural Community Ecologist*
David Szczebak, *GIS Manager*
Joanne Theriault, *Conservation Assistant/Endangered Species Review Assistant (part year)*
Amanda Veinotte, *Endangered Species Review Assistant*
Kathy Wilensky, *Plant Watch List Coordinator*

INFORMATION & EDUCATION

Ellie Horwitz
Chief, Information and Education

The Information and Education Section has the responsibility and challenge of keeping sportsmen and other constituents apprised of regulations, laws and recreational opportunities related to wildlife. It provides news about wildlife and maintains a flow of information about wildlife related issues. In order to enhance public understanding of wildlife management and compliance with laws and regulations, the Section maintains an active program of educational outreach to develop a public which is aware of, and in tune with, wildlife issues.

Information and Outreach

MassWildlife News

13 issues of the MassWildlife News reporting on wildlife programs and wildlife projects were sent out over the course of the year via email, fax and hard copy. Of the recipients, 3800 receive these news notes by email, 82 receive them by fax and 1500 receive them by surface mail.

Media Services

The agency received 170+ direct media inquiries over the course of the year, mostly from newspapers and some from television stations. Following protocols established in the FY03, staff limit their comments to technical information, while legislative and policy matters are referred to E.O.E.A. spokespeople.

In response to such requests for technical information, in-depth television interviews were set up for:

Channel 7 -- Dr. Tom French on Exotic Animals, October 2005

Channel 5 -- Dr. Scott Melvin on Plovers and Colonial Shorebird Surveys, November 2005

Channel 7 -- H Heusmann on Avian Influenza testing and Goose Banding, June 2006

Channel 4 -- Jim Cardoza on Black Bears, February 2006

Event Advisories

MassWildlife issued eight event advisories notifying ***MassWildlife*** News subscribers about special or time sensitive items. These were:

Aug 05 – Antlerless deer permit selections announced

October 05 – CWD Emergency Regulations Passed

November 05 – Muzzleloader Bill Signed by Governor

February 06 – Sportfishing Award Winners Announced

March 06 – Francis Sargent Award Presented to Russ Cookingham

April 06 – Public Comment Sought on Forest Conservation Management Practices for Rare Species

May 06 – Dedication of a Public Access Point in the Southeast District to Jim Kennedy

June 05 – Redbelly Cooter Marking & Release, Westborough, Lakeville

Items, many of them based on items in the MassWildlife News or on staff interviews, generated numerous articles which appeared in various print outlets. A total of 2384 print items which made reference to the Division of Fisheries & Wildlife were logged in during this fiscal year. This was a slight increase over the 2338 articles recorded in 2005-06. Coverage was quite evenly distributed.

Website

The website continues to be a useful source of information. An increasing number of callers indicate they have access to the Internet. In many of these cases, callers are referred to the website for information about the wildlife species and/or other wildlife issues of interest to them. Media callers note that they find the website information useful as a follow up to their communications with agency biologists.

New pages posted to the website during the year include:

Avian Influenza

Living with Beaver

Living with Skunks

Reformatted and new information on Beavers.

Web redesign in Process – To address the lack of ADA compliance and increasing need for a more user-friendly navigation design, several group meetings were held by the Outreach Coordinator, NHESP staffer Dave Szczebak, and Rick Kennedy IT specialist. A new, ADA compliant web design has been roughed out and shown to a few Senior staff members. There will be further review and the goal is to launch the newly designed site by January 1, 2007.

Response to Public Inquiry

MassWildlife **Email** – The agency received 6615 inquiries via email over the course of this year. These inquiries come to a general mailbox within the electronic system and are parceled out to appropriate respondents on a daily basis. Most of these inquiries are received in

spring and fall and relate to fishing and hunting season questions.

Phone calls – The number of telephone inquiries received by this Section declined by nearly 50%. The number of nuisance wildlife calls was steady and may even have increased, but the burden of calls on staff in this Section decreased primarily because staff of the Wildlife Section fielded the majority of these calls. Other calls related to general wildlife questions, laws, permits, education opportunities, and hunting/fishing questions.

Public Education Programs

Staff members of the Information & Education Section have offered programs to civic, community, conservation and sportsmen's groups about a variety of wildlife issues. Outreach by the Education Coordinator focused on groups of educators, students and youth gatherings, but was also highlighted at other public events. Staff presentations included public appearances at conferences, community reading days, and workshops through which we continue to reach urban youth. Staffers addressed international student groups, Scouts, Department of Youth Services secure treatment residents, pre-service teachers, college students, formal and non-formal students, annual meetings of conservation organizations and a variety of other adult audiences.

Production of Annual Materials

Licenses and Abstracts

Production of licenses, abstracts and stamps ran smoothly with all materials arriving at Field Headquarters on schedule. In addition to the annual Abstracts of Fish and Wildlife Laws and Regulations, abstracts were prepared of the regulations pertaining to the hunting of migratory birds and regulations pertaining to the trapping of furbearers.

Waterfowl Stamps

Artwork for the 2006 waterfowl stamp was selected in a morning competition held at the Cape Cod Museum of Natural History in September of 2005. The five judges selected a painting of a long-billed curlew carved by an unknown carver and submitted by artist Randy Julius of East Bridgewater, MA. Following the contest, the Museum hosted a reception celebrating the waterfowl stamp program and honoring Mr. Julius. The artwork remains on public display at the museum through the end of September and is being much enjoyed by visitors.

Archery and Primitive Firearms Stamps

Design for the 2006 Archery and Primitive Firearms stamps was once again selected in open competition. As judges were profoundly impressed with two different entries – one suitable only for a primitive firearms stamp – two images were selected. Artwork depicting the action of an antique caplock by artist Bill Knox of Vashon, WA will be featured on the 2006 primitive firearms stamp. A whitetail buck standing in snow by artist Joy Keown of Laramie, WY was selected for the 2006 archery stamp.

Publications

The Division's most visible publication is MASSACHUSETTS WILDLIFE, a 40 page, full color quarterly which is sent to more than 23,000 paying subscribers, a rate which appears to be steady. The four issues produced this year, (Fall 2005 - Summer 2006), covered a wide variety of subjects, including resource management, education, habitat enhancement, rare and endangered species, history, general nature interest and "how to" articles for the hunter, fisherman and nature observer. Articles that promoted MDFW programs included an account of the pheasant rearing program at the Worcester County House of Corrections (including a promotional note for the Youth Pheasant Hunting Program); Brood Counts (an article soliciting volunteer reports of wild turkey broods) and MassOutdoors (promoting the purchase of licenses on line.)

Features included articles which focused on squirrels (gray, red and chipmunk); frogs and toads of Massachusetts; the gray seal; and wild flowers (including rattlesnake-like plants.) There were also articles covering hunting and fishing history (rail hunting; brook trout management); another article on our National Wildlife Refuges, and two articles on how to identify and control invasive plant species. There were also a few general interest articles including first person accounts of a novice fur trapper, an article on predator attacks, a trophy deer bow hunt and a nostalgia piece about an old hunting coat.

Other Publications

In addition to the "Annual Materials" noted above, the Section produced and printed (or reprinted) a variety of material needed for the smooth operation of ongoing programs including:

* Permits and associated notification cards
* Deer check station cards
* Books for logging reports of non-hunting deer mortality
* A Brochure introducing MassWildlife

The MassWildlife Pocket Guide to Massachusetts Animal Tracks is one of the Division's most popular handouts.

MASSACHUSETTS WILDLIFE
magazine.

* Massachusetts Wildlife's Annual Report
* Materials for Wildlife Rehabilitators
* Manuals and certificates for Project WILD, Angler Education, and the Junior Duck Stamp Program
* Track cards – used as handouts for public programs
* Handout sheets with information on waters stocked with trout, areas stocked with pheasants, lists of maps of Wildlife Management Areas, new land acquisitions, best bets for bass, waters stocked with northern pike and tiger muskies, and a revised Sportfishing Award affidavit form.

In addition to these items the Division published four new items in the "Living with Wildlife" Series: Living with Moose; Living with Bears; Living with Turkeys; and Living with Wildlife in the Suburbs. It also reprinted the ever popular information sheet on coyotes.

The Division also published an information sheet on "Beavers and the Law: a Citizen's Guide to Addressing Beaver Conflicts" which provides action options for those confronted with damage caused by beaver activity. This publication was designed to accompany another new publication "Living with Beaver in Massachusetts."

Also new this year were:

* A brochure on the Division's new Young Adult Pheasant Hunting Program.

* A full color poster of Esocids (Pickerels, Northern Pike and Tiger Muskellunge) which was designed to protect Northern Pike and Tiger Muskies until they attain the legal size limit.

Extensive editorial time and effort were also spent on:

* A Revision of the Manual for the Sale of Hunting and Fishing Licenses and Stamps (produced in conjunction with the Revenue Section).

* An Upland Habitat Management Manual

This document was prepared for the Northeast Upland Habitat Technical Committee. Services contributed to this project involved extensive copy editing, formatting and layout. At the time of publication the document has been completed, formatted and returned to the Upland Habitat Technical Committee.

* Comprehensive Wildlife Conservation Strategies

This document, prepared at the behest of the U.S. Fish and Wildlife Service, identifies key species and habitats that are in decline or at low levels and that are indicative of the diversity and health of the wildlife in the Commonwealth. It describes and locates the key habitat and community types essential for those species. It identifies the problems facing the key species and/or the habitat and priority research and/or survey needs which might help to improve the situation. It describes appropriate Conservation Action for the key species or habitats, prioritizes implementation, and offers monitoring plans for key species and habitats. A formal informational meeting on this plan, advertised in 18 newspapers, was held by the Fisheries and Wildlife Board on August 25, 2005, in Wareham, MA.

Exhibits

The agency had a presence in the form of a display or exhibit in the following venues:

August
- Animal Day, Sandwich – Thornton Burgess Society
- Marshfield Fair

September
- Tufts Veterinary School Open House, Grafton
- Sterling Fair, Sterling
- Franklin County Fair, Greenfield
- Waterfowl Stamp Reception, Springfield Museum, Springfield
- Massachusetts Waterfowler's Association, Inc Annual Meeting

October
- Topsfield Fair
- *Upton State Forest CCC Dedication

January
- *Girl Scout Cookie Cook Off, Auburn Mall, Auburn

February
- Sportsmen's shows in E. Bridgewater, Worcester, Springfield

March
- Flyfishing Show, Wilmington
- Mass. Association of Conservation Commissions Conference, Worcester
- Land Trust Conference, Worcester
- *Wild Turkey Federation fundraiser, BOW exhibit table, Spencer

April
- *Natural Communities Symposium, Easton
- *MassWildlife at Project S.A.I.L's 6th Annual Nature Day, Sandwich

* Asterisk indicates first time participation at event or venue.

- *BOW at Women's Health Fair in UMass Medical in Worcester
- Angler Ed at Springfield Science Museum for Earth Day festivities

May

- CCC Camp Day at Upton State Forest

Photography

Staff photographer Bill Byrne continues to provide images in support of agency programs. In addition to shooting specifically for the magazine, the photographer has the important quarterly task of reviewing all available images, making certain that there is a sufficient supply of high quality images for the editor's selection process, assisting with final image selection for each issue, and providing images, as requested, to other individuals and organizations working for wildlife and protecting the lands and natural resources of the Commonwealth.

This year the photographer specifically documented activities at the Massachusetts Junior Conservation Camp in Chesterfield, the Massachusetts Outdoor Expo in Sturbridge, the Sport Fishing Awards presentations in Worcester, the Junior Duck Stamp Awards in Hadley, and the Massachusetts Envirothon, held in Uxbridge this year. He also spent time documenting agency research and management programs, including the winter Beaver transect survey, collaring and banding of Canada Geese, Black Bear telemetry research, collaring of Moose, and controlled burns at Montague Plains. In addition to covering programs and projects, the photographer maintained visual documentation of the renovation project at the Division's Field Headquarters in Westboro.

Assignments for Massachusetts Wildlife magazine included preparation of photography for feature articles on ice-out fishing, under-ice wintering redspotted newts, spring woodcock display, and collaring of flightless Canada Geese for a research effort.

In addition to his ongoing photo documentation of MassWildlife's projects and programs, the photographer has worked extensively to apply the techniques of film photography to the digital format and to become proficient with digital equipment and techniques. This is not only a function of keeping abreast of current technology, it is also a key step toward establishing an on-line photographic library for staff use. To this end the photographer attended a workshop on digital image capture and modification presented by the Nikon School of Photography. Using these new techniques he has become proficient with the digital camera and has been providing images for the magazine and for MassWildlife's archives in this format.

Education Programs

Formal or School-based Education Programs
Pam Landry Coordinator

Project WILD: A cadre of volunteer facilitators offered 39 Project WILD workshops including 14 WILD, 2 Aquatic WILD, 13 combination WILD/Aquatic WILD, 1 combination WOW! (The Wonders of Wetlands)/WILD/Project Learning Tree , 2 combination Aquatic WILD/WOW!, 1 combination Aquatic WILD/Project WET. These workshops reached a total of 414 teachers of Grades K-12 from across the state. Six workshops were cancelled due to low enrollment.

Project WILD partnered with Environmental Concern, Inc. (St. Michaels, Maryland) to host three WOW! "The Wonders of Wetlands" workshops as well as a POW! "Planning of Wetlands" workshop. These workshops were attended by 70 educators.

Two field opportunities were offered to facilitators. The annual black bear field experience was offered in March with participants observing and participating with MassWildlife biologists as data was collected on a radio collared sow & cubs. Spring brought facilitators to a tributary of the Connecticut River where they stocked Atlantic salmon fry.

The annual facilitators' gathering was held at the USFWS Great Falls Discovery Center, Turners Falls, where participants spent the day learning about the natural history of anadromous fish in Massachusetts. They received program updates, and were recognized for their contributions to the agency's educational outreach!

Junior Duck Stamp Program (JDS): Students in grades K-12 submitted 410 pieces of artwork to this "conservation through the arts" program. Entries were received from public, private and home schooled students, scouts, individuals, & private art studios. Judging by a panel of five wildlife artists took place at USFWS Great Falls Discovery Center. The awards ceremony, attended by students, families, teachers, and sponsors was held at USFWS Region 5 Headquarters. The painting of a Canada goose by Daniel Quirk, Springfield Central High School, was selected as Best of Show and represented Massachusetts at the National Competition. Combinations of the top 100 pieces of art were part of a statewide traveling exhibit appearing in 13 different venues. The Buttonwood Park Zoo hosted a waterfowl drawing workshop for students presented by Maura Conron, artist and past JDS judge. Sponsors of the JDS program include MassWildlife, USFWS, Massachusetts Waterfowlers, Inc., Boston Duck Tours, Mass Wildlife Federation, and the Mass Chapter of Ducks Unlimited.

Massachusetts Envirothon : The Division, through its involvement in this natural resource education program, reaches over 500 high school students annually through a combination of teacher and student workshops. The Education Coordinator serves on the state education committee, prepares the wildlife exam, attends monthly committee meetings, and serves as staff on the day of the competition. Other Section staff members participate in this program by offering workshops, serving as station staff and serving as judges on Competition day.

Skills Programs

Hunter Education Program **

Susan Langlois, Coordinator

It is the mission of the Massachusetts Hunter Education Program to protect the lives and safety of the public, promote the wise management and ethical use of our wildlife resources, and encourage a greater appreciation of the environment through education. The Hunter Education Program is a public education effort providing instruction in the safe handling of firearms and other activities related to hunting and firearm use. Funding is derived from the sale of hunting and sporting licenses, and from federal excise taxes on firearms and archery equipment. Massachusetts offered its first hunter safety course in 1954, and to date has graduated more than 161,000 students. The program is administered by the Massachusetts Division of Fisheries and Wildlife and courses are taught by certified volunteer instructors. All courses are free of charge.

Courses

Courses were offered in six disciplines across the state. A total of 3592 students participated in the Hunter Education Program in FY06. Participation levels increased 22% from FY2005 (2935 students) and is consistent with the five year average of 3,359 students. The following is a summary of course offerings and statistics on student participation:

Basic Hunter Education courses provide information on the safe handling and storage of hunting arms and ammunition, hunting laws and ethics, wildlife identification, wildlife management, care and handling of game, basic survival skills and first aid.

- Sixty-two courses were offered. Courses were 12-21 hours in length. A total of 2,635 students participated, 2,452 successfully completed the course; 10 failed and 169 did not complete the course. Students are asked to volunteer information on age, gender and ethnic background on their registration forms. Five hundred fifty-eight (558) students were minors (10 –14 years old); 512 were 15-17 year old minors; and 50 were minorities. Three Hundred and fifty six (356) women were identified.

Bow Hunter Education courses are designed for both the experienced and novice hunter. Course topics include the selection of equipment, safety, ethics, bow-hunting methods, and care and handling of game. Students may bring their archery equipment to class to obtain advice on its use and care. This certificate is recognized in other states where Bow Hunter Education certificates are required.

- Eighteen courses were conducted. Course length ranged from 8-12 hours. A total of 573 students participated; 572 successfully completed the course; one did not complete the course. Ninety-eight students were 10-14 years of age and 53 were 15 -17 years of age. Eight minorities and 43 women were identified.

Trapper Education is mandatory for all first-time trappers. This course includes both classroom work and field training. Students learn the proper use of traps and how to set them, the identification of fur bearing animals and their habitat, trapping laws and ethics, and landowner relations.

- Three courses were offered with a total of 152 participants. Course length was 9-12 hours; 144 students successfully completed the course. Eleven women and one minority were identified, and eighteen minors (10-17 year old) attended.

Black Powder Education covers the selection of hunting equipment, state laws, the safe handling of muzzleloaders, and powder storage. *A Certificate of Completion from the Basic Hunter Education course is a pre-requisite for all students under 18 years of age.*

- Three courses were conducted. Course length was 10 hours. Twenty-nine students participated. Twenty-seven successfully completed the course, 2 did not complete the course. Four minors 10-17 years old participated. Two women and one minority were identified.

Map, Compass & Survival Program: This one-day course includes both classroom work and field training. Topics include instruction on wilderness survival, as well as the use of a compass and topographical map for land navigation. Due to the technical nature of the course, it is not recommended for anyone under the age of 12.

- Seven courses were conducted (2 in Pittsfield, 5 in Westminster). Courses ranged from 8-10 hours in length. A total of 176 students participated; 173 passed and three were incomplete. Forty-one minors (10 -17 year olds) participated. Nine minorities and 34 women were identified.

Shooting Range Development and Enhancement

It is our objective to provide access for the public to range facilities for hunter education and shooting sports purposes by assisting shooting club range development and improvement activities. A total of $50,000.00 was made available to clubs for Shooting Range Maintenance and Enhancement projects in FY06. A total of 8 clubs responded with 17 project proposals. We funded 7 individual project proposals from 4 clubs. The selected clubs were notified of the awards and began work on the projects once all contacts and supporting documentation was finalized. Paid invoices were submitted by the clubs and reimbursed for approved costs associated with the projects. Follow-up site visits are conducted by DFW staff.

Angler Education Program

Jim Lagacy, Coordinator

The Angler Education Program is an outreach/education program within the Information and Education Section. It is the main component of the Aquatic Resource Education Program; the other component being Aquatic

Project WILD. The Angler Education Program has several components set up to introduce people to fishing and the outdoors, including Family Fishing Festivals, Basic Fresh-Water Fishing Classes, Fishing Clinics, and our own Fishing Tackle Loaner Program.

The Angler Education program is primarily volunteer-driven. Currently there are 74 established volunteer instructors in 8 workshop groups, as well as 29 Instructors-in-Training. All of them work under the oversight of the Program Coordinator on the DFW staff.

Of the 74 established instructors, 57 were active during the year. New instructors came into the program through two Instructor Training sessions, one held in Westboro, and another held at the Otter River Sportsmen's Club in Templeton. As an alternative to participation in an instructor training course, some instructors come on board by apprenticing within an existing workshop group.

Family Fishing Festivals and Derbies – There were 11 family fishing festivals for the segment. These festivals ranged in size from approximately 35 to 700 participants for a total of approximately 3110 people. These events are set up as an introduction to fishing where we make rod and reel combinations, terminal tackle and bait available at no charge, and when the manpower allows, provide basic instruction in casting, fish identification, and knot tying.

The ARE program also participated (providing volunteers and equipment on site) in five fishing derbies, including two special needs derbies (Disabled American Veterans events) serving approximately 875 participants. Total estimated participation for Festivals and Derbies for FY06 was 3,985 people.

Four-Week Basic Fresh-Water Fishing Classes – There were nine classes with approximately 155 participants. Five groups (Nashoba Valley, Newton, Pioneer Valley, Otter River, and Shrewsbury) put on these classes.

Fishing Clinics and other short programs – These programs, while short in duration, seem to be our most popular. Clinics are generally two hours in duration, involving a short lecture on the basics of beginner level angling, followed by casting instruction and a healthy dose of fishing. Also in this category: ice fishing programs, stocking programs, casting programs, and fishing educational talks (scout groups/etc.). Handouts are generally provided, and class participation is kept small enough to allow the instructors to work with participants one on one. There were 72 of these programs during the segment in various parts of our state performed by the Coordinator, and numerous volunteer instructors. A total of 2042 people (mostly children) participated.

Tackle Loaner Program – The Angler Education Program maintains fishing equipment for loan to various groups throughout the state. A total of 495 rod and reel combinations were loaned out for special events on 21 separate occasions, along with the necessary terminal tackle and various education materials. This equipment was provided to various groups/agencies including the Department of Conservation and Recreation, town Park and Recreation Departments, U.S. Army Corp. properties, USFWS, Sportsmen's clubs, and others.

Cooperative Programs – The Angler Education Program also contributed significant amounts of time to the *Massachusetts Junior Conservation Camp*, *Becoming An Outdoors-Women*, the *Massachusetts Envirothon,* and the *Massachusetts Outdoor Exposition*.

Becoming an Outdoors-Woman

Ellie Horwitz, Coordinator

Becoming an Outdoors-Woman (B.O.W.) is a program designed for women ages 18 and up. The program provides basic skills instruction to women who have expressed an interest in participating in outdoor activities and field sports. Because of cultural barriers and lack of suitable equipment, women have been, and are, under-represented among persons who enjoy and feel a commitment to the natural resources of the Commonwealth. A survey released in November 2006 by the National Sporting Goods Association documented the fact that the number of women hunting had increased by 75% between 2001 and 2005. They attribute this in large part "to programs designed to introduce females to hunting and shooting." To address this, MassWildlife offers a program coordinated by a staff member and conducted by volunteer instructors. This program provides a relaxed and comfortable venue for basic instruction in a variety of outdoor skills. Because this program is expected to be self-supporting, a good deal of the Coordinator's time is spent raising funds to underwrite the costs involved in presenting these workshops.

Over the course of FY06 ten workshops were offered as follows:

Date	Topic	Number of participants
July	Trailblazing	6
July	Lost in the Woods?	8
September	Basic Fishing (Boston)	13
October	Kayaking	9
November	Deer Hunting Seminar, Devens	7
December	Deer Hunt, Devens	17
February	Wildlife Tracking & Sign, Holden	20 (full)
April	Turkey Hunting Seminar	10
May	Turkey Hunt, Devens	10 (full)
June	B.O.W. Weekend, Lenox	75

Instruction was provided by specialists who volunteered their time and services in order to share their expertise and their passion for outdoor activities with newcomers. All sessions were evaluated by participants and productive feedback was used to enhance future programs.

In an effort to gain further insight into the interests and needs of urban women, a focus group session was

Left: A Becoming an Outdoors-Woman archery workshop.

held in Springfield in November 2005. Results of this session were reported to the DFW, International BOW, and the National Shooting Sports Foundation which had underwritten costs of the event.

Following a policy established last year, all workshop sites are reviewed for handicapped accessibility, and workshops were advertised through "All Outdoors" (a program which reaches individuals with physical disabilities.) The Program Coordinator continued to work with the Board of Project INSPIRE, a collaborative of private venture, and of the Universal Access program within the Department of Conservation and Recreation.

Conservation Camp

In August 2005 the Mass. Junior Conservation Camp held its third session at the Chesterfield Boy Scout Reservation. A total of 125 youngsters attended the program, which serves campers on a "one-time" basis. As in the past, MassWildlife staff assisted in the development of an instructional schedule, and coordinated arrangements with instructors. DFW staff and volunteers offered full Hunter Education and Bow Hunter Education courses for campers, conducted instruction in wildlife management, fisheries management and outdoor cooking skills, conducted an Information Quiz which serves as a tool to evaluate participants' learning of outdoor information and skills, and participated in the graduation ceremonies.

Other Initiatives

Environmental Police Officers' Training Academy

During this year staff members of the Section and other parts of the agency were called upon to provide instruction to Environmental Police Officers in training. Programs offered by Section staff were a day on the Hunter Education Program and a day long introduction to MassWildlife's Education Programs.

Secretary's Advisory Group on Environmental Education

(An advisory group which serves the Secretary of Environmental Affairs and the Commissioner of Education)

The Section Chief represents MassWildlife on this council and in this capacity served on a committee which revised guidelines and standards for the Massachusetts Environmental Education awards.

AFWA Conservation Education Initiative

The Section Chief participated in working group to formulate key wildlife education concepts which would be supported by all Fish and Wildlife agencies. This is part of a national initiative to develop a Conservation Education strategy applicable to all Fish and Wildlife agencies as part of a recognition of the role of education as a key tool in the management of fish and wildlife.

Agency Visibility

In an effort to increase public identification of MassWildlife staffers, T -shirts, polo shirts, dress shirts, field jackets, caps and coveralls were made available to staffers.

Information & Education Staff

Ellie Horwitz, *Chief*

Bill Byrne, *Senior Photographer*
Jill Durand, *Circulation Manager*
Suzanne Fritze, *Receptionist*
Jim Lagacy, *Coordinator, Aquatic Resources Education*
Pam Landry, *Education Coordinator*
Susan Langlois, *Coordinator, Hunter Education Program***
Marion Larson, *Outreach Coordinator*
Peter Mirick, *Publications Coordinator*

** Because of its size and importance the Hunter Education Program stands alone in the organizational structure of the agency. It is included in this report because of its functional relationship to the agency's skills programs.

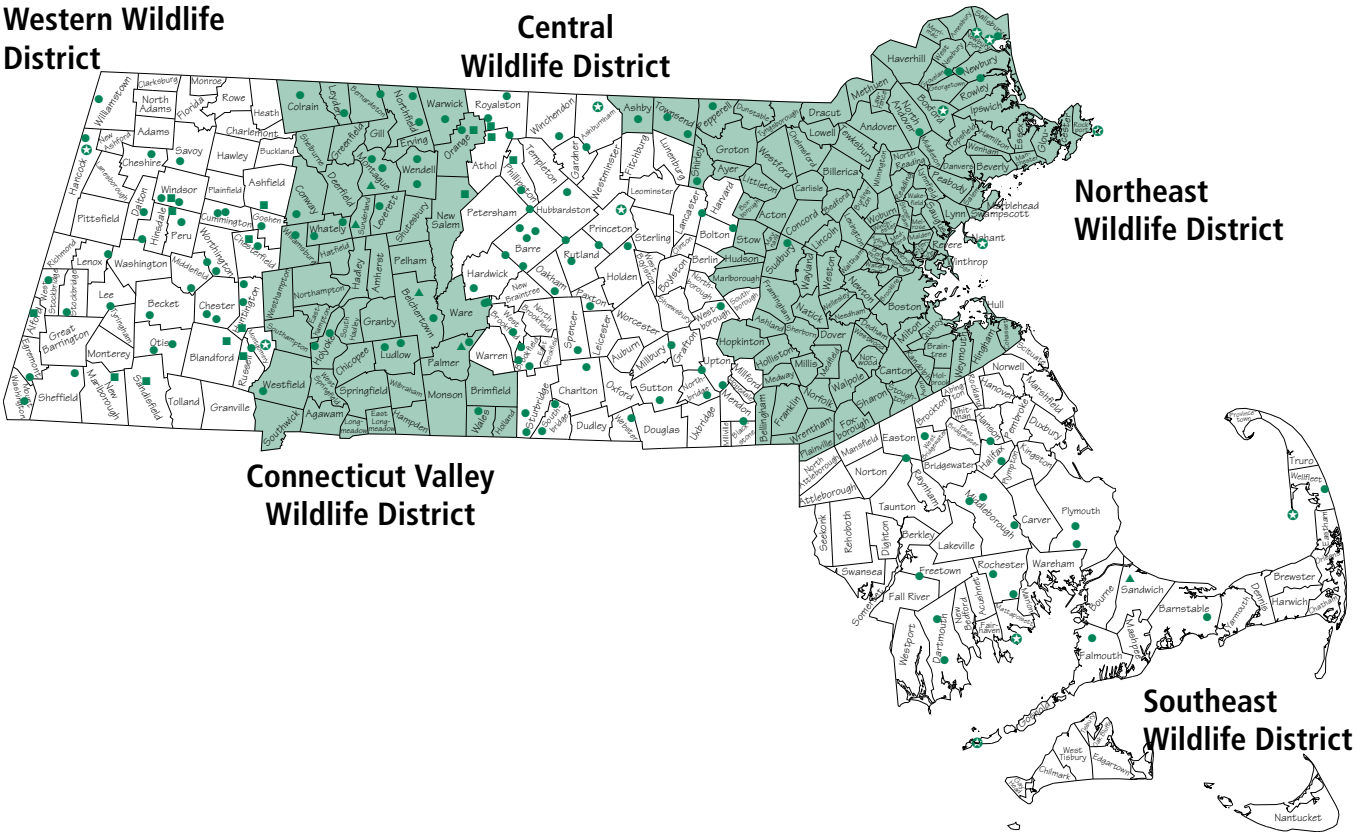
DISTRICT REPORTS

Northeast District, Patricia Huckery, *Supervisor*
Southeast District, Jason Zimmer, *Supervisor*
Central District, Bill Davis, *Supervisor*
Connecticut Valley District, Ralph Taylor, *Supervisor*
Western District, Andrew Madden, *Supervisor*

Most people who contact MassWildlife do so through one of the state's five Wildlife Districts. The District offices are MassWildlife's field stations, administering wildlife lands, conducting on-site management, enhancing recreational opportunities and addressing the wildlife issues pertinent to their individual regions. District personnel sell licenses, stamps and selected permits out of the field offices, and District staff members distribute licenses, abstracts, stamps and other materials related to the sale of hunting, fishing, and trapping licenses to vendors in their District. They assist officers from the Division of Law Enforcement to support public adherence to wildlife laws and regulations, and they assist the staff of the Wildlife Lands Section in locating titles, landowners and boundaries, and in making arrangements for the acquisition of lands for wildlife.

During the past year, staff from all of the Districts conducted administrative activities and participated in a wide variety of research programs initiated by MassWildlife's biological staff based at the Westborough Field Headquarters (see Section reports for the status of these projects.) Among the research/survey projects conducted by District staff are the annual mid-winter eagle survey; waterfowl inventory and banding/collaring; and census of wild turkey, mourning doves, woodcock, ruffed grouse and quail. District staff members also monitor the water quality of lakes and streams prior to releasing fish into them.

District staff members enhance recreational opportunities throughout the state by stocking brown, brook, rainbow and tiger trout, northern pike, tiger muskies and broodstock salmon into waters scheduled to receive them. They also release pheasants on Wildlife Management Areas (W.M.A.s) and in open covers. They monitor and maintain the Wildlife Management Areas in their region, cutting brush, mowing, trimming trails, designing forest cutting operations, planting shrubs and maintaining roads and parking areas. They emplace gates, erect signs and make other arrangements related to the protection and management of the agency's lands, buildings and vehicles. They also build and maintain nesting boxes for wood ducks, bluebirds and bats, and establish cooperative agreements with farmers raising crops on MassWildlife's lands.



District staff operate check stations where sportsmen register deer, bear, turkeys and furbearers taken during the designated hunting and trapping seasons.

District Supervisors and Managers are the agency's "point persons," spending many hours with civic and conservation groups including sportsmen's clubs and leagues, and responding to inquiries from interested citizens. They provide technical advice on wildlife matters -- particularly on the handling of nuisance animals. In this context, District staffers deal with a large volume of beaver complaints, deer damage complaints, questions about coyotes, and other issues dealing with the impact of wildlife on human activities and vice versa.

In addition to the activities that are common to all of the Districts, there are certain projects that require the participation of staff from only certain Districts.

Northeast Wildlife District

Administration and Personnel Activities

There were no personnel changes in the Northeast District during this fiscal year.

Much-needed upgrades to the District Office shop, heating system, plumbing and siding were provided and completed late in the fiscal year.

After many months of working through legal questions, the US Army Corps of Engineers, MA Division of Fisheries & Wildlife, and Fin, Fur and Feather Rod and Gun Club signed-off on the renewal of a commercial shooting permit. This permit contains some net-benefit conditions including the fact that the club will clean and maintain a new canoe launch.

The District Manager's land acquisition activities included reviewing parcels for their ecological and recreational significance, reviewing options for Natural Resource Damages dispersal from the Charles George Landfill Trust, and participating in parcel and focus area meetings led by Dennis McNamara and Lynn Harper.

The District Manager regularly attended the monthly meetings of the League of Essex County Sportsmen's Clubs, Norfolk County League of Sportsmen's Clubs, and Middlesex County League of Sportsmen's Clubs to report on wildlife and agency activity in the District.

Research and Conservation Activities

Wildlife

Waterfowl survey work was conducted in the Northeast, Central and Connecticut Valley Wildlife Districts where eight breeding plot surveys were checked, and banding was conducted from the airboat. Staff from the Northeast District assisted with the Canada goose banding project and mute swan survey.

During the winter months, biologists and technicians conducted beaver surveys within 12 quadrangles on soft ice, which made for treacherous survey conditions. These biologists provided comments during the beaver review process. The District office also served as a check station for trappers. In this capacity, Northeast District staff tagged 7 coyote, 248 beaver, 14 fisher, one gray fox, 26 otter and one mink.

Staff handled numerous calls about living with wildlife, particularly coyote, turkey, fisher, bear and deer. They helped callers understand the difference between normal behavior and problem behavior and explained techniques to help callers to protect their pets and shrubbery. Cases of interest include the excitement created over a coyote taking a small dog in Jamaica Plain, and turkey tricks in Canton and Brookline. In these cases, Division staff met with town selectmen, counselors, health officers, and conservation commissions to help them understand the behavior of these animals, to teach them how to live with these animals, and what to do about individual problem animals. A beaver colony living on the Assabet River Wildlife Refuge contributed to the partial loss of a sand dam.

Fisheries

FY06 was a productive fish survey season with one real surprise when staff discovered a flourishing native brook trout population in a stream in Natick/Framingham. Staff assessed 53 sites in 5 drainages: Parker River (8 sites – 4 brooks/rivers), Charles River (6 sites – 4 brooks), Concord River (13 sites – 11 brooks), Boston Harbor (6 sites – 4 brooks/rivers), Merrimack River (20 sites – 15 brooks/rivers). Once again, high water hampered fish sampling at the Essex Dam fish lift in Lawrence.

Westborough and Northeast District staff responded to a call from the Lawrence Police about rescuing fish trapped in a ball field during the 2006 spring flooding of the Merrimack River. Watched by cheering bystanders, staff seined the foul-smelling water, capturing about 30 carp. No native species were seen. The carp were released back into the river.

A total of 340 salmon, averaging 10 pounds each, were brought to Massachusetts from Vermont and released into local waters courtesy of the U.S. Fish & Wildlife Service. Combined spring and fall stocked trout numbered 139,915. In the fall, anglers saw 10,000 browns and rainbows released into two rivers and 18 ponds, followed in the spring by 129,915 trout in 45 ponds, five major rivers, and 68 brooks and minor rivers.

Natural Heritage& Endangered Species Program

This year the state's Mid-Winter Bald Eagle Survey along the Merrimack River was enhanced by the availability of a helicopter. Special thanks to the Massachusetts Aeronautics Commission and to pilot Dick Bunker! Airborne staff saw four bald eagles, while the ground crew saw two. Low fog hampered the Haverhill segment of the helicopter survey. This is a location which supports both over-wintering bald eagles and three eagle nesting sites

The Merrimack River bald eagle pair chose to nest in Haverhill this year, directly across from the site in West

Newbury which they had used successfully last season. Unfortunately, the chicks did not survive the 2006 spring flood, and their remains were collected from the base of the nest tree.

As an offshoot of this ongoing interest in eagles, staff participated in the 1st Annual Merrimack River Eagle Festival sponsored by the MA Audubon Society. Freezing weather did not keep the crowds away from Deer Island, where the District Manager set-up a scope where visitors saw soaring and feeding eagles, and harbor seals.

Pat Huckery, working with the U.S. Fish & Wildlife Service, helped train and supervise volunteers for vernal pool and rare species surveys at the upper Oxbow National Wildlife Refuge. One team of volunteers trapped a female Blanding's turtle that is now being tracked using radiotelemetry. Staff also conducted a vernal pool workshop at Fruitlands Museum in Harvard.

A spring survey highlight was the 10-year colonial waterbird survey led by Dr. Scott Melvin. In addition to this, staff banded peregrine falcon chicks at the Customs House, Boston, and at an abandoned mill building in Lawrence/Lowell; and they checked two piping plover breeding sites.

Throughout the year staff provided advice on environmental review projects, MESA Conservation and Management Permits, problematic vernal pool certifications, freshwater mussel survey and transplantation protocols, and ranking of rare species records. Some preliminary work was done on identifying and monitoring turtle nesting sites on Wildlife Management Areas. Limited survey work for the Threatened marbled salamander (*Ambystoma opacum*) occurred within focus areas.

Environmental Review

Staff attended meetings and provided comments throughout the year on the Devens Open Space and Recreation Plan, as well as on the Devens Disposition Plan. The District continues to work with the town of West Newbury on the upgrade of Ash Street which goes through the Crane Pond Wildlife Mgmt Area. The development of Agricultural Best Management Practices was initiated on our properties through the Natural Heritage & Endangered Species Program.

The District Manager and the Land Agent represented the DFW at management plan meetings for the Mt. Watatic Reservation which is owned jointly by the DFW, DCR and Land Trusts of Ashby and Ashburnham.

Information and Education

District Manager Huckery worked with officials in Framingham, Boxborough, and North Reading to keep these towns open to hunting. All of the towns voted to remain open. Staff members participated in Large Animal Response Training, a deer aging class and sexual harassment training. They represented the agency at such gatherings as the Carlisle Conservation Coffee hour, meetings of The Wildlife Society, MA Land Trust Conference, and MA Association of Conservation Commissioners. District Manager Huckery provided a presentation on moose to the Norfolk County League of Sportsmen's Clubs, and a training session on vernal pool amphibians to a group of Young Explorers.

Coordination, collection of materials, scheduling and booth coverage for the Topsfield Fair was handled by District personnel, with booth assistance from Westborough staff. This year staff added a beaver flow device into the exhibit to stimulate interest in beaver management.

District staff also worked at sportsmen's shows in Wilmington and Worcester.

Wildlife Management Areas (W.M.A.) and Other District Activities

As in all Districts, staff logged many hours doing the routine work of checking deer and collecting biological samples for the Chronic Wasting Disease monitoring; distributing deer tags and hunting licenses; stocking trout, salmon and pheasant; mowing roads, parking areas and trails; maintaining equipment; posting boundary signs; setting up duck blinds; picking up trash; checking public access ramps and town ramps, and investigating wildlife calls (e.g. python in Ayer).

Staff set-up and worked at special hunts for paraplegic sportsmen (Devens RFTA), a controlled waterfowl hunt (Delaney W.M.A.) and the Youth Pheasant Hunt (Martin Burns W.M.A.). They also reposted boundaries at Martin Burns W.M.A., Crane Pond W.M.A., and the Sudbury Access Area.

Ten (10) Special Pheasant Stocking Permits were issued for the Martin Burns W.M.A. for use between January 5 and March 31. Concord Rod & Gun Club conducted their first successful Youth Pheasant Hunt at Bolton Flats W.M.A. with birds provided by the Division. Ten waterfowl blinds were set up and maintained at the Delaney W.M.A.

Delaney W.M.A. – In preparation of an updated management plan, multiple surveys of the Delaney W.M.A. – located in the towns of Stow, Bolton and Harvard – were undertaken. These included a plant community assessment by Dr. Pat Swain, GPS of trails by Vin Antil, and a vernal pool survey by the Luna family. Staff worked with the Department of Conservation and Recreation on control of beaver, and with Ducks Unlimited on improving hunter access to waterfowl. An illegal bridge was removed.

Flint Pond Dam – The Division had trees removed from Flint Pond Dam, Tyngsborough, and had stonework there replaced. This was followed by the 2006 spring flood which overtopped the dam, causing DCR Dam Safety and local officials to dredge an alternate overflow. The boat ramp was damaged in the process.

Squannacook River W.M.A., Townsend, Shirley, Groton – A special thanks to the Squannatissit Chapter of

Trout Unlimited for the purchase and installation of the Brookline Street gate. We met with Townsend Police and Conservation Commission in an effort to control illegal ATV use on the property. We removed two bridges over the river, and continue to clear material illegally placed in these locations. A spectacular 40 acre parcel in Townsend was added to the W.M.A. We also met with Mrs. Rossbach concerning her farm leases.

Nissitissit River W.M.A., Pepperell – Staff spent three survey days on the river assessing the status of freshwater mussels and ATV damage.

Crane Pond W.M.A., West Newbury, Groveland, Georgetown – Staff assessed beaver influence on the system, collecting wetland community data along the way. Pheasant stocking locations were reviewed in the field with some of the local hunters.

Bill Forward W.M.A., Rowley, Newbury – Farm leases to Messrs. Colby, Herrick and Kozazcki were reviewed. Staff visited Ox Pasture Brook and a partially breached dam targeted for removal to restore smelt habitat. Smelt spawning in stream habitat below the dam was recorded by staff of the Division of Marine Fisheries.

Martin Burns W.M.A., West Newbury, Newbury – The boiler at this facility was repaired. During a routine boundary check, a significant property trespass was noted. Written notification was sent to the landowner who is claiming a 10 acre parcel of W.M.A. land as his own.

Southeast Wildlife District

Administration

In April 2006, Aaron Best was hired to fill the Wildlife Technician I position vacated by James Pinheiro, who transferred to the Western District. Two internships were completed in the Southeast District in FY06; an assessment of wastewater estrogenicity on brown bullheads in the Nemasket River by David Paulson, and a photographic inventory of the Taunton River Wildlife Management Area, which was completed by Aaron Best prior to applying for the Technician's position. Both students came from Framingham State College and were highly recommended by the faculty.

Several equipment and infrastructure improvements were completed at the District Office and at W.M.A.s, including repairs to the storage shed on the Frances A. Crane W.M.A. and repairs and improvements to the District Office storage buildings, metal and wood shops, and main office area. There were also many repairs and upgrades of equipment. New office space was added to the main office and the public portion of the office was greatly improved with new wildlife displays, additional counter space and better presentation of informational publications. These improvements have increased our effectiveness on the job and our ability to serve the public at the District Office.

The District helped organize an event held during the March Fisheries and Wildlife Board Meeting to honor former Board member, and the first Southeast District Manager, Russ Cookingham. Russ was presented with the Francis Sargent Award, along with many other awards from state and local organizations and sportmen's groups during the meeting.

Research and Conservation

Wildlife

Southeast District personnel assisted with a wide variety of wildlife-related projects throughout the year. The staff completed annual breeding surveys for ruffed grouse, northern bobwhite, woodcock, mourning dove and various waterfowl species. The staff also assisted with aerial surveys conducted by the DFW and by the US Fish and Wildlife Service. Jeff Breton, Wildlife Technician, accompanied Trina Moruzzi during aerial swan surveys in the District in August, and the District Manager assisted the USFWS during mid-winter aerial waterfowl surveys along the entire Massachusetts coastline.

The staff also assisted with an expanded Canada goose population study under the guidance of Waterfowl Biologist H Heusmann. A total of 159 Canada geese were collared and many more banded at 62 sites distributed throughout the District. The staff completed the study with a significant field observation effort later in the year to provide data that was used to estimate the statewide goose population. District personnel also constructed, monitored and maintained nesting boxes for wood ducks, Eastern bluebirds and American kestrels.

The staff traveled to the Northeast Wildlife District to assist with their annual mid-winter beaver surveys. Further, the District Manager and Wildlife Biologist responded to several confirmed reports of beavers in the Southeast District in the Towns of Marshfield, Pembroke, Hanson, Halifax and Carver, and provided information and support to the public and local officials.

The District cooperated with the Upland Habitat Program to plan a major habitat improvement project at the Frances A. Crane W.M.A. in Falmouth, which will remove invasive, exotic plant species, increase field and early-successional habitats, and improve cover for upland game birds, grassland birds and other wildlife species. Dan Fortier, Wildlife Technician, also initiated a project on the W.M.A. to seed over five acres of fields back to native grass species – including switchgrass, Indian grass and little and big bluestem – with seeds provided by the Crane Sporting Dog Association and the New England Wildflower Society.

Invasive species removal and dam mowing and maintenance were conducted at the Burrage Pond W.M.A., Rochester W.M.A., West Meadows W.M.A. and Washburn Pond W.M.A. in Fiscal Year 06. Fields, trails and parking areas were mowed, and trash removal was conducted at most W.M.A.s in the District. New signs were erected at the Church Homestead W.M.A., Agawam Mill Pond Access Area and Dartmoor Farms W.M.A.

A considerable amount of time and effort was directed towards running biological deer check stations, assisting with the collection of tissue samples from harvested deer for Chronic Wasting Disease (CWD) testing, cooperating with local officials to conduct rabies testing on sick wildlife, and tagging harvested wild turkeys and furbearers. A total of 116 deer and 26 turkeys were checked, and 32 beavers, 41 fishers, 34 river otters, 16 mink, 1 bobcat, 6 red foxes, 14 gray foxes and 82 coyotes were tagged at the District Office.

The District Manager assisted Field Headquarters staff in conducting annual inspections of all commercial deer farms in southeastern Massachusetts. Four known/permitted farms were inspected, and an additional two farms which did not have permits were found and inspected. The District also responded to, and assisted with the capture of, an illegally-released American alligator in the City of Brockton and a similar situation in the Town of Abington.

Fisheries

During the summer of 2005, fisheries surveys were completed on six ponds and the bass populations of an additional three ponds were sampled. In addition to extensive sampling of the Nemasket River for brown bullheads as part of an internship study, stream surveys were completed on 11 streams, and two new wild trout waters were located.

Temperature and dissolved oxygen profiles were conducted on 21 ponds, primarily trout ponds. The annual survey of wild brook trout in the Quashnet River with Trout Unlimited volunteers was accomplished on September 18, 2005. An additional triple pass survey to determine wild brook trout population size prior to habitat improvement activities was also completed on the Quashnet River. Stream temperatures were monitored with recording thermographs placed in the Quashnet, Mashpee, Childs, Coonamessett and Santuit Rivers. In the spring of 2006, wild brook trout were sampled from Red Brook as part of a cooperative research study, and a stream survey and five pond surveys were completed. Additional temperature sensors were placed in the Eel, Jones, Indianhead and Weir Rivers.

Three natural fish kills were reported in summer of 2005, and two natural and two man-made fish kills were reported in the winter and spring of 2006. The man-made fish kill in Carver was caused by a pond drawdown, while an extensive fish kill in the Salisbury Plain River in Brockton was the result of an ammonia spill.

Natural Heritage and Endangered Species Program

Field surveys for state-listed rare species were completed on several of our wildlife management areas including Dartmoor Farms W.M.A. in Dartmouth and the Quashnet River W.M.A. in Mashpee. District personnel identified new populations of four-toed salamanders and eastern box turtles and collected field data to certify several vernal pools on DFW lands. District staff assisted the Natural Heritage and Endangered Species program with a number of projects/issues including habitat improvements on Bird and Ram Islands; maintenance of boats and equipment for the tern project; and tern censuses and gull censuses on Bird, Ram, Penikese and Tuckernuck Islands. The staff also assisted with an environmental review on a property under development in the town of Berkley, and assisted with the release of red-bellied cooters in Lakeville and Middleborough.

District personnel visited a site near the Hockomock Swamp W.M.A. in Easton where there were reports of illegal dumping and ATV use within state-listed rare species habitat. A letter report was provided to the local and abutting landowners, town officials, the Environmental Police and NHESP in an attempt to find a solution to the significant rare species habitat damage that was observed.

Wildlife Biologist Dick Turner participated in the mid-winter American bald eagle survey. Staff also monitored the two existing and one new bald eagle nests in the District. One of the nests, located at Great Quittacus Pond in Lakeville, was relocated to a new tree by the eagle pair and was not successful this year. However, the other two nests, one located at Pocksha Pond in Lakeville and the new nest located at North Watuppa Reservoir in Fall River, were active, and both produced two healthy eaglets that were banded with the assistance of staff from the Central District. A single peregrine falcon chick was banded at the Braga Bridge in Fall River by the District Manager and Assistant Director Tom French.

Enhancement of Outdoor Recreation

The staff provided for a safe and successful pheasant and quail hunting season by stocking 8,000 pheasant and 3,500 quail on six Wildlife Management Areas and 14 open covers throughout the District. Further, 152 eight-week old pheasants were delivered to the Samoset Rod & Gun Club, a participant in the club bird program. These birds will be raised and stocked in open covers during the pheasant season. District personnel mowed and maintained hundreds of acres of fields and early successional habitats and many miles of trails on W.M.A.s to improve habitat conditions and access. The District also located and established a new quail vendor halfway through the season. The improved health and quality of released quail following this change was immediately noticed by local hunters.

The District stocked its fall 2005 allocation of 9,750 trout into 25 ponds, and stocked its spring 2006 allocation of 118,440 trout into 45 ponds and 40 streams. The District continued its close cooperation with the Sandwich State Fish Hatchery. Assistance was provided to the hatchery in computer operations and in routine hatchery operations such as trout spawning and unloading of feed. A total of 200 Atlantic salmon broodstock were stocked into Little and Long Ponds in Plymouth and Peters Pond in Sandwich on October

26, 2005. Forty Atlantic salmon broodstock from the Palmer State Fish Hatchery were stocked into Cliff and Sheep Ponds in Brewster on December 5, 2005 and an additional 110 Atlantic salmon broodstock from the White River National Fish Hatchery were stocked into Little and Long Ponds in Plymouth and Peters Pond in Sandwich on December 14, 2005. The Fisheries Manager assisted with several fishing derbies by stocking trout for the events. The District also worked closely with the Plymouth County League of Sportsmen to permit a youth fishing derby at the Burrage Pond W.M.A. during the Free Fishing Weekend in June 2006.

District staff continued to survey boundaries; remove illegally dumped trash; deter illegal ATV use; mow and maintain roads, trails and parking areas; and maintain early-successional fields and shrublands with mowing, herbicides and controlled burning on our wildlife lands and access areas to improve outdoor recreational opportunities and habitat conditions.

District staff cooperated with the Town of Hanson by donating and installing a gate to control vehicle access to their property off Crooker Place, which abuts the Burrage Pond W.M.A. The District continues to have a very positive working relationship with the Towns of Hanson and Halifax in managing public access and habitats in and around the Burrage Pond W.M.A. District staff also installed a gate and constructed a new parking area at the Dartmoor Farms W.M.A. off Division Road in Dartmouth. An event was held to honor local sportsman, environmental advocate and friend of the Division James "Lit" Kennedy by dedicating the area in his name as the James F. Kennedy Sportmen's Access.

A draft management plan was created for the Frances A. Crane W.M.A. in Falmouth to address the many habitat and public use management issues on the area. The management plan will be finalized in Fiscal Year 2007 and will serve as the guidance document for making management decisions on this property. The District also drafted written cooperative management agreements for the W.M.A.s at Myles Standish State Forest in Plymouth and Carver, and at the Freetown State Forest in Freetown, where the DFW manages the habitats and stocks pheasant and quail during the upland game bird season. The District has enjoyed an excellent management relationship with DCR staff at both sites and has cooperated in the advancement of several habitat improvement projects administered by DCR Forester Jim Rassman.

District personnel also organized and conducted controlled wild turkey and white-tailed deer hunts at Camp Edwards in Bourne and Sandwich. These hunts provide for proper management of the turkey and deer populations on the Base while concurrently providing hunters with additional recreational opportunity on Cape Cod. This effort requires the cooperation and assistance of many organizations and individuals including the staff at Camp Edwards, Cape and Islands Senior Environmental Corps, Environmental Police and the Otis Fish and Game Club. The fall deer season provided 13 days of hunting (4 archery, 6 shotgun, 3 primitive firearm) during which a total of 75 deer were harvested. The spring turkey season provided two weeks of hunting with a total of 90 hunter days of recreation provided. Four healthy male turkeys were harvested during the controlled hunt.

Technical Assistance

Technical advice and support was provided to many local Animal Control Officers, Police departments, Boards of Health and Conservation Commissions, as well as to the Environmental Police on issues dealing with fisheries, wildlife and their habitats. Many of these issues relate to the review of the potential impacts to fish and wildlife associated with proposed development projects, suburban wildlife, and conflicts with humans and other public health and safety concerns regarding fish and wildlife. The entire staff assisted with the many calls that we receive each year, particularly in the spring and early summer, pertaining to coyotes, foxes and other common suburban species. The "Living with Wildlife" publication series and/or message was provided to many individuals and organizations to assist in dealing with human-wildlife conflicts.

District staff served on various planning teams, committees and organizations and attended meetings to provide technical advice and support to the Mashpee National Wildlife Refuge Management Team, the Monomoy National Wildlife Refuge and Nomans Land National Wildlife Refuge Comprehensive Conservation Plan Teams, the Southeastern Massachusetts Bioreserve Management Team, the Assawompsett Pond Complex Management Team, and the Cape Cod Rabies Task Force.

A considerable amount of time was spent in providing technical assistance to the Air Force Center for Environmental Excellence and their contractors in relation to the Massachusetts Military Reservation (MMR) cleanup. Construction impacts on the Crane W.M.A. from the treatment systems and investigational wells were monitored, and recommendations were made for reducing impacts on flora, fauna and public use. The fisheries manager was actively involved in monitoring MMR cleanup plans as a member of the Plume Containment Team (PCT), and also served as the department representative to the Santuit Pond Preserve management team. The fisheries manager was also involved in providing technical assistance on potential stream restoration activities on town-owned cranberry bogs on the Quashnet and Coonamessett Rivers, as well as on Red Brook.

The District Manager coordinated the Division's review of Integrated Natural Resource Management Plans for various portions of Camp Edwards in Bourne and Sandwich produced by the Army National Guard Natural Resources Office. These plans guide land man-

agement and training operations on the base, which contains approximately 15,000 acres under the care and control of the Division that are open to the public for controlled wild turkey and deer hunts administered by the District Office.

Information & Education

Southeast District personnel provided outreach, education and coordination to sportsmen and the general public by attending meetings of the Barnstable, Bristol and Plymouth County Leagues. A monthly Southeast District Report was compiled by the District Manager and provided to local sportsmen at the County League meetings, made available at the District Office, and provided to and published in a monthly hunting and fishing newspaper, *New England Out-Of-Doors*. Southeast District personnel prepared and staffed displays for the Thornton Burgess Animal Day (August 10, 2005), the Marshfield Fair (Aug. 19-28, 2005), Waquoit Bay National Estuarine Research Reserve Watershed Block Party (August 2005), the Freetown State Forest Fun in the Forest Day (October 2005), the Standish Sportsmen Show (February 25-26, 2006), the Barnstable County Rabies Awareness media event and the Massachusetts Beach Buggy Association Spring Meet. The District Manager attended and served as a judge at the St. Anne's School Annual Science Fair in Dorchester.

The District staff continues to actively engage in conversations with the general public, including hunters, fishermen, hikers, bikers, dog walkers, etc. in an effort to educate them about our activities and relevant fisheries and wildlife issues. The District also continues to work closely with the Cape and Islands Senior Environment Corps to develop fisheries and wildlife projects and to engage the public in our activities. District staff puts a significant amount of effort into promoting our educational programs through the Hunter Education Program, Becoming an Outdoors Woman Program and Junior Conservation Camp through publication displays at the District Office and during presentations to local organizations.

Central Wildlife District

Administration

With funding available for the position of District Land Agent, interviews were held with six qualified candidates. An offer was extended to Brandon Kibbe of Lunenburg, who accepted the position with an anticipated start date of July 2006.

Infrastructure improvements were made to the District office including installation of new windows, heating, air conditioning, flooring, interior doors, garage doors and storage.

Research and Conservation

Wildlife

District personnel assisted in the annual midwinter Bald Eagle survey. They constructed bluebird, kestrel, and songbird nesting boxes and erected them on W.M.A.s. Radio telemetry equipment was acquired and was used for tracking deer, moose and bear. Several moose/vehicle collisions were documented and data was collected from moose carcasses which could be salvaged. Bear damage was assessed and an electric fencing unit was loaned to apiculturists to protect bee hives in Hardwick, Hubbardston and Lunenburg. A nuisance bear was destroyed by a Hubbardston resident under MGL Ch. 131, sec. 37 and the carcass was removed by District staff. A problem sow with three cubs was relocated from Route 62 in Barre to the Phillipston W.M.A. An injured moose was immobilized, treated and relocated from Old East Street in Petersham to the Phillipston W.M.A. Other moose responses were undertaken in W. Brookfield and Leominster.

Peregrine falcons nested successfully in downtown Worcester for the third consecutive year. Three chicks were banded. A new bald eagle nesting territory was identified at Wachusett Reservoir in Boylston. The pair constructed a substantial nest and they were believed to be incubating when they abandoned the site. The Quaboag Pond eagle pair built a third nest within their territory and produced three chicks which were banded. Assistance was provided to the Southeast District for eagle banding in Middleboro and Fall River. Two chicks were banded at each nest.

Common Loon nesting rafts were floated at Quabbin and Wachusett Reservoirs and a loon nesting attempt at Paradise Pond in the Leominster State Forest was again safeguarded by posting signage invoking Massachusetts General Law Chapter 131, Section 86. A nesting raft was floated at Comet Pond in Hubbardston in an effort to attract a pair of common loons. The raft was unused in 2005. The District compiled statewide loon nesting data for submission to the Heritage Program database. Blanding's Turtle traps were maintained and checked.

Fisheries

Central District staff surveyed 24 streams to assess fish populations and water quality. The District provided a shockboat and assisted biologists from DFW Field Headquarters and from the EPA with the statewide sampling of 10 lakes and ponds. Six waterbodies were sampled to determine trout survival rates during the summer months.

Angler creel surveys were conducted on Quaboag and South Ponds for the third consecutive winter. Northern pike were targeted as a follow-up to previous stockings of 16" pike as coordinated by the Spencer Fish and Game Club.

Enhancement of Recreation

District personnel oversaw the operation of 12 deer check stations, 12 turkey check stations, and one black bear check station. Ruffed grouse, American woodcock, beaver, mute swan and mourning dove censuses were completed. Canada goose census, banding, avian in-

fluenza swabs and collaring were conducted, as was an August census of collared birds. Beaver, otter, coyote, fisher, bobcat and fox pelts were tagged and recorded. Staff checked 56 established wood duck nesting boxes and checked 15 new boxes erected at various wetland sites.

A total of 12,900 ring-necked pheasants were released to Wildlife Management Areas and to open covers, and 7,000 seven week old pheasants were distributed to 12 sportsmen's clubs. Pheasants were released on 15 Wildlife Management Areas (W.M.A.s), 8 town covers and participating club properties. Bolton Flats was available for the winter pheasant hunting opportunity in Central District. Three applications for winter pheasant hunting permits were received. A review of the statewide pheasant stocking program was conducted by Westboro staff with input from the Districts.

Hatchery raised trout were released into 35 ponds and lakes as well as 23 rivers and 34 streams in Central District. Participants assisting in these relaeses included Cub Scouts, school groups, Trout Unlimited and central Massachusetts legislators.

Broodstock salmon were stocked in five ponds and lakes. These salmon came from the Roger Reed hatchery in Palmer, MA, the White River National Fish Hatchery in Bethel, VT and the Nashua National Fish Hatchery in Nashua, NH. Salmon fry were stocked in the Millers River.

Tiger muskie fingerlings donated by the state of New Jersey were released into Flint Pond in Shrewsbury. Northern pike from Pennsylvania, averaging 6 – 8 inches in length were stocked in Lake Rohunta in Athol.

Information and Education

The District Manager attended meetings and functions of the Worcester County League of Sportsman Clubs. The District Manager, biologists and technicians attended meetings with various federal, state and local agencies and private organizations including the Mass. Sportsmen's Council, Nipmuc Rod and Gun Club, Audubon Society, Fisherville Redevelopment LLC, Blackstone River National Heritage Corridor Commission, Blackstone Headwaters Coalition, the American Chestnut Foundation, Ecotarium, Sudbury Valley Trustees, MidState Trail Committee, Princeton Historical Society, Brookfield High School, Shrewsbury Recreation Dept., Wachusett Greenways, MassHighways, Northboro Trails Committee, Friends of the Upton State Forest, and Clark University. Presentations were provided to various sporting and civic organizations.

District personnel set up and helped staff the Eastern Fishing and Outdoor Exposition at the Worcester DCU Center. The Tags and Trout program was sponsored at Pratt Pond, Upton; Lake Quinsigamond, Worcester; and Mill River, Blackstone. District staff assisted with instruction of the Wildlife Management Class at the Junior Conservation Camp in Chesterfield and with the Neighborhood Nature program at Elm Park in Worcester. They also worked with a Boy Scout troop from Auburn which constructed bluebird boxes at the District as part of a merit badge program.

Other District Activities

Fourteen Wildlife Management Areas were maintained with efforts directed at roads, parking lots, gates, and providing deterrents to dumping and to ATV use. Upland Program field reclamation projects were conducted at the Winimussett, West Hill and Millers River W.M.A.s. Additional vegetation control was implemented at High Ridge and Westboro W.M.A.s. A boundary question at the Moose Hill W.M.A. was resolved and a variance granted to an abutter which required moving of a portion of a barn off the W.M.A. Discussions were initiated with snowmobile clubs and model airplane hobbyists regarding permitted uses of W.M.A.s.

The District continued its partnership with the American Chestnut Foundation through maintenance of a 300 seedling orchard located at the District office. The Foundation is seeking to develop a blight-resistant strain of American Chestnut for eventual planting in the wild. An irrigation system was installed along the rows of seedlings.

District personnel helped to evaluate an experimental on-line Basic Hunter Education course.

Public Access

The District worked with the Office of Fishing and Boating Access to move pads and other materials to boat ramps in Rutland and Chicopee. Access questions in Ashburnham, Charlton and Sturbridge were addressed.

Connecticut Valley Wildlife District

Administration

The District Manager regularly attended meetings of the Hampden County Sportsmen Council, the Hampshire County League of Sportsmen, and the Franklin County League of Sportsmen. The District Manager and the District Biologists participated in meetings with federal, state and local agencies, and land trusts, focusing primarily on land acquisition and management.

The District's Aquatic Biologist served as Past President of the Southern New England Chapter of the American Fisheries Society and also as a member of the Finance Committee of the Northeastern Division of the American Fisheries Society.

Research and Conservation

Wildlife

Valley District staff completed ruffed grouse drumming routes as assigned, assisted with the resident Canada goose survey, a mute swan survey, a woodcock census, and monitored properties in the District for the mid-winter bald eagle survey and the wild turkey brood survey.

Black Bear Project

Staff monitored the survival and reproduction of 16 radio collared bears (15 females, 1 male) during the reporting period. One yearling female bear dropped its collar. A 2 year-old female was shot as a public safety threat. The male slipped its collar and was shot during the hunting season. Eleven females were checked in their den sites during February and March to determine reproductive success and first year cub survival. Five bears had 11 newborn cubs (7M:4F). The four females expected to have a total of nine yearling cubs (4M:5F) were found to have at least seven yearling cubs which survived the first year. Two barrel traps were set east of the Connecticut River in an attempt to capture and collar female bears, but none were captured. West of the river, two traps were set and four bears (3M:1F) were captured. The female had been previously collared.

Two traps were set at an orchard in Shelburne during the first week in December to help reduce damage to beehives by nuisance bears. Twenty five bee hives were lost during the months of November and December despite an electric fence setup. One sub-adult male was captured, ear-tagged, and released 40 miles south of Shelburne. After this bear was captured, the damage stopped, most likely due to the trapping and winter weather conditions.

Moose Project

Staff monitored two radio-collared moose (1 bull, 1 cow) during the reporting period. They also captured and radio-collared a bull in an urban area, and relocated it to a remote forested area

Waterfowl banding

Staff banded 90 geese at eight sites and assisted agency biologists in the airboat duck-banding program.

Wood Duck Program

Staff maintained 180 wood duck nesting boxes at 48 sites. Bluebird and kestrel nesting boxes were maintained at several Wildlife Management Areas.

Natural Heritage and Endangered Species Projects

Eagles

The Valley District continues to monitor all breeding territories and band all eaglets at the Quabbin Reservoir and west to the New York border that are located in trees that can safely be climbed. Staff checked 12 eagle nests and banded 23 eagle chicks. The District Biologist assisted in the aerial portion of the mid-winter eagle survey at the Quabbin Reservoir and the Connecticut River.

Peregrines

Staff banded two peregrine chicks at the University of Massachusetts Library in Amherst.

Loons

Three loon rafts were maintained at the Quabbin Reservoir.

Water Quality Monitoring

District staff conducted stream surveys in the Deerfield River basin in conjunction with the Department of Environmental Protection (DEP) and with projects originating at Field Headquarters.

Enhancement of Recreation

Staff stocked 10,000 pheasants on 45 town covers and 10 Wildlife Management Area covers during the six week pheasant hunting season. In addition to the birds released to Wildlife Management areas and to open covers, District staff distributed 1,544 seven-week-old pheasants to six sportsmen clubs within the District that participated in the Club Pheasant Rearing Program.

During the fall, District staff administered a controlled waterfowl hunt at the Ludlow W.M.A. Eight hunters applied and participated in the hunt.

Staff stocked 131,000 rainbow, brook and brown trout in the fall of 2005 and spring 2006. They also stocked 200+ surplus broodstock Atlantic salmon, dividing them among Lake Mattawa (Orange), Lake Metacomet (Belchertown), Fivemile Pond (Springfield) and Lake Congamond (Southwick)

Fisheries staff conducted stream surveys in the Connecticut River basin (summer and fall, 2005). They stocked fish for several fishing festivals in the Valley District, including the Fivemile Pond Festival (Springfield), Forest Lake Derby (Palmer), Heritage Pond Derby (E. Longmeadow), Lake Nashawannuck Derby (Easthampton) and the USFWS Open House (Hadley);

Lands Management

Existing signs and access were maintained at all Wildlife Management Areas in the Valley District. All or portions of boundaries were marked at East Mountain W.M.A., Honeypot Road W.M.A., Green River W.M.A., Satan's Kingdom W.M.A., Catamount W.M.A., Herman Covey W.M.A., Facing Rock W.M.A., Palmer W.M.A., and Williamsburg W.M.A. In a special and massive maintenance effort, staff gathered up 10 yards of household trash that had been dumped illegally over one weekend at the Herm Covey W.M.A. Dumped items, including appliances and furniture, were collected and disposed of as quickly as possible to discourage further illegal dumping. The area around the house on River Road was fenced to discourage trespassing, although this remains an ongoing problem.

Technical Assistance

District Staff provided technical support, manpower and repair capability for the McLaughlin Trout Hatchery, Westboro Field Headquarters, and District equipment as requested.

Information & Education

District staffers took a leading role in representing the agency at both the Franklin County Fair and the Springfield Sportsmen's Show. In preparation for the Franklin County Fair, staffers gathered fish from local

waters for display at the fair; updated display materials, and spent four days working the MDFW booth where they met the public and responded to all manner of questions relating to wildlife.

As in all Districts, the District Manager and staff provided numerous programs to clubs, civic and community groups.

Western Wildlife District

Administration

Significant personnel changes occurred in the Western District during FY06. Joseph Kirvin (Wildlife Technician II) retired after 23 years of service. Nancy Dewkett (Wildlife Technician I) was promoted to fill the Wildlife Technician II position vacated by Jerry Shampang in FY 05. Tammy Ciesla was hired as a Wildlife Technician II in January 2006 to the position vacated by Joe Kirvin. James Pinhiero transferred from the Southeast Wildlife District into the Wildlife Technician I position vacated when Nancy Dewkett was promoted.

Western District Supervisor Tom Keefe passed away in December 2005. Tom had over thirty years of dedicated service to the agency. His knowledge and skill was of great value to the Division of Fisheries and Wildlife. He will be missed by sportsmen, conservationists, and agency personnel throughout the state. Andrew Madden, Western District Aquatic Biologist, served as Acting District Manager from December to January, and was promoted to District Manager in February 2006.

Research and Conservation

District staff participated in ongoing research programs such as goose banding, eagle banding, and nest box monitoring and construction. The wildlife biologist and technicians serviced, repaired and established wood duck boxes throughout the District. They also constructed and installed nest boxes for kestrels and bluebirds. The wildlife biologist and technicians conducted breeding bird censuses for woodcock, grouse and mourning dove. District staff also identified and recorded 2 eagles during in the mid-winter eagle survey.

District personnel continued to monitor movement of radio collared deer and moose. The Wildlife Biologist participated in the Hy Fox Breeding Bird census for the 21st consecutive year, assisted the Natural Heritage Program in finding and documenting spring salamander locations, and attended the annual New England Plant Conservation Program (NEPCOP) meeting. District staff, under the guidance of the wildlife biologist and furbearer biologist, conducted beaver surveys throughout southern Berkshire County.

The aquatic biologist and staff conducted fish surveys on numerous streams and rivers throughout the District. They also deployed and collected data from thermographs distributed to monitor temperature in headwater streams and larger rivers. The aquatic biologist, with the assistance of the wildlife biologist and technicians, investigated multiple fish kills and a report of the presence of grass carp.

District staff assisted in salmon fry stocking in the Westfield and Deerfield Rivers.

The District Supervisor participated in development of a proposed ACEC stewardship plan.

He and the District's wildlife biologist also participated in large animal response training.

The aquatic biologist represented the Division at Eastern Brook Trout Joint Venture (EBTJV) meetings in Virginia and West Virginia and contributed written sections to the EBTJV Conservation Strategy. The aquatic biologist developed and submitted grant proposals for aquatic habitat restoration and recreational fish enhancement.

Enhancement of Recreation

District staff successfully carried out duties associated with recreational fishing and hunting. Both spring and fall trout were stocked on schedule. Pheasants were stocked in Wildlife Management Areas (W.M.A.s) and local covers, and check stations for turkey, deer, and bear were run efficiently and professionally.

The District wildlife technicians managed vegetation on eight W.M.A.s under the guidance of the wildlife biologist and field headquarters staff. These efforts occur annually with significant personnel effort, but great benefit to the resource and recreation. District staff posted miles of property boundaries on both new acquisitions and existing lands.

Both the aquatic biologist and wildlife technicians participated in salmon and esocid stocking. This required travel to Vermont, Pennsylvania and New York to pick up fish and deliver them to Massachusetts for recreational anglers to enjoy.

Technical Assistance

The District clerk fielded hundreds of calls asking for technical assistance. District staff, particularly the clerk, wildlife biologist and aquatic biologist, answered these inquiries with professionalism and expertise. The clerk also handled high volumes of walk-in traffic and issued permits and licenses to hundreds of sportsmen. In addition to advising the public at large, District staff members were often called upon to provide technical assistance to other agencies or user groups. The District Supervisor and aquatic biologist devoted considerable time to issues surrounding the cleanup of the Housatonic River. The aquatic biologist attended Citizens' Coordinating Committee (CCC) meetings as a Division representative to the cleanup efforts. Significant time was spent reviewing documents and proposals on the subject. The aquatic biologist also helped in sampling efforts related to the cleanup and served as a review team member for Housatonic NRD fund proposals.

The aquatic biologist provided technical expertise to other agencies such as USFWS, DCR, NRCS and the Riverways program.

The wildlife biologist fielded many calls regarding black bear issues. He provided technical advice to individuals over the phone and met with the public on several occasions to provide site specific recommendations.

Information & Education

The wildlife biologist presented information to school groups and to the Berkshire Humane Society camp. He also conducted an introduction to birding workshop at the DFW's Becoming an Outdoorswoman (BOW) annual summer workshop. The aquatic biologist represented the agency at the LAPA-West conference and was a guest on the Gun Owners Action League (GOAL) television show. He also provided presentations for cub scouts and for the Huntington Grange. The District supervisor, aquatic biologist and wildlife biologist represented the agency at Berkshire County and Hampshire County league meetings.

District staff represented the agency at the Springfield Sportsman's Show and the Hoosic River State of the River conference. Wildlife technicians Tammy Cielsa and James Pinhiero conducted a class on Reading Animal Sign at the BOW summer workshop. District staff members also participated in mentoring programs such as job shadowing and career days.

District Personnel

Northeast District

Patricia Huckery, *District Manager*
Dennis McNamara, *Land Agent*
Erik Amati, *Wildlife Biologist*
John Sheedy, *Aquatic Biologist*
Bob Desrosiers, *Wildlife Technician*
Michael Huguenin, *Wildlife Technician*
Rachel Nichols, *Wildlife Technician*
Steve Wright, *Wildlife Technician*
Sue Ostertag, *Clerk*

Southeast District

Jason E. Zimmer, *District Supervisor*
Steve Hurley, *Fisheries Manager*
Dick Turner, *Wildlife Manager*
Ed Kraus, *Wildlife Technician*
Jeff Breton, *Wildlife Technician*
Daniel Fortier, *Wildlife Technician*
Aaron Best, *Wildlife Technician*
Camie Marsh, *Clerk*
Joan Pierce, *Land Agent*

Connecticut Valley District

Ralph Taylor, *District Supervisor*
David Fuller, *Wildlife Manager*
David Basler, *Fisheries Manager*
Barbara Bourque, *Clerk*
Gary Galas, *Wildlife Technician*
Kevin Peloski, *Wildlife Technician*
Walter Tynan, *Wildlife Technician*
James Wright, *Wildlife Technician*
Will Steinmetz, *Land Agent*

Central District

Bill Davis, *District Manager*
Mark Brideau, *Fisheries Biologist*
Bob Chapin, *Technician*
Paul Leboeuf, *Technician*
Priscilla MacAdams, *Clerk*
Bridgett McAlice, *Wildlife Biologist*
Scott Kemp, *Technician*
Michael Morelly, *Technician*
Land Agent, *Vacant*

Western District

Andrew Madden, *District Supervisor*
Anthony Gola, *Wildlife Manager*
Dana Ohman, *Fisheries Manager* *(Started 11/06)*
Nancy Dewkett, *Wildlife Technician*
Dale Beals, *Wildlife Technician*
Jim Pinheiro, *Wildlife Technician* *(Trans. from SE 1/06)*
Tammy Ciesla, *Wildlife Technician* *(Started 1/06)*
Elna Castonguay, *Clerk*
Peter Milanesi, *Land Aquisition Agent*

WILDLIFE LANDS

William J. Minior
Chief of Wildlife Lands

FY06 was a very frustrating year for land acquisition. Many landowners were reluctant to commit themselves to a conveyance, and those who did waited until late in the FY resulting in a year end crunch. Nearly two-thirds of the 30 acquisitions were recorded after June 1st. Four to eight projects were completed per district for a reasonable geographical distribution.

Acquisitions varied in size from a 0.1 acre access on Spectacle Pond in Wareham to the 826 acre Old Sturbridge Village CR/CE in Sturbridge. Eight projects in excess of one hundred acres were completed in FY06, including five in excess of two hundred acres and two in excess of three hundred acres. Although most of our land protection efforts resulted in fee acquisitions, the five Conservation Easements completed in FY06 accounted for over one-third of total acreage protected.

Non-profit environmental organizations again provided valuable assistance to our land protection program. The Egremont Land Trust acquired a resource-rich parcel along the Green River in Egremont and subsequently conveyed a CR/CE to DFW at a fraction of the market value. The Valley Land Fund gifted two borrow pits totaling 40 acres along Route I-91 in Whately, and also conveyed a 156 acre forested tract in Bernardston and Leyden which is now the Keets Brook W.M.A. Mount Grace Land Conservation Trust pre-acquired and conveyed a highly developable 30 acre key inholding within our Orange W.M.A., while the East Quabbin Land Trust conveyed the 125 acre Moose Brook Wildlife Conservation Easement for DFW's previous efforts and commitment on a land protection project in Barre and Hardwick. Other nonprofit and municipal assistance statewide has proven invaluable to our acquisition efforts.

Five projects were submitted and approved for federal aid and are expected to result in nearly three million dollars of reimbursement to our Inland Fish and Game Fund. These projects were the 212 acre Stillman addition to the Burrage Pond W.M.A. in Hanson and Halifax, the Old Sturbridge Village CR on 826 acres in Sturbridge, the 49 acre Bellerman addition to the Squannacook River W.M.A. in Townsend, and two relatively small Salisbury Marsh projects.

Although the FY06 land protection effort seemed to progress rather slowly, a strong finish resulted in 30 acquisitions completed at a total cost of approximately eight million dollars. DFW currently has care and control of over 160,000 acres statewide.

Activity in FY06

Western District	
Expended	$850,000.00
Acreage	435.0
Cost/acre	$1,954.02
Valley District	
Expended	$ 864,000.00
Acreage	554.3
Cost/acre	$1,558.72
Central District	
Expended	$2,863,000.00
Acreage	1,181.6
Cost/acre	$2,422.99
Northeast District	
Expended	$1,090,950.00
Acreage	114.6
Cost/acre	$9,519.63
Southeast District	
Expended	$2,531,800.00
Acreage	612.0
Cost/acre	$4,136.93
Total Expended:	**$8,199,750.00**
Total Acreage Acquired:	**2896.9**
Average Cost Per Acre:	**$2,830.53**

The above figures include departmental acquisitions. It should be noted that the acreage figures and costs of those properties acquired with FY06 funds and RECORDED for FY06 between 8/5/05 and 7/06 are included herein. Ancillary costs are not included.

Western District

Eight acquisitions were completed in the Western District, protecting habitat and providing recreational opportunity in seven towns and on seven different DFW areas. The 201 acre Ernest Smith purchase was the largest district acquisition, and it, along with another 75 acre purchase, added significantly to the Hiram H. Fox W.M.A. Relatively small additions were also made to the Hawley Natural Heritage Area, Eugene Moran W.M.A., Mount Tekoa W.M.A., and Chalet W.M.A. An 18 acre Westfield River access parcel was acquired in Chester with extensive frontage on Route 20 and on the Westfield River. The Egremont Land Trust purchased the fee interest in a 21.5 acre Green River parcel in Egremont and proceeded to convey a CR/CE to DFW. This parcel has extensive river frontage, excellent resources and provides outstanding recreational opportunity.

Approximately 435 acres were protected in the district in FY06 at a cost of about .85 million dollars. Although quite successful overall, from a project development perspective, FY06 was a very difficult year in this district as several projects did not materialize as expected.

Valley District

The Connecticut Valley District successfully completed eight acquisitions protecting over 500 acres of land in ten towns. This represented two new areas and additions to five existing W.M.A.s. The new areas include the 40 acre Whately Ponds Fish & Wildlife Area gifted by the Valley Land Fund, Inc. and the 156 acre Shattuck Brook W.M.A. in Bernardston and Leyden purchased from VLF, Inc. The Whately Ponds consist of two borrow pits created during the construction of I-91 and they provide a significant warm water fishery. Shattuck Brook is a 15-20' wide coldwater stream along the northern boundary of the W.M.A. The W.M.A. is primarily rugged, mixed hardwood terrain.

Mount Grace Land Conservation Trust, Inc. pre-acquired and then conveyed a 30 acre inholding within the Orange W.M.A. This tract is primarily field with extensive road frontage and would certainly have been developed for residences with distinct negative impacts on our area.

Other acquisitions included a 207 acre addition that more than doubled the size of the Warwick W.M.A., a multi-parcel 84 acre addition to the Montague W.M.A., and relatively small ahdditions to the Coy Hill and Poland Brook W.M.A.s. The district expended approximately .86 million dollars protecting 554 acres in their FY06 land protection effort.

Central District

Five acquisitions in the Central District, one courtesy of the Valley District, protected nearly 1,200 acres in FY06. Eight hundred and twenty six (826) acres of the Old Sturbridge Village property were protected in a cooperative effort with the Town of Sturbridge. DFW acquired a CR/CE on the subject property and the town acquired the fee interest. DFW will call this new area the Leadmine Mountain WCE. The East Quabbin Land Trust, Inc. conveyed a CR/CE on an approximate 125 acre tract in Hardwick which is now our Moose Brook WCE. This CE was conveyed to DFW for DFW's involvement in the acquisition of a key 212 acre parcel located in Hardwick and Barre in June of 2004.

The West Brookfield portion of the Coy Hill W.M.A. was enlarged by 105 acres through a Valley District acquisition, and approximately 50 acres were added to the Bolton Flats W.M.A. primarily for rare and endangered resources and an effort to link this W.M.A. with the military's Fort Devens property. A seventy five acre addition to the Phillipston W.M.A. will be utilized as match to hopefully leverage approximately three million dollars in funding for the Forest Legacy's Quabbin Corridor Project. Although only five acquisitions were completed, the Central District protected 1,182 acres at a cost of 2.86 million dollars.

Northeast District

The Northeast District continues to be the most costly and difficult area in which to protect open space. It is the most populated part of the state and land parcels are generally relatively small in size and high in cost. The district completed four acquisitions protecting approximately 115 acres at a cost of about $9,500 per acre. The largest acquisition was a 49 acre addition to the Squannacook River W.M.A. which contains valuable rare and endangered resources and approximately 3,000 feet of river frontage. Two acquisitions added 54 acres to the Salisbury Marsh W.M.A., increasing this valuable coastal resource to 522 acres. A cooperative effort between the Town of Pepperell and the DFW protected a key 12 acres along Sucker Brook in the Town of Pepperell. This tract is sandwiched between two larger parcels already protected as open space by the town. Considerable groundwork was conducted in FY06 to enhance our future land protection efforts.

Southeast District

Southeast FY06 land projects covered a broad spectrum in size and cost, ranging in size from the 0.1 acre Spectacle Pond access to the 337 acre King's Point parcel (Freetown Swamp W.M.A.), and in cost from the $1,500 Hockomock Swamp addition in West Bridgewater to the $2,000,000 Stillman addition to the Burrage Pond W.M.A. Of the seven SE acquisitions, the Stillman acquisition is perhaps most notable for several reasons. This 212 acre gem is split fairly evenly between the towns of Hanson and Halifax, and has nearly two miles of common boundary with the existing Burrage Pond W.M.A. This tract contains a variety of habitat types including 65 acres of ponds, 50 acres of scattered red maple swamp, 65 acres of wooded upland and 21 acres of active cranberry bog with associated open upland. This property was acquired subject to a cranberry lease that was negotiated with DFW assistance prior to conveyance by the 90+ year old grantor. A nearby 9.7 acre parcel was also added to this W.M.A. during this fiscal year.

Other notable acquisitions are the 337 acre King's Point parcel in Freetown, a large wetland area which includes extensive shrub swamp and Atlantic White Cedar swamp, as well as a cranberry bog reservoir. Forty eight acres of primarily wooded wetland were added to the Haskell Swamp W.M.A. and a cooperative effort between the Town of Wellfleet, the Wellfleet Conservation Trust and DFW protected an extremely valuable 4.6 acre coastal parcel. The SE District had a successful acquisition year protecting 612 acres at a cost of 2.53 million dollars.

Land Agents

Peter Milanesi, *Western District*
Bill Steinmetz, *Connecticut Valley District*
Brandon Kibbe, *Central District*
Dennis McNamara, *Northeast District*
Joan Pierce, *Southeast District*

Western District

Wildlife Management Areas: 29	**Acres**	**Tract #**
Agawam Lake	779.8	254
Becket	239.6	60
Chalet	7,080.3	86
Cummington	194.0	240
Day Mountain	332.4	264
Eugene Moran	1,573.0	91
Farmington River	1,760.3	211
Fisk Meadows	1120.8	88
Fox Den	4,419.1	100
Green River	489.2	125
Hancock	204.0	123
Hinsdale Flats	1,544.5	89
Hiram H. Fox (formerly Canada Hill)	3,360.5	48
Hop Brook	424.8	112
Housatonic Valley	817.9	67
John J. Kelly	267.0	85
Jug End*	1,233.8	191
Knightville	721.0	244
Lilly Pond	349.7	255
Maple Hill	345.1	148
Mount Tekoa	1,422.0	231
Otis	83.5	124
Peru (Includes Tracy Pond)	5,106.9	30 & 113
Powell Brook	224.0	115
Savoy	1,282.8	64
Stafford Hill	1,591.6	56
Taconic Mountain	157.3	232
Three Mile Pond	1,095.5	181
Walnut Hill	812.0	190
	39,036.6 acres	

*Jointly owned and managed with DCR

Wildlife Conservation Easements: 11		
Alford Spring	640.0	269-1
Ashfield	101.0	247-1
Blanford	986.0	249-1,2&3
Chesterfield	491.0	248-1&2
Dalton Fire District	2,754.0	253-1
Huntington	78.0	250-1
Mount Plantain	1,337.4	241
New Marlborough	239.0	246-1
Sandisfield	692.0	245-1,2&3
Tyringham	678.0	252-1
Wright/Mica Mill	1782.0	243
	9,735.4	

River Access: 5		
Green River(Egremont)	21.5	292
Hoosic River	5.9	213
Housatonic River	129.5	103
Konkopot River	8.8	114
Westfield River (W)	391.0	94
	556.7	

Wildlife Sanctuaries: 2		
E. Howe Forbush	268.0	16
Grace A. Robson	69.5	24
	337.5 acres	

Wildlife District: 1		
District Headquarters	2.1	13

Natural Heritage Areas: 8		
Bullock Ledge	15.5	212
Dolomite Ledges	198.3	227
Fairfield Brook	203.3	226
Hawley	169.0	277
Jug End Fen	38.8	147
Kampoosa Fen	72.0	173
Lanesboro	88.6	233
Nordeen Marsh	22.9	102
	808.4	

TOTAL WESTERN DISTRICT 50,476.7 acres

VALLEY DISTRICT

Wildlife Management Areas: 28	**Acres**	**Tract #**
Catamount	413.0	119
Coy Hill(V)	211.6	221
East Mountain	347.9	202
Facing Rock	1,556.1	179
Herman Covey**	1,475.1	49
Honey Pot/Westfield	227.0	174
Lake Warner	94.8	180
Leadmine(V)	344.0	170
Leyden	359.0	200
Millers River(V)	65.84	A62
Montague	1,533.8	118
Montague Plains	1,493.0	234
Mount Toby	262.5	222
Orange	1,564.2	229
Palmer	1,045.3	178
Pauchaug Brook*	161.3	74
Poland Brook	645.7	70
Satan's Kingdom	1,867.9	107
Shattuck Brook	156.1	293
Southampton	130.9	262
Tully Mountain	1,187.4	225
Tully River(V)	59.0	272
Wales	207.1	172
Warwick	379.0	126
Wendell	585.7	144
Whately	360.6	182
Whately Great Swamp	369.5	235
Williamsburg	88.0	127

*W.M.A. and Connecticut River Access

**Combination-Hatchery(McLaughlin), W.M.A. and District Hdqtrs.

Wildlife Conservation Easements: 3		
Amherst/Pelham ALA	36.9	274
Ludlow Reservoir	1750.0	271
North Quabbin CRs		257
New Salem	59.0	
Tully River	250.0	
	2,095.9	

Islands (Connecticut River): 2		
Shepherd's Island	15.0	80
Sunderland Islands (2)	9.0	189
	24.0	

Fish Hatcheries: 4		
Bitzer	150.6	7
McLaughlin(inc.in Herman Covey W.M.A.)		
Reed	301.0	8
Sunderland	47.7	9
	499.3	

Game Farm: 1

Wilbraham*	137.2	4

*Turned over to Town in 99. CR retained on 137.2 acres.

River Access: 9

Connecticut River	82.3	117
Deerfield River	20.5	201
Green River(V)	58.2	185
Mill River	23.0	239
Sawmill River	51.0	176
Sibley Brook	13.4	152
Tully Brook	77.0	177
Ware River(V)	14.0	A63
Westfield River(V)	76.8	111
	416.2	

Pond Access: 3

Little Alum Pond	0.5	128
Lake Lorraine (PAB)	0.3	129
Lake Rohunta	2.5	209
	3.3	

Fisheries & Wildlife Areas: 1

Whately Ponds	40.0	294

Natural Heritage Areas: 5

Rainbow Beach	30.9	142
Mt. Toby Highlands NHA	100.0	159
Mt. Tom	72.7	238
Darwin Scott Memorial	27.3	157
Honey Pot NHA	184.1	175
	415.0	

TOTAL VALLEY DISTRICT **20,822.3 acres**

CENTRAL DISTRICT

Wildlife Management Areas: 41	**Acres**	**Tract #**
Ashby	48.5	134
Bennett	281.2	A77
Birch Hill	3,753.0	50
Bolton Flats	1,177.9	90
Breakneck Brook	1,409.0	158
Coy Hill***	654.2	221
E. Kent Swift	200.5	84
Fish Brook	221.0	130
Four Chimneys	200.0	77
High Ridge*	2,326.8	98
Lackey Pond	150.5	165
Lawrence Brook	947.5	108
Leadmine(C)	296.0	170
Martha B. Deering	181.6	237
McKinstry Brook	348.3	184
Merrill Pond (System)	729.0	10
Millers River(C)	3,453.1	62
Mine Brook	780.5	258
Moose Brook	495.3	132
Moose Hill	567.1	59
Muddy Brook	1183.0	167
North Brookfield	80.0	278
Oakham	707.6	153
Palmer***	208.0	178
Phillipston	3,486.3	31
Popple Camp	1,161.0	A31
Poutwater Pond (formerly North Street)	378.0	133
Prince River	749.0	113
Quaboag River	1,677.4	55
Quacumquasit	179.9	131
Quisset	507.1	196
Raccoon Hill	628.0	151
Richardson	467.2	106
Savage Hill	1,109.7	150
Thayer Pond	131.0	171
Tully Mountain	119.5	225
Tully River(C)	9.0	272
Ware River(C)	291.4	63
Westboro****	894.6	35
Winimusett	651.1	61
Wolf Swamp	913.9	217
	33,753.6 acres	

*Management and control under DFW 1,673.7 acres
DFW owned in fee 282.0 ac

*** Listed and managed under Conn. Valley District

**** 467 acres added from a 97 DCAM transfer

Wildlife Conservation Easements: 9

Burnshirt River	5.64	160
Carter Pond	280.0	155
Hunting Hills	53.7	183
Leadmine Mountain	826.0	295
Moose Brook	125.0	296
North Quabbin CRs		257
Phillipston (Secret Lake)	212.0	
Tully River	6.6	
Quabbin	28.0	161
Stillwater River	29.0	162
	1,565.9	

Wildlife Sanctuaries: 2

Susan B. Minns	140.0	20
Watatic Mountain	100.0	25
	240.0	

River Access Areas: 5

Blackstone/West River	28.0	76
Five Mile River (includes 17 ac CR)	195.5	120
Natty Brook	95.2	220
Quinapoxet River	32.0	66
Seven Mile River	77.0	275
	427.7 acres	

Natural Heritage Areas: 4

Chockalog Swamp	52.5	286
Clinton Bluff NHA	42.0	154
Podunk Marsh	15.0	104
Quag Pond Bog	31.0	197
	140.5	

Marshes: 1

Quinsigamond Marsh	59.0	156

Pond Access: 6

Cusky Pond	23.75	163
Fisherville Pond	1.6	166
Glen Echo Lake	1.0	149
Mossy Pond	16.1	267
South Meadow Pond	0.25	266
Sputtermill Pond	58.5	164
	101.2	

Forest: 2

Hamilton	70.0	75
Northboro	88.8	51
	158.8	

TOTAL CENTRAL DISTRICT **36,446.7 acres**

NORTHEAST DISTRICT

Wildlife Management Areas: 11	**Acres**	**Tract #**
Ashby	1,020.0	134
Crane Pond	2,235.6	38
Dunstable Brook	131.6	283
Hunting Hills*	356.4	183
Martin H. Burns	1,554.5	37
Mulpus Brook	177.7	203
Nissitissit River	364.9	71
Pantry Brook	410.9	29
Salisbury Marsh	522.1	279
Squannacook River**	1,112.4	53
William Forward	2,122.5	36&82
	10,008.6	

*Includes 53.7 acre CR in CD
** 21 acres title vested in DEM

Wildlife Conservation Easement (WCE): 3		
Ashby	148.0	280
Groton	127.0	289
Pepperell Springs	255.0	285
	530.0	

Wildlife Sanctuaries: 5		
Carr Island	110.5	18
Egg Rock	2.0	17
J.C. Phillips	391.0	15
Milk Island	29.0	19
Ram Island	20.0	23
	552.5	

Game Farm: 1		
Ayer	96.9	1

Wildlife District: 1		
District Headquarters	1.9	11

Fisheries & Wildlife Area: 1		
Flint Pond	81.9	28

Forest: 2		
Acton	36.0	207
Townsend	60.0	33
	96.0	

Pond Access: 4		
Knops Pond	0.6	52
Mascopic Lake	0.3	65
Baddacook Pond	0.2	A52
Long Sought For Pond	1.0	143
	2.1	

Salt Marsh: 1		
North Shore	335.65	47 & 58

River Access: 7		
Concord River	23.6	97
Ipswich River	1.8	204
Nashua River	68.5	110
Sucker Brook	12.0	297
Sudbury River*	139.1	121
Trapfall Brook	45.4	109
Weymouth Back River**	16.4	135
	306.8	

Natural Heritage Areas: 4		
Boxboro Station	25.5	188
Eagle Island	5.0	199
Elbow Meadow	132.8	101
Hauk Swamp	55.0	206
	218.3	

TOTAL NORTHEAST DISTRICT 12,230.6 acres

*Held jointly with D.E.M.
**Departmental acquisition

SOUTHEAST DISTRICT

Wildlife Management Areas: 20	**Acres**	**Tract #**
Burrage Pond	1,859.7	265
Copicut	3,762.1	141
Church Homestead	163.0	287
Dartmoor Farms	473.0	236
Erwin Wilder	450.0	A83
Frances A. Crane	1,912.8	27
Freetown Swamp	337.0	298
Gosnold	3.5	96
Haskell Swamp	2,866.5	218
Hockomock Swamp	4,454.5	83
Hyannis Ponds *	357.0	187
Meetinghouse Swamp	109.0	214
Noquochoke	204.6	208
Peterson Swamp	250.0	81
Purchade Brook	120.0	215
Red Brook	400.0	260
Rochester	70.0	57
Rocky Gutter	3,054.7	68
Taunton River	179.0	219
West Meadows	221.9	34
	21,248.3	

Wildlife Conservation Easements: 5		
Acushnet River	30.2	263
Angeline Brook	50.7	273
Camp Cachalot	789.0	223
Plymouth Pine Hills	188.0	288
Santuit Pond	293.0	268
	1,350.9	

Wildlife Sanctuaries: 4		
Billingsgate Island	0.5	14
Penikese Island	60.0	21
Ram Island	2.0	22
Tarpaulin Cove	4.5	93
	67.0	

Wildlife District: 1		
District Headquarters	23.8	12

Fish Hatcheries: 1		
Sandwich	60.0	5

Game Farm: 1		
Sandwich	133.0	3

Salt Marsh: 6		
Brayton Point	2.2	169
Chase Garden Creek	56.4	205
Eastham	7.4	136
English	191.5	146
Fox Island	87.1	192
South Shore	22.4	69
	367.0	

River Access: 7		
Bread & Cheese Brook	5.2	291
Canoe River	116.6	282
Childs River	0.2	193
Mashpee River	56.5	78
Nemasket River	0.5	122
Quashnet River**	426.0	32
Taunton River	8.9	219
	613.9	

* NHESP priority area-Departmental taking
** 360 acres of Quashnet held jointly with DEM

Pond/Coastal Access: 13		
Agawam Mill Pond	1.7	216
Bakers Pond	1.7	79
Bearse Pond	5.8	72
Clapps Pond	68.4	87
Cooks Pond	3.0	73
Dogfish Bar Beach (PAB)	2.4	210
Lake Snipatuit	0.5	92
Robbins Pond	1.0	284
Sandy Point	0.2	54
Scorton Creek	5.5	228
Spectacle Pond	0.4	224
Triangle Pond	81.9	256
Wakeby Pond	15.9	242
	188.4	

Military Lands: 7		
Dillingham Lot	37.0	
Fisk Forestdale Lot	117.0	46
Hog Pond Lot	26.2	42
Lawrence Pond lot	10.0	43
Mashpee Pond Lot	25.0	40
Poponesset Beach	2.0	41
Springhill Lot	7.0	44
	224.2	

Hatchery Land: 1		
No. Attleboro Hatchery	36.5	99

MA Military Reservation (MMR)	15,000.0	281

Fisheries & Wildlife Area: 3		
Muddy Pond	72.0	95
Provincetown Rte.6 Corridor	122.0	276
South Barrier Beach(Leland)	99.5	194
	293.5	

Natural Heritage Areas: 11		
Grassy Pond	59.4	168
Grassy Pond (Dennis)	7.2	230
Harlow/Cooks Pond	51.9	145
Head of the Plains	2.0	138
Katama Plains *	18.5	140
Mashpee Pine Barrens	193.2	105
Miacomet Heath	3.8	186
Olivers Pond	12.0	139
Sly Pond	192.0	137
South Triangle Pond	10.3	198
Thad Ellis	1.5	195
	556.7	

TOTAL SOUTHEAST DISTRICT 40,162.7 acres

Total Acreage Area by Area Type
(Through FY06)

Wildlife Management Areas: 127	121,238.5 acres
Wildlife Sanctuaries: 13	1,197.0
Fish Hatcheries: 5	559.3
Game Farms: 3	367.1
River Access: 33	2,321.3
Salt Marsh: 7	702.7
Lake, Pond & Coastal Access: 26	295.4
Fisheries & Wildlife Areas: 5	415.4
NHESP Areas: 32	2,138.9
Conservation Restriction: 31 (Some CRs are included in W.M.A.s)	15,278.1
MA Military Reservation: 1	15,000.0
Other*	626.3
GRAND TOTAL	160,139.6

**Includes: Military Lands, Forest Areas, Wildlife Districts, Islands, Hatchery Land, MDC/F&W Areas and Marsh Management Areas.*
Above figures include departmental acquisitions.

Cow moose NEEDS A CAPTION!!!

FEDERAL AID PROGRAM

Kristin McCarthy
Federal Aid Coordinator

Project Objectives: To implement the Division of Fisheries and Wildlife's (DFW) Federal Aid program, acting through the Deputy Director, including overview of documentation, reporting, compliance with acts and regulations, and other requirements for administration of federal grants; and serving as liaison between the grantee and the Region 5 office of the U.S. Fish and Wildlife Service (FWS), grant administrator for the U.S. Department of the Interior.

Federal Aid in Wildlife Restoration (Pittman-Robertson)

The Massachusetts Division of Fisheries and Wildlife (DFW) apportionment of Federal Aid in Wildlife Restoration funds ($2,208,601) was a decrease from last year's apportionment. These funds are available for wildlife restoration projects and hunter education. Six projects were reimbursed with these funds including hunter education, wildlife population trends and harvest surveys, waterfowl research and management, wildlife habitat management, program coordination, and land acquisition.

Federal Aid in Sport Fish Restoration (Dingell-Johnson and Wallop-Breaux)

The State's Federal Aid in Sport Fish Restoration Act apportionment of $2,908,477 represents a decrease over last year's apportionment. These funds were divided as follows: The Department of Fish and Game Public Access Board (PAB), which is responsible for constructing and maintaining motorboat access facilities received $ 436,271.55 (15%) and the balance of $2,472,205.45 was equally divided ($ 1,236,102.72 each) between the Division of Marine Fisheries and the Division of Fisheries and Wildlife (DFW). Nine grants were reimbursed with the PAB and DFW share of the D-J and W-B funds. The Public Access Board in cooperation with DFW had five boat accommodations grants active in FY06. The Division of Fisheries and Wildlife had four projects reimbursed under the Sport Fish Restoration Program. The DFW's fish restoration activities include aquatic resources education, program coordination, hatchery operations, hatchery maintenance, fish distribution, and anadromous Fish Coordination and Technical Assistance.

State Wildlife Grant Program (SWG)

The Division of Fisheries and Wildlife's FY06 State Wildlife Grant apportionment of $919,222.00 was an increase from the previous year. SWG funds were obligated toward five projects. Activities reimbursed under SWG funds include fish community research, anadromous fish restoration, biodiversity impact review, biodiversity inventory and research, biodiversity conservation mapping and planning, habitat evaluation, and land acquisitions. SWG funds were also used in the development of our Comprehensive Wildlife Conservation Strategy (CWCS). In order to establish eligibility for continued SWG funding, the DFW must develop a CWCS and submit it to the USFWS by October 1, 2005. Our commitment to develop this CWCS under SWG was submitted and approved on April 10, 2002.

The Draft Massachusetts Comprehensive Wildlife Conservation Strategy (CWCS) was submitted on time to the National Acceptance Advisory Team (NAAT). It was conditionally approved by the NAAT and identified as one of the top 12 such plans in the nation by the Defenders of Wildlife. Needed changes to the CWCS identified by the NAAT are being made and the document will be resubmitted in the late summer of 2006 for their final approval.

The Endangered Species Act (Section 6)

The Division of Fisheries and Wildlife continues to receive minimal Endangered Species Section 6 funding. Our entire FY06 apportionment of $27,600.00 was used to reimburse a portion of the Piping Plover recovery project.

Landowner Incentive Program (L.I.P)

In April 2006, the Division of Fisheries and Wildlife submitted an application under the FY06 US Fish and Wildlife Service competitive Landowner Incentive Program to receive additional L.I.P funding. At the time of this report, the USFWS had not announced the FY06 awards. In FY05, the Division received a combined award of $655,000.00 under the competitive Land Owner Incentive Program; a $425,000 decrease when compared to previous awards. The FY05 award was divided into two Tiers. Our FY05 Tier I funding of $180,000.00 will be used for project coordination. The remaining balance of $475,000.00 (Tier II) will be used to implement the Land Owner Incentive Program. For more information relating to DFW's FY06 activities under the Land Owner Incentive Program (please see the Landowner Incentive Program report, page 27).

Chronic Wasting Disease Surveillance and Management

In FY04, through a grant provided by the US Department of Agriculture, Animal and Plant Health Inspection

Service, the Division was able to establish our Chronic Wasting Disease Surveillance and Management Program. The FY06 CWD apportionment of $90,000.00 represents an increase over the FY05 apportionment of $53,571.00. The CWD funds are only used to fund the Division's CWD Surveillance and Management Program. For more information relating to DFW's FY06 activities under the Chronic Wasting Disease Surveillance and Management Program please see the Wildlife Section annual report.

Avian Influenza Surveillance and Monitoring

In May 2006, the Division was notified that it was eligible to apply for $40,000 in federal assistance through the US Department of Agriculture, Animal and Plant Health Inspection Service for Avian Influenza monitoring. The funding will be used in June of 2006 and in FY07 to conduct statewide Avian Influenza surveillance efforts. For more information relating to Avian Influenza surveillance efforts please see the Wildlife Section annual report.

Audits

In FY05, the US Department of Interior, Office of the Inspector General (OIG) completed a federal audit of all Sport Fish and Wildlife Restoration grants administered by the Division for fiscal years 2003 and 2004. These federal audits are conducted once every five years. The OIG completed their field review in May of 2005 and the exit conference was held on May 24, 2005. The OIG audit report was issued on October 3, 2005 and the Corrective Action Plan was developed and approved by the US Fish and Wildlife Service in January 2006.

In July 2005, representatives from the U.S. Department of Interior and the US Fish and Wildlife Service Diversity and Civil Rights Department conducted a Civil Rights Audit of the Division of Fisheries and Wildlife. These Civil Rights Audits are conducted periodically by the Department of Interior to monitor agencies' (participating in federal assistance programs) compliance with various Civil Rights Acts. The final audit report was issued in February 2006. The Division is currently working on implementing the recommendations.

Other Matters

Additional Federal Aid Coordinator's duties include responding to requests for information, public inquiries, DFW inventory management, overview of projects performance and financial reporting, project assistance (both field and office), field visits, and to serve as the liaison between U.S. Fish and Wildlife Federal Aid personnel and the DFW.

Project Personnel

Kristin McCarthy, *Federal Aid Coordinator*

Jessica Lane, *Assistant to Federal Aid Coordinator*
Debbie McGrath, *Federal Aid Bookkeeper*
John O'Leary, *Grants Specialist and CWCS Development Coordinator*
Ken MacKenzie, *Landowner Incentive Program Coordinator*

MAINTENANCE & DEVELOPMENT

Gary Zima
Senior Planner

This was an exciting year for Maintenance and Development programs. As in the past, projects were undertaken to meet basic agency needs, but FY06 was exceptional in that we were able to make a large number of infrastructure improvements thanks to a special year-end allocation. This funding enabled the Division of Fisheries & Wildlife to make numerous badly needed improvements to the Richard Cronin Field Headquarters complex in Westborough. Visitors to the Field Headquarters are now greeted with 240 feet of new concrete sidewalk. All of the building's interior walls and trim were repainted, and the entire building was re-carpeted. Perhaps most important of all in terms of energy conservation, the working conditions of our employees and the comfort of the visiting public was the replacement of the building's 84 old windows with modern, highly efficient, insulated models that have virtually eliminated the drafts and heat leakage which have plagued this facility for many years.

The recent improvements also brought the Field Headquarters Building into compliance with the Americans with Disabilities Act (ADA). These improvements included the creation of a handicap accessible bathroom, installation of two handicap accessible entry doors, and the addition of a handicap accessible lift (outdoor, enclosed elevator). To facilitate access to the lift, the agency repaved a back parking lot designated for ADA parking and installed appropriate signage.

Heating systems at the Field Headquarters were also upgraded. A new oil heater was installed in the maintenance shop (Building D) and 30 feet of steam pipe were replaced in the Headquarters Building (Building A)

A crane installing Building C at Westborough Field Headquarters.

Safety/health upgrades, including installation of carbon monoxide and smoke detector alarms (Building A) brought the Division into compliance with state fire codes. Accumulated hazardous materials were removed, a complete inspection (including a diagnostic video and maintenance report) of the building's (Building A) sewage line was conducted, and the line was cleaned.

In addition to refurbishing the existing facility, the Division expanded the amount of office space available with the addition of a new double-wide modular office trailer (Building C). This building is fully furnished with tables, chairs and work stations. A new, climate controlled trailer (Building E) was emplaced and outfitted with shelving to house the Division's publications and stationery supplies.

Equipment purchased for the agency during the year included five replacement aluminum fish transport tanks for Districts and Hatcheries. The walk-in freezer unit adjacent to the Field Headquarters was also replaced, as was the garage door to the Wildlife bay.

In terms of rolling stock, the Division was able to replace only one large vehicle. This large truck, a heavy duty 2007 Freightliner diesel flatbed, went to the Connecticut Valley Wildlife District, where it will be used to transport fish and also serve to transport the Division bulldozer to and from work sites across the state.

Administrative Staff

Gary Zima, *Senior Planner*

Debbie McGrath,
Administrative Assistant and Clerical Supervisor

LEGISLATIVE REPORT

Jack Buckley
Deputy Director & Legislative Liaison

Chapter 137 of the Acts of 2005

AN ACT RELATIVE TO A LOADED SHOTGUN OR RIFLE

Approved November 22, 2005

Summary:

This act clarifies the definition of a loaded shotgun or rifle, and particularly clarifies the definition relative to a muzzleloader.

For complete text of this legislation view the Acts of 2005, Chapter 137.

PERSONNEL REPORT

Peter Burke
Personnel Officer

New Hires

Permanent

Name	Title	Date	Comments
Karen Candora	Receiving Teller I	07/05/05	
Samuel Schneski	Game Biologist I	07/17/05	
Debra Manty	Clerk III	08/16/05	
Bruce Walker	Wildlife Technician II	08/21/05	
Colleen Olfenbuttel	Game Biologist III	09/01/05	
Gregory McSharry	Wildlife Technician I	10/30/05	
Tammy Ciesla	Wildlife Technician II	01/08/06	
Aaron Best	Wildlife Technician I	04/03/06	
Pamela Quigley	Receiving Teller I	04/03/06	

Contractt

Name	Title	Date	Comments
Misty-Anne Marold	Scientist	07/05/05	
Nicole Hamilton-Smith	Researcher	07/10/05	
Lisa Plagge	Researcher	08/16/05	
Rebecca Skowron	Researcher	08/16/05	
Amy Goodestine	Researcher	08/16/05	
Renee Ericksen	Researcher	08/16/05	
Julia Richburg	Planner	08/16/05	
Claire Corcoran	Planner	09/18/05	Rehire
Lori Erb	Scientist	11/14/05	
Michael Kashiwagi	Scientist	11/28/05	
Alice Norris	Researcher	12/28/05	
Sarah Haggerty	Scientist	12/11/05	
Deborah Stevens	Program Coordinator	01/08/06	
Michael Dumont	Contract	04/10/06	
Jessi Manty	Contract	04/10/06	
Jacob Morris/Siegel	Contract	04/10/06	
Luke Baroni	Contract	05/01/06	
Erin Money	Contract	04/24/06	
Christopher Uraneck	Contarct	04/24/06	
Emily Pollum	Scientist	05/08/06	
Amanda Breon	Scientist	05/08/06	
Rachel Cherow	Scientist	05/08/06	
Katherine Blake	Student Intern	05/08/06	
Lee Ripma	Student Intern	05/08/06	
Caroline Causey	Scientist	05/08/06	
Mary Davis	Scientist	05/08/06	
Matthew Purvis	Scientist	05/08/06	

Promotions

Permanent

Name	Title	Date	Comments
Jessica Patalano	Program Coord. to Cons. Biologist I	09/01/05	from contract position
Nancy Lamb	Wildlife Tech. I to Wildlife Tech. II	11/28/05	
Andrew Madden	Aquatic Biologist I to Dist. Fish & Game Super.	12/11/05	
William Musiak	Wildlife Tech. I to Wildlife Tech. II	04/30/06	

Contract

Name	Title	Date	Comments
Rebecca Skowron	Researcher to Researcher	06/02/06	Contract

Continues, next page

***Personnel**, continued from page 63.*

Transfers

Permanent

Name	Title	Date	Comments
Rick Kennedy	EDP Systems Analyst III	8/25/2005	
James Pinheiro	Wildlife Technician I	1/17/2006	SE Dist. to Western Dist.

Reallocations

Name	Title	Date	Comments
Julia Delaney	Administrative Asst. II to Program Coor. I	01/01/06	1 Grade Increase
Yunus Khalifa	Admin. Services Coordinator to Prog. Coord. II	01/17/06	2 Grade Increase
James Hahn	Fish Culturist II to Fish Culturist III	01/01/06	2 Grade Increase

Terminations

Permanent

Name	Title	Date	Comments
Joseph Kirvin	Wildlife Technician II	07/15/05	
Karen Candora	Receiving Teller	12/06/05	
Thomas Keefe	District Fish and Game Supervisor	12/09/05	Deceased
Lesley Chadwick	Wildlife Technician II	03/03/06	
Eric Jefts	Wildlife Technician I	04/30/06	
Samuel Schneski	Game Biologist I	06/22/06	

Contractors

Name	Title	Date	Comments
Luke T. Baroni	Contract	07/15/05	
Jesse R. Burrill	Contract	07/15/05	
Brendan D. Cardoza	Contract	07/15/05	
Adam Doucette	Student Intern	08/13/05	
Joshua M. Buzzell	Scientist	09/02/05	
Jenny R. Cunningham	Scientist	09/02/05	
Rachel F. Henderson	Scientist	09/02/05	
Joy M. Kuter	Scientist	09/02/05	
Sara Luecke	Scientist	09/02/05	
Melanie Sabourin	Scientist	09/02/05	
Adam H. Crook	Contract	09/30/05	
Michael W.V. Dumont	Contract	09/30/05	
Maurice C. O'Connor	Contract	09/30/05	
Nancy Putnam	Scientist	09/30/05	
Renee Ericson	Researcher	12/29/05	
Amy Goodestine	Researcher	02/17/06	
Joanne Theriault	Researcher	04/01/06	
Christopher Uraneck	Contract	06/09/06	
Leslie Bol	Scientist	06/30/06	
Julia Richburg	Planner	06/30/06	

Work Hour Changes

Name	Title	Date	Comments
Elna Castonguay	Clerk III	7/24/2005	
Elna Castonguay	Clerk III	10/31/2005\	

Leave of Absence

Contract

Name	Title	Date	Comments
Julie Richburg	Planner	1/2/2006 to 4/10/2006	maternity contract not renewed

FINANCIAL REPORT

Administrative Staff

Patricia Sheppard,
Assistant Director of Administration and Finance, Chief Fiscal Officer

Procurement and Payables

Yunus Khalifa, *Purchasing Coordinator*
Kerry Meagher, *Contract Coordinator*
Gail Gibson
Lillian Hew
Betty Sienczyk

Revenue

Robert Oliver, *Revenue Coordinator*
Mary Cavaliere
Carl Lui
Helen Yung

Permits

Robert Arini

Information Technology

Rick Kennedy
Robert Morley

How the Sportsmen's Dollar Was Spent

Inland Fish and Game Fund

July 1, 2005 to June 30, 2006

PROGRAMS/ASSESSMENTS	EXPENDITURES	PERCENTAGES
Administration:		
Administration	$1,527,564.32	
Information-Education	$563,523.66	17%
Total	**$2,091,087.98**	
Fisheries and Wildlife Programs:		
Hatcheries	$1,401,164.90	
Game Farm	$398,214.48	
Seasonals	$59,425.78	52%
Cooperative Units	$99,211.75	
Fisheries and Wildlife Management	$4,271,728.14	
Total	**$6,229,745.05**	
Other Programs:		
Land Acquisitions	$1,749,950.00	
Waterfowl Management Program	$40,357.80	18%
Hunter Safety Program	$405,678.34	
Total	**$2,195,986.14**	
Other Assessments:		
Group Insurance and Other Fringe Benefits	$1,502,247.00	12%
Total	**$1,502,247.00**	
TOTAL EXPENDITURES	**$12,019,066.17**	

Summary
Revenues, Expenditures and Fund Equity
Natural Heritage & Endangered Species Fund
July 1, 2005 to June 30, 2006

REVENUES	
Natural Heritage and Endangered Species Tax Checkoff Donations	$228,404.38
Sales	$33,041.00
Federal Aid Reimbursements	$866,956.46
Massachusetts Endangered Species Act Fees	$268,839.70
Contracts	$18,000.00
Direct Donations	$2,852.00
Interest	$5,243.07
TOTAL REVENUES:	***$1,423,336.61***
EXPENDITURES	
*Natural Heritage and Endangered Species Program	$683,517.36
Fringe Benefit Costs	$122,000.00
TOTAL EXPENDITURES:	***$805,517.36***
TOTAL FUND EQUITY:	***$770,075.01***

*100% of total expenditures charged to Natural Heritage Fund for FY06

Other Funds and Programs
Expenditures Division Wide
July 1, 2005 to June 30, 2006

TRUST FUNDS:	
Tern Restoration Trust	$153,863.61
TOTAL EXPENDITURES	***$153,863.61***
CAPITAL OUTLAY FUNDS:	
Land Protection	$28,500.00
Statewide Turtle Protection Plan	$99,725.41
Heritage Mapping for Biodiversity	$321,600.75
Forest Certification	$180,065.77
Upland Habitat Management	$174,358.65
Staffing for Land and Infrastructure Programs	$634,331.31
Hunter Education Facility Repairs	$45,798.50
Hatchery Facility Repairs	$242,376.34
District/Westborough Field Headquarters Repairs	$568,253.69
TOTAL EXPENDITURES	***$2,295,010.42***

Summary
Revenue and Fund Equity
Inland Fish and Game Fund
July 1, 2005 to June 30, 2006

DEPARTMENTAL REVENUES:	
Fishing,Hunting, and Trapping Licenses	$4,880,691.76
Archery Stamps	$134,354.40
Primitive Firearm Stamps	$149,384.10
Trap Registrations	$905.00
Waterfowl Stamps, Administration	$10,357.80
Waterfowl Stamps, Ducks Unlimited	$10,357.80
Waterfowl Stamps, Other	$31,073.40
Wildlands Stamps	$934,130.00
Antlerless Deer Permits	$195,495.90
Bear Permits	$26,827.50
Turkey Permits	$72,717.50
Special Licenses,Tags and Posters	$46,301.50
Magazine Subscriptions	$88,778.07
Sales,Other	$8,561.25
Fines and Penalties	$22,252.50
Rents	$43,658.65
Prior Year Refunds	
Miscellaneous Income	$446.55
PAC	$3,304.00
NSF Charge/Debt. Collection	$524.00
Total	**$6,660,121.68**
FEDERAL AID REIMBURSEMENTS:	
Dingell-Johnson (Fisheries)	$1,122,050.80
Pittman-Robertson (Wildlife)	$1,596,851.63
Indirect Cost Reimbursements	$898,127.12
Total	**$3,617,029.55**
TAXES:	
Gasoline Tax Apportionment	$885,716.06
OTHER FINANCIAL SOURCES:	
Reimbursement for Half-Price Licenses	$128,911.25
Investment Earnings	$37,663.07
Total	**$166,574.32**
TOTAL REVENUE	***$11,329,441.61***
FUND EQUITY AS OF JUNE 30, 2006	**$11,730,320.14**

License and Stamp Sales

July 1, 2005 to June 30, 2006

Type of License	Unit Cost	Quantity	Amount
Resident Citizen Fishing	22.50	110,085	2,476,912.50
Resident Citizen Minor Fishing	6.50	5,516	35,854.00
Resident Citizen Fishing (Age 65-69)	11.25	4,413	49,646.25
Resident Cit. Fishing (Over 70, etc.)	FREE	12,105	0.00
Non-Res. Citizen/Alien Fishing	32.50	7,198	233,935.00
Non-Res. Citizen/Alien Fishing (3 day)	18.50	1,804	33,374.00
Resident Fishing (3 day)	7.50	847	6,352.50
Non-Resident (Citizen) Minor Fishing	8.50	267	2,269.50
Duplicate Fishing	2.50	415	1,037.50
Quabbin 1-Day Fishing	5.00	1,882	9,410.00
Resident Citizen Trapping	30.50	221	6,740.50
Resident Citizen Minor Trapping	6.50	9	58.50
Resident Citizen Trapping (Age 65-69)	15.25	25	381.25
Duplicate Trapping	2.50	8	20.00
Trap Registration	5.00	181	905.00
Resident Citizen Hunting	22.50	19,109	429,952.50
Resident Citizen Hunting (Age 65-69)	11.25	784	8,820.00
Resident Citizen Hunting (Paraplegics)	FREE	285	0.00
Resident Alien Hunting	22.50	92	2,070.00
Non-Res. Cit./Alien Hunting (Big Game)	94.50	2,182	206,199.00
Non-Res. Cit./Alien Hunting (Sm. Game)	60.50	839	50,759.50
Resident (Citizen) Minor Hunting	6.50	1,189	7,728.50
Duplicate Hunting	2.50	299	747.50
Resident Citizen Sporting	40.00	31,763	1,270,520.00
Resident Citizen Sporting (Age 65-69)	20.00	2,223	44,460.00
Resident Citizen Sporting (Over 70)	FREE	9,158	0.00
Duplicate Sporting	2.50	558	1,395.00
TOTAL LICENSE SALES (GROSS)		***213,457***	***4,879,548.50***
Type of Stamp			
Archery Stamps	5.10	26,344	134,354.40
Primitive Firearm Stamps	5.10	29,291	149,384.10
Wildlands Stamps	5.00	175,639	878,195.00
Non-Resident Wildlands Stamps	5.00	12,040	60,200.00
Waterfowl Stamps, Administration	5.00	5,948	29,742.00
Waterfowl Stamps, Ducks Unlimited	5.00	1,983	9,915.00
Waterfowl Stamps, Other	5.00	1,983	9,915.00
TOTAL STAMP SALES (GROSS)		***253,228***	***1,271,705.50***
Fees Retained by Clerks			(28,379.00)
Refunds			(401.00)
TOTAL			**(28,780.00)**
TOTAL LICENSE/STAMP SALES (NET)			***6,122,474.00***

APPENDIX I
FISHERIES SURVEY & INVENTORY PROTOCOL

Statewide Survey and Inventory Procedures

1. Introduction

Even for its relatively small size, Massachusetts has a wealth of aquatic resources. Previous aquatic survey projects have identified 2,027 named streams and 2,878 lakes, ponds, and impoundments within the Commonwealth's borders. There are a total of 28 named river basins ranging in size from the Shawsheen River basin, with only 77 square miles of drainage area in Massachusetts, to the Chicopee River basin, covering more than 721 square miles within Massachusetts.

The extensive and diverse fishery resources found in the Commonwealth are of enormous recreational and economic benefit. They provide employment, tourism, and wholesome, family-oriented recreational opportunities for hundreds of thousands of people and contribute millions of dollars to the state's economy. It is in the best interest of the Commonwealth to secure these benefits by protecting and restoring healthy fish populations and enhancing fishing opportunities. This initiative is imperative if we are to protect and restore fisheries habitat and to enhance access for fisheries uses for present and future generations.

The Division of Fisheries and Wildlife (DFW) is responsible for the protection, perpetuation, restoration, and management of Massachusetts' fauna and flora. Conservation of aquatic resources, including the fish, wildlife, and associated habitats is crucial if the DFW is to meet the terms of its mandate.

The simple presence of substantial aquatic habitat does not imply environmental health and integrity. According to Naiman et al. (1995), "over the past 50 to 200 years, the freshwaters of the United States have undergone the most significant transformation they have experienced in nearly 10,000 years." Virtually all watersheds, except some small headwater catchments, have been modified and degraded by human development (Williams et al. 1997).

The Environmental Protection Agency (EPA) estimates that of waters surveyed, only 60% of river miles, 55% of lake acres, and 61% of estuary mileage designated for aquatic life support, fully support such use. Nationwide, 70 to 90% of all natural riparian habitats have been extensively altered nationwide and over 80% of stream fish communities are adversely affected by environmental degradation (Judy et. al 1984). Some of the major causes of alteration are reduced flow (affecting 40% of perennial streams), siltation, bank erosion, and channelization (affecting 41% of perennial streams). Lastly, a conservative estimate of 2.6 million lake-acres are impaired by material carried by inflowing tributaries. This wide spread disturbance has lead to a loss of watershed products and function such as high quality water and productive soils. These products and functions are important for moderation of flood and drought conditions and maintenance of diverse plant and animal communities (Williams et al. , 1997).

Massachusetts, specifically, has suffered severe habitat alteration. Information from the Massachusetts Department of Environmental Protection (DEP) has determined that only 3% of assessed river miles and 4% of assessed lake acres fully support aquatic life as dictated by the language of the Clean Water Act. Loss of fish habitat has caused significant declines in fish populations and access to fishing opportunities throughout the Commonwealth. Channelization, eutrophication, installation of flood-control structures, erosion, sedimentation, excessive water flow diversion and consumption, destruction or modification of wetlands, and other physical impacts have degraded fish habitat. The degradation in Massachusetts has not been uniformly distributed. Urban Communities are disproportionately affected by aquatic habitat loss, loss of species diversity, invasion of exotic species, and lack of public access to waterways and fishing opportunities. Fish populations are often impacted by alteration and poor land and water use practices.

Information available on the condition of our waterways will allow society a better understanding of the consequences of extensive land and water use. This understanding translates into simple terms: goods, services, and values associated with terrestrial environments come from healthy watersheds. Increased public awareness leads to several immediate changes in the way we treat watersheds. These changes range from legislative - a willingness to accept more environmentally friendly regulations, to simple practices – like the use of native plants in restoration efforts (Williams et al., 1997). This better understanding will allow us to focus stakeholder efforts on initiatives that will protect the best remaining habitat and restore habitat that has been degraded. The key to implementing the Fisheries Section initiative is to fully involve watershed teams and volunteers that will form the backbone of the manpower and have a vested, localized interest in the resource. The products of the Fisheries Section Initiative will be, in part, the

identification of specific watershed restoration projects. Watershed teams will then have a voice in determining which projects are implemented. It is important for the Fisheries Section to work with watershed teams in a systematic, cooperative, and supportive fashion to ensure watershed restoration.

According to Williams et al. (1989), one third of North American fresh water fish species qualify for threatened, endangered, or some other sensitive status. Survey and inventory procedures developed by the Fisheries Section are designed to monitor resources and are crucial to the conservation of these aquatic resources. Recognizing the watershed-scale environment and the effects of disturbance to aquatic habitat are the first steps in restoration (Sean 1994 – from Williams et al., 1997). The proposed initiative is one designed to develop a community-based watershed restoration program that compliments the existing regulatory framework. The Division of Fisheries and Wildlife can protect and restore fisheries habitats through a watershed-based program by forming partnerships with local and regional stakeholders on a watershed by watershed basis.

The objectives for the Fisheries Section's Initiative are to focus resources on a watershed basis to:

1. assess the current status of fisheries resources;
2. create a comprehensive fisheries database;
3. develop watershed-based fisheries management plans;
4. conduct environmental review and assessment;
5. identify watershed lands that need to be protected as open space for protection and restoration of fisheries habitat and public access;
6. identify factors and activities causing adverse impacts to fisheries habitats and uses;
7. provide technical assistance and biological data to government agencies and private organizations involved in watershed management and protection; and
8. identify potential fisheries and habitat restoration projects for volunteers and watershed participant action plans.

The Statewide Watershed Initiative presents an opportunity to expand a model for data collection, database management, and watershed-based fisheries management planning that is being successfully implemented by the Fisheries Section state-wide. This project is designed to contribute to a watershed model that will incorporate hydrologic monitoring and habitat assessment in fisheries-based watershed management plan that will improve the health and integrity of the basin.

2. Methods

The methodologies used for the Statewide Watershed Plan are designed to provide historical and current information that will enable the Fisheries Section to accomplish the goals stated above.

2.1 Historical Information

An assessment of historical information will allow the Fisheries Section to identify information gaps and set sampling priorities. Background research will consist of three basic tasks. First, information will be gathered from a wide variety of historical sources. Second, this information will have to be interpreted to determine its validity and applicability. Finally, it will be computerized and referenced to be comparable to data collected during the course of the project.

Background information on each watershed will be located and consolidated from several sources. Fisheries Section field headquarters files contain the majority of all recent Fisheries Section-related sampling efforts and will be the initial source of historical data. The field headquarters files will be supplemented with information from our five district offices. Other potential source of information (Environmental Impact Reports, Diagnostic Feasibility Studies, etc.) will also be located and referenced

Historical Information will then be reviewed by biologists and managers to determine the extent to which it can be employed in the current assessment methodologies. Validation of sampling methodologies and species identification will be clarified and incorporated into metadata to document its validity. Databases will then be designed or modified to incorporate historical information where possible.

2.2 Fishery Assessment

The objective of the fishery assessment is to gather information about fish species diversity, relative abundance and length frequency distribution. Backpack, barge, and boat-operated electrofishing units will be the primary sampling mechanisms. Backpack shockers are best used in small shallow streams and are designed for headwater reaches. Barge electroshockers are designed to be used in wadeable streams with depth or current flow that make backpack shockers inefficient. Boat shockers will be used in lakes and rivers that are too deep to wade and where more power output is required.

Sampling locations will be selected based on available access, water conditions and habitat type. Fish sampling crews will conduct site visits to rivers and lakes to determine suitable access locations and sampling sites. Lotic habitat types (riffle, run, pool, etc.) and lentic habitat types (eutrophic, mesotrophic, oligotrophic) will be sub-sampled in proportion to their availability as determined by site visits. Data collection will take place from May 15 to September 15.

2.2.1 Stream and River Sampling

Crews of three to five people will conduct single pass electrofishing surveys through previously selected sites. The beginning and ending points will be marked on USGS 1:25,000 topographical maps. Sample sites will be include at least 100 meters of stream length. In situations where100 meter reaches are not practical or

possible, length of stream sampled will be measured by tape.

Crews will begin at the downstream end of a sampling site and shock to the upstream ending point. Crewmembers will use dipnets to capture fish that roll off the bottom or rise to the surface. All fish will be kept alive in five-gallon buckets, livecages positioned along the sample reach, or a livewell in the boat.

2.2.2 Lake and Pond Sampling

Crews of three to five people will sample shoreline areas by making a single pass with an electrofishing boat. The beginning and ending points for the sampling site will be marked on USGS 1:25,000 topographical maps. The crew will conduct at least three total-pickup collections of at least 15 minutes each. During this process, all fish will be collected and placed into the boat livewell. Other sampling methods (gillnet, seine) might also be employed to most effectively meet the sampling objective.

2.2.3 Data Collection

The first 100 fish of each species will be identified and measured to the nearest millimeter (except American eels and sea lampreys that will be measured to the nearest centimeter). The remaining fish in each species will be tallied by species with no length taken. No more than two percent and no less than two individuals (or one if only a single specimen is collected) of each species captured will be preserved in 10% formalin for confirmation of identification by laboratory analysis. Live fish that are not retained for preservation will be returned to the sample site.

2.3 Habitat Evaluation

Qualitative habitat assessments will be conducted in conjunction with fish sampling to evaluate the condition of the available habitat as it relates to fisheries resources. Stream width, canopy enclosure and species composition, channel morphology, and anthropogenic influences will be noted and assessed. Standardized habitat evaluation forms will also be used to assess habitat quality. Lake habitat will be characterized by morphology, local development and land use practices. Format and content of the information to be gathered concerning habitat measurements will follow established guidelines used by the Department of Environmental Protection (DEP) and the Fisheries Section.

2.4 Analysis

Information gathered during the course of the study will be entered into a database designed to be accessible to all parties involved with watershed management. Microsoft Access will be used as a standard format for data entry, storage, and manipulation. Initial summaries will be generated by statistical software to outline and highlight the information gathered during the sampling period. Summaries will include information about sampling locations (number of sites, towns sampled), sampling effort statistics (length of river sampled, types of gear used, estimates of efficiency), number and description of species encountered (relative abundance, common and scientific names, literature-documented tolerances) and habitat scores or descriptions for the sample sites. Further analyses relating habitat and fishery characteristics will be provided in final reports and will focus on delineating change in fishery characteristics with changes in available habitat.

2.5 Products

Several key products will result from this effort. This information will be used internally for several purposes. Habitat and fisheries assessments will be compiled in a database that will be used by the Fisheries Section for resource management, environmental review and assessment, land acquisition programs, and public access prioritization. The information will be made available to the public in an Internet accessible database that will aid in technical assistance roles. Completed watershed-based fisheries management plans will include summarized information from fisheries and habitat assessments and suggest options for improving habitat quality. These plans will provide guidance to watershed teams and volunteers concerning fish habitat restoration in their watershed. Examples of these projects include in-stream fish structures, riparian stabilization, maintenance of buffer strips, and public involvement and outreach.

3. Benefits

Results and reports from this research will be used in many decision-making processes within the Fisheries Section. Assessments of this nature, combined with habitat measurements and information gathered by other agencies and organizations will provide the necessary tools for developing watershed-based fisheries management plans, environmental reviews, and land-acquisition priorities. Enhancement efforts will take direction from these watershed-based fisheries management plans and will provide a mechanism for involving grass roots organizations and volunteers. The plans will use habitat, and fisheries information, combined with available hydrological information to identify projects that volunteers can participate in to restore habitat within the watershed. The Fisheries Section will provide technical and biological expertise to watershed groups and volunteers.

Resource assessment is a direct benefit of this project but it is only the first step. Determining the status of the resource, by assessing fish populations, available habitat and current conditions, allows agencies and organizations involved with watershed management to determine the most efficient path of watershed recovery. Once assessments have been completed, management and enhancement efforts can be effectively outlined.

References: see page 77.

APPENDIX II

FY06 STREAM SURVEY SAMPLE SITES

Watershed	Waterbody Name	SampleID	Saris/Palis	Date	Town
Blackstone	Casey Brook	1572	5132675	6/29/2006	Sutten
Blackstone	Chapin Brook	1259	5132925	9/7/2005	Leicester
Blackstone	Greene Brook	1574	5131575	6/29/2006	Douglas
Blackstone	Meadow Brook	1573	5131850	6/28/2006	Uxbridge
Blackstone	Silver Spring Brook	1698	5133100	6/27/2006	Holden
Blackstone	Tinkerville Brook	1700	5131500	6/29/2006	Douglas
Blackstone	Tinkerville Brook	1699	5131500	6/29/2006	Douglas
Blackstone	UNT to Miscoe Brook	1697	5132040	6/26/2006	Grafton
Blackstone	UNT to Wallis Pond	1578	5132355	6/26/2006	Douglas
Blackstone	UNT to Wallis Pond	1579	5132355	6/26/2006	Douglas
Buzzards Bay	MATTAPOISETT RIVER	1155	9559425	7/22/2005	Rochester
Buzzards Bay	MATTAPOISETT RIVER	1171	9559425	7/22/2005	Rochester
Cape Cod	COONAMESSETT RIVER	1424	9663000	9/21/2005	Falmouth
Cape Cod	QUASHNET RIVER	1400	9662925	8/9/2005	Mashpee
Chicopee	Atherton Brook	1210	3626700	9/12/2005	Shutesbury
Chicopee	Bottle Brook	1272	3625575	7/19/2005	Palmer
Chicopee	Burr Brook	1309	3626075	8/10/2005	Brookfield
Chicopee	Cadwell Creek	1211	3626575	9/12/2005	Pelham
Chicopee	CRANBERRY RIVER	1147	3626300	8/2/2005	Spencer
Chicopee	DANFORTH BROOK (2)	1215	3627675	8/16/2005	Hardwick
Chicopee	Dugan Brook (UNT to Ware River)	1275	3627495	7/7/2005	Ware
Chicopee	Dunn Brook	1391	3626175	8/4/2005	North Brookfield
Chicopee	Egypt Brook	1207	3626950	9/6/2005	New Salem
Chicopee	FIVEMILE RIVER	1149	3626400	7/18/2005	North Brookfield
Chicopee	FLAT BROOK	1221	3627500	7/7/2005	Ware
Chicopee	Foskett Mill Stream	1208	3625550	7/20/2005	Brimfield
Chicopee	Great Brook	1394	3626250	8/3/2005	East Brookfield
Chicopee	Horse Pond Brook	1392	3626425	7/27/2005	North Brookfield
Chicopee	JABISH BROOK	1270	3626550	8/25/2005	Belchertown
Chicopee	JABISH BROOK	1115	3626550	8/25/2005	Belchertown
Chicopee	Kings Brook	1117	3625600	7/19/2005	Palmer
Chicopee	MUDDY BROOK	1372	3627550	7/7/2005	Ware
Chicopee	MUDDY BROOK	1276	3627550	7/14/2005	Hardwick
Chicopee	Naultaug Brook	1274	3625850	7/18/2005	Warren
Chicopee	North Brook	1200	3626450	7/18/2005	North Brookfield
Chicopee	O'Neil Brook	1277	3625775	7/14/2005	Warren
Chicopee	Penny Brook	1278	3625625	7/20/2005	Brimfield
Chicopee	Pinnacle Creek	1205	3625325	8/16/2005	Monson
Chicopee	Prescott Brook	1218	3626925	9/6/2005	New Salem
Chicopee	Purgee Brook	1203	3626650	9/12/2005	Pelham
Chicopee	Salmon Brook	1308	3626100	8/10/2005	Brookfield
Chicopee	SEVENMILE RIVER	1151	3626275	7/29/2005	Spencer
Chicopee	SEVENMILE RIVER	1150	3626275	7/28/2005	Spencer
Chicopee	Sullivan Brook	1273	3625825	7/19/2005	Warren
Chicopee	TURKEY HILL BROOK	1201	3626325	7/29/2005	Spencer
Chicopee	TURKEY HILL BROOK	1202	3626325	7/28/2005	Spencer
Chicopee	Twelve Mile Brook	1216	3625200	7/21/2005	Monson
Chicopee	UNT from Quaboag Pond	1385	3626490	8/4/2005	Brookfield
Chicopee	UNT to Chicopee Brook	1212	3625490	7/21/2005	Monson
Chicopee	UNT to Coys Brook	1962	3626060	8/10/2005	West Brookfield
Chicopee	UNT to Dunn Brook	1306	3626185	8/10/2005	N. Brookfield
Chicopee	UNT to Fivemile River	1382	3626435	7/27/2005	Spencer
Chicopee	UNT to Fosket Mill Stream	1220	3625555	7/20/2005	Monson
Chicopee	UNT to Horse Pond Brook	1384	3626428	7/28/2005	North Brookfield

Watershed	Waterbody Name	SampleID	Saris/Palis	Date	Town
Chicopee	UNT to Muddy Brook	1371	3627570	7/7/2005	Ware
Chicopee	UNT to Muddy Brook	1373	3627565	8/16/2005	Ware
Chicopee	UNT to Perry Pond	1307	3626186	8/10/2005	North Brookfield
Chicopee	UNT to Purgee Brook	1269	3626660	9/12/2005	Belchertown
Chicopee	UNT to Quaboag River	1271	3625540	7/20/2005	Palmer
Chicopee	UNT to Quaboag River	1279	3625760	7/14/2005	West Warren
Chicopee	UNT to Quaboag River	1280	3625760	7/14/2005	West Warren
Chicopee	UNT to Quaboag River	1214	3625465	8/16/2005	Monson
Chicopee	UNT to Sevenmile River	1386	3626283	8/2/2005	E. Brookfield
Chicopee	UNT to Sevenmile River	1390	3626385	8/2/2005	Spencer
Chicopee	UNT to Sevenmile River	1393	3626380	8/2/2005	Spencer
Chicopee	UNT to Twelvemile Brook	1206	3625320	8/16/2005	Monson
Chicopee	UNT to Willow Brook	1311	3626140	7/27/2005	Brookfield
Chicopee	UT(Dickey Brook)	1204	3626785	9/6/2005	New Salem
Chicopee	Willow Brook	1310	3626125	8/4/2005	Brookfield
Connecticut	Big Brook	1213	3417225	8/17/2005	Hampden
Connecticut	DRY BROOK	1144	3421150	8/26/2005	Gill
Connecticut	East Brook	1217	3417250	8/17/2005	Hampden
Connecticut	Fall River	1343	3420925	8/25/2005	Bernardston
Connecticut	GODDARD BROOK	1290	3420625	8/25/2005	Montague
Connecticut	Louisiana Brook	1291	3421550	8/24/2005	Northfield
Connecticut	MANHAN RIVER (N.B.)	1358	3418400	8/18/2005	Easthampton
Connecticut	MILL BROOK (2)	1139	3421450	8/24/2005	Northfield
Connecticut	MILL BROOK (2)	1355	3421450	8/25/2005	Northfield
Connecticut	MILL RIVER (2)	1148	3419825	8/25/2005	Deerfield
Connecticut	MILL RIVER (E.B.)	1344	3419150	8/11/2005	Williamsburg
Connecticut	MILL RIVER (W.B.)	1260	3419225	8/11/2005	Williamsburg
Connecticut	Millers Brook	1140	3421375	8/24/2005	Northfield
Connecticut	PAUCHAUG BROOK	1142	3421525	8/24/2005	Northfield
Connecticut	SAWMILL RIVER	1346	3420550	9/7/2005	N. Leverett
Connecticut	SCARBORO BROOK	1219	3419525	8/25/2005	Belchertown
Connecticut	SHATTUCK BROOK	1345	3421000	8/25/2005	Bernardston
Connecticut	Sodom Brook	1348	3418450	8/18/2005	Westhampton
Connecticut	Spaulding Brook	1289	3420650	8/25/2005	Montague
Deerfield	Bear River	1246	3313950	8/4/2005	Conway
Deerfield	Bog Brook	1331	3315925	8/8/2005	Savoy
Deerfield	Borden Brook	1128	3313500	8/4/2005	Colrain
Deerfield	Brandy Brook	1126	3313275	8/10/2005	Leyden
Deerfield	Brown Brook	1320	3315600	8/30/2005	Savoy
Deerfield	Cary Brook	1135	3314400	8/3/2005	Colrain
Deerfield	Chadwick Brook	1130	3313675	8/11/2005	Conway
Deerfield	Chapel Brook	1137	3313800	8/11/2005	Conway
Deerfield	CHICKLEY RIVER	1324	3315425	8/31/2005	Savoy
Deerfield	CHICKLEY RIVER	1352	3315425	8/3/2005	Hawley
Deerfield	CHICKLEY RIVER	1321	3315425	8/30/2005	Savoy
Deerfield	COLD RIVER	1363	3315675	8/24/2005	Charlemont
Deerfield	COOLEY BROOK	1333	3314900	8/9/2005	Hawley
Deerfield	Drakes Brook	1425	3314000	8/12/2005	Ashfield
Deerfield	DUNBAR BROOK	1327	3316425	8/15/2005	Monroe
Deerfield	Fox Brook	1129	3314225	8/8/2005	Colrain
Deerfield	Glen Brook	1125	3313225	8/10/2005	Leyden
Deerfield	Granger Brook	1330	3316500	8/15/2005	Florida
Deerfield	Great Brook	1124	3313925	8/22/2005	Shelburne
Deerfield	GREEN RIVER	1341	3312925	8/23/2005	Guilford/Halifax, VT
Deerfield	GREEN RIVER	1357	3312925	8/23/2005	Leyden
Deerfield	GREEN RIVER	1263	3312925	8/23/2005	Guilford, VT
Deerfield	Harris Brook	1316	3313450	8/4/2005	Leyden
Deerfield	Hibbard Brook	1428	3313425	8/5/2005	Leyden
Deerfield	Holden Brook	1317	3314150	8/8/2005	Colrain
Deerfield	Horsefords Brook	1323	3315650	8/31/2005	Savoy
Deerfield	Houghton Brook	1134	3314125	8/8/2005	Colrain
Deerfield	Johnny Bean Brook	1121	3313725	8/11/2005	Conway
Deerfield	Johnson Brook	1292	3313400	8/8/2005	Colrain
Deerfield	Katley Brook	1315	3313350	8/10/2005	Leyden

Watershed	Waterbody Name	SampleID	Saris/Palis	Date	Town
Deerfield	Legate Hill Brook	1322	3315375	8/30/2005	Charlemont
Deerfield	McClellan Brook	1136	3314250	8/3/2005	Colrain
Deerfield	Meadow Brook	1131	3314175	8/8/2005	Colrain
Deerfield	MILL BROOK (2)	1366	3315175	8/3/2005	Charlemont
Deerfield	MILL BROOK (3)	1367	3315450	8/3/2005	Hawley
Deerfield	Miller Brook	1288	3313525	8/4/2005	Colrain
Deerfield	NORTH RIVER	1356	3314100	8/24/2005	Colrain
Deerfield	North River, East Branch	1365	3314275	8/8/2005	Colrain
Deerfield	Nye Brook	1120	3313775	8/11/2005	Conway
Deerfield	PELHAM BROOK	1351	3316075	8/4/2005	Rowe
Deerfield	POLAND BROOK	1247	3313750	8/15/2005	Conway
Deerfield	Roberts Meadow Brook	1396	3314525	8/3/2005	Colrain
Deerfield	Sanders Brook	1332	3314575	8/9/2005	Heath
Deerfield	Sheldon Brook	1143	3313550	8/22/2005	Deerfield/Greenfield
Deerfield	Shingle Brook	1141	3313850	8/22/2005	Shelburne
Deerfield	Sids Brook	1138	3314025	8/12/2005	Ashfield
Deerfield	Sluice Brook	1122	3314075	8/22/2005	Shelburne
Deerfield	Smith Brook	1328	3314800	8/31/2005	Ashfield
Deerfield	SOUTH RIVER	1349	3313650	8/15/2005	Ashfield
Deerfield	Spur Brook	1127	3314325	8/2/2005	Colrain
Deerfield	Stafford Brook	1380	3313375	8/10/2005	Colrain
Deerfield	Steele Brook	1329	3316100	8/15/2005	Florida
Deerfield	Stewart Brook	1123	3313200	8/10/2005	Shelburne
Deerfield	Thorne Brook	1314	3313475	8/4/2005	Leyden
Deerfield	Tissdell Brook	1133	3314500	8/2/2005	Colrain
Deerfield	UNT to Deerfield River	1119	3314085	8/31/2005	Buckland
Deerfield	Vincent Brook	1132	3314550	8/2/2005	Colrain
Deerfield	West Branch North River	1364	3314375	8/8/2005	Colrain
Deerfield	Workman Brook	1427	3313300	8/5/2005	Colrain
Farmington	Benton Brook	1230	3107375	7/21/2005	Otis
Farmington	BUCK RIVER	1225	3107225	7/25/2005	Sandisfield
Farmington	CLAM RIVER	1337	3107125	7/25/2005	Sandisfield
Farmington	CLAM RIVER	1336	3107125	7/27/2005	Sandisfield
Farmington	Cone Brook	1339	3107425	7/20/2005	Otis
Farmington	Dimmock Brook	1231	3107400	7/20/2005	Otis
Farmington	FARMINGTON RIVER (W.B.)	1113	3106850	7/29/2005	Sandisfield
Farmington	FARMINGTON RIVER (W.B.)	1232	3106850	7/27/2005	Otis
Farmington	HUBBARD BROOK (2)	1228	3107550	8/1/2005	Granville/Tolland
Farmington	Pond Brook	1325	3107575	8/17/2005	Granville
Farmington	Pond Brook	1112	3107575	8/17/2005	Granville
Farmington	Shales Brook	1340	3107525	7/19/2005	Becket
Farmington	Spectacle Pond Brook	1338	3107250	7/21/2005	Otis
Farmington	Thomas Brook	1223	3107450	7/20/2005	Becket
Farmington	UNT to Babcock Brook	1335	3107630	8/1/2005	Tolland
Farmington	UNT to Pond Brook	1326	3107585	8/17/2005	Granville
Farmington	Valley Brook	1334	3107700	8/1/2005	Granville
Farmington	Wheeler Brook	1233	3107350	7/20/2005	Otis
French	Bartons Brook	1301	4230425	8/23/2005	Leicester
French	FRENCH RIVER	1152	4230075	9/13/2005	Oxford
French	FRENCH RIVER	1287	4230075	9/13/2005	Oxford
French	LOWES BROOK	1381	4230260	9/14/2005	Oxford
French	Mine Brook	1576	4230225	6/27/2006	Webster
French	Potash Brook	1575	4230150	6/27/2006	Dudley
French	POTTER BROOK	1577	4230310	6/27/2006	Charlton
French	TOWN MEADOW BROOK	1388	4230375	8/23/2005	Leicester
French	UNT from Jones Pond	1285	4230295	9/12/2005	Charlton
French	UNT from Robinson Pond	1395	4230266	9/14/2005	Oxford
French	UNT from Sacarrappa Pond	1387	4230265	9/14/2005	Oxford
French	UNT from Wee Laddie Pond	1286	4230294	9/12/2005	Charlton
French	UNT to Baker Pond	1577	4230310	6/27/2006	Charlton
French	UNT to Burncoat Pond	1302	4230415	8/23/2005	Spencer
French	UNT to Jones Pond	1304	4230299	9/12/2005	Charlton
French	UNT to Little Nugget Lake	1305	4230290	9/12/2005	Charlton
French	UNT to Watson Millpond	1303	4230440	8/23/2005	Spencer

Watershed	Waterbody Name	SampleID	Saris/Palis	Date	Town
Housatonic	Cleveland Brook	1295	2105550	8/24/2005	Dalton
Housatonic	DANIELS BROOK	1296	2105925	8/4/2005	Pittsfield
Housatonic	Jacoby Brook	1226	2106100	8/25/2005	Pittsfield
Housatonic	LULU CASCADE BROOK	1298	2105850	8/4/2005	Pittsfield
Housatonic	May Brook (UNT to Windsor Reservoir)	1378	2105460	9/28/2005	Windsor
Housatonic	May Brook (UNT to Windsor Reservoir)	1376	2105460	9/28/2005	Windsor
Housatonic	May Brook (UNT to Windsor Reservoir)	1377	2105460	9/28/2005	Windsor
Housatonic	Parker Brook	1297	2105825	8/4/2005	Pittsfield
Housatonic	SMITH BROOK	1294	2106075	8/25/2005	Pittsfield
Housatonic	SMITH BROOK	1227	2106075	8/4/2005	Pittsfield
Hudson	TOPHET BROOK	1318	1101250	8/8/2005	Adams
Hudson	TOPHET BROOK	1293	1101250	8/8/2005	Adams
Millers	MILLERS RIVER	1145	3522150	8/23/2005	Wendell
Millers	MILLERS RIVER	1146	3522150	8/23/2005	Orange
Millers	UNT to Millers River	1313	3522370	8/23/2005	Wendell
Mt.Hope/ Narragansett	Maybe Brook (UNT to Cole River)	1374	6134574	8/1/2005	Dighton
Nashua	STILLWATER RIVER	1261	8145700	8/22/2005	W. Boylston
Nashua	STILLWATER RIVER	1262	8145700	9/2/2005	Sterling
Nashua	STILLWATER RIVER	1264	8145700	8/31/2005	W. Boylston
Parker	BACHELDER BROOK	1183	9153250	8/3/2005	Rowley
Parker	BULL BROOK	1198	9153000	8/4/2005	Ipswich
Parker	BULL BROOK	1199	9153000	8/4/2005	Ipswich
Parker	DOW BROOK	1180	9152975	8/4/2005	Ipswich
Parker	Egypt River	1186	9152925	8/4/2005	Ipswich
Parker	Great Swamp Brook	1176	9153275	8/2/2005	Rowley
Parker	Jackman Brook	1239	9153350	7/28/2005	Georgetown
Parker	MILL RIVER (2)	1375	9153200	8/2/2005	Rowley
Parker	MILL RIVER (2)	1178	9153200	8/15/2005	Rowley/Newbury
Parker	MILL RIVER (2)	1190	9153200	8/2/2005	Rowley
Parker	Muddy Brook	1177	9153300	7/28/2005	Rowley/Georgetown
Parker	Ox Pasture Brook	1184	9153225	8/3/2005	Rowley
Parker	Ox Pasture Brook	1188	9153225	8/3/2005	Rowley
Parker	PARKER RIVER	1187	9153150	8/8/2005	Georgetown
Parker	PARKER RIVER	1235	9153150	8/9/2005	Newbury
Parker	PARKER RIVER	1236	9153150	8/3/2005	Newbury
Parker	PARKER RIVER	1238	9153150	8/9/2005	Byfield
Parker	PARKER RIVER	1192	9153150	8/8/2005	Byfield
Parker	PARKER RIVER	1194	9153150	8/9/2005	Georgetown
Parker	PENN BROOK	1174	9153400	7/28/2005	Georgetown
Parker	PENN BROOK	1173	9153400	7/28/2005	Georgetown
Parker	Wheeler Brook	1175	9153325	7/28/2005	Georgetown
Quinebaug	HOLLOW BROOK	1222	4129475	8/22/2005	Wales
Quinebaug	UNT to Mill Brook	1209	4129320	8/23/2005	Brimfield
Quinebaug	UNT to Tufts Branch	1383	4129055	7/13/2005	Dudley
Quinebaug	UNT to Tufts Branch	1389	4129055	7/13/2005	Dudley
Shawsheen	CONTENT BROOK	1161	8349150	7/20/2005	Billerica
Shawsheen	CONTENT BROOK	1162	8349150	7/20/2005	Tewksbury
Shawsheen	ELM BROOK	1160	8349375	7/18/2005	Bedford
Shawsheen	ELM BROOK	1193	8349375	7/18/2005	Bedford
Shawsheen	Heath Brook	1242	8349125	7/20/2005	Tewksbury
Shawsheen	Hussey Brook	1191	8349025	7/26/2005	Andover
Shawsheen	Long Meadow Brook	1179	8349325	7/22/2005	Burlington
Shawsheen	McKee Brook	1240	8349250	7/19/2005	Billerica
Shawsheen	Meadow Brook	1181	8349100	7/21/2005	Tewksbury
Shawsheen	Rogers Brook	1257	8349050	7/26/2005	Andover
Shawsheen	SHAWSHEEN RIVER	1196	8349000	7/21/2005	Andover
Shawsheen	SHAWSHEEN RIVER	1195	8349000	7/26/2005	Lawrence
Shawsheen	SHAWSHEEN RIVER	1237	8349000	7/26/2005	Lawrence
Shawsheen	SHAWSHEEN RIVER	1189	8349000	7/18/2005	Bedford
Shawsheen	SHAWSHEEN RIVER	1268	8349000	7/19/2005	Bedford
Shawsheen	Spring Brook	1197	8349350	7/19/2005	Bedford
Shawsheen	STRONG WATER BROOK	1182	8349075	7/20/2005	Tewksbury
Shawsheen	Vine Brook	1185	8349275	7/22/2005	Burlington

Watershed	Waterbody Name	SampleID	Saris/Palis	Date	Town
Shawsheen	Webb Brook	1241	8349200	7/19/2005	Billerica
Shawsheen	Webb Brook	1312	8349200	7/19/2005	Billerica
South Coastal	EEL RIVER	1422	9458000	9/20/2005	Plymouth
Taunton	Beaver Dam Brook	1153	6236250	7/14/2005	Middleboro
Taunton	Beaverdam Brook	1153	6236250	7/14/2005	Middleboro
Taunton	CANOE RIVER	1641	6235850	5/25/2006	Norton
Taunton	Hawthorne Brook	1252	6235575	9/9/2005	Plainville
Taunton	Mulberry Meadow Brook	1167	6235775	7/26/2005	Easton
Taunton	Nemasket River	1397	6236225	8/4/2005	Middleboro
Taunton	Nemasket River	1165	6236225	7/21/2005	Middleboro
Taunton	Nemasket River	1168	6236225	7/14/2005	Middleboro
Taunton	Nemasket River	1163	6236225	7/13/2005	Lakeville/Middleboro
Taunton	Old Mill Brook	1258	6235550	9/9/2005	Plainville
Taunton	Poquanticut Brook	1170	6235825	7/26/2005	Easton
Taunton	SEGREGANSET RIVER	1159	6235300	7/6/2005	Dighton
Taunton	Snake River	1154	6235750	7/20/2005	Taunton/Norton
Taunton	TAUNTON RIVER	1265	6235000	8/18/2005	Bridgewater
Taunton	Threemile River	1166	6235350	8/2/2005	Norton
Taunton	Tucker Brook (UNT to Sawmill Brook)	1423	6236196	11/16/2005	Bridgewater
Taunton	UNT- Meadow Brook	1250	6235585	9/9/2005	Wrentham
Taunton	WADING RIVER	1164	6235450	8/2/2005	Norton
Ten Mile	TEN MILE RIVER	1251	5233625	9/9/2005	Plainville
Westfield	DEPOT BROOK	1118	3210600	8/3/2005	Washington
Westfield	Dickenson Brook	1360	3208975	8/17/2005	Granville
Westfield	FACTORY BROOK	1369	3210475	8/2/2005	Middlefield
Westfield	Freeland Brook	1300	3209900	8/2/2005	Blandford
Westfield	KINNE BROOK	1342	3210800	8/9/2005	Chester
Westfield	MILL BROOK (1)	1114	3211950	8/10/2005	Cummington
Westfield	MUNN BROOK	1359	3208825	8/17/2005	Southwick
Westfield	Roaring Brook (1)	1368	3210000	8/1/2005	Montgomery
Westfield	Roaring Brook (2)	1353	3210125	8/1/2005	Chester
Westfield	SHAKER MILL BROOK	1234	3210625	8/3/2005	Becket
Westfield	STAGE BROOK	1347	3209850	8/2/2005	Russell/Blandford
Westfield	STONES BROOK	1362	3211825	8/16/2005	Goshen
Westfield	SWIFT RIVER (N.B.)	1361	3211800	8/16/2005	Cummington
Westfield	Tower Brook	1350	3211700	8/29/2005	W. Chesterfield
Westfield	TROUT BROOK	1229	3211025	8/29/2005	Peru/ Worthington
Westfield	WALKER BROOK	1370	3210300	8/2/2005	Chester
Westfield	WEST BRANCH BROOK	1354	3211525	8/29/2005	Worthington
Westfield	WESTFIELD BROOK	1243	3212050	8/10/2005	Cummington
Westfield	WESTFIELD RIVER	1248	3208250	8/10/2005	Cummington
Westfield	WESTFIELD RIVER (M.B.)	1224	3210725	8/29/2005	Chester
Westfield	WESTFIELD RIVER (M.B.)	1319	3210725	8/29/2005	Worthington
Westfield	WESTFIELD RIVER (M.B.)	1245	3210725	8/9/2005	Middlefield/Worthington
Westfield	WESTFIELD RIVER (W.B.)	1249	3210075	8/9/2005	Chester
Westfield	YOKUM BROOK	1116	3210550	8/3/2005	Becket

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