FY2017

Annual Report

July 1, 2016—June 30, 2017

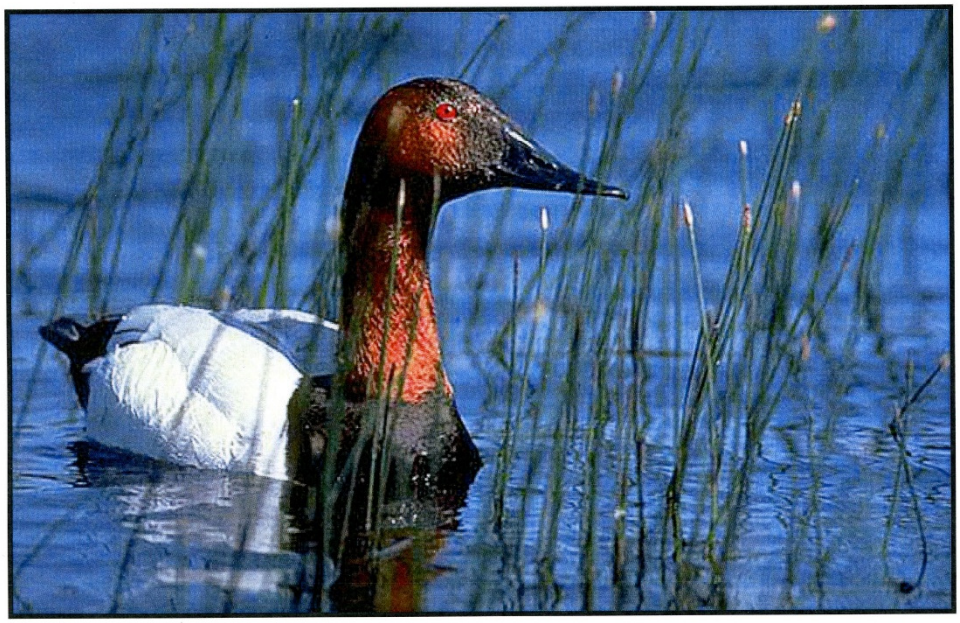


Photo: Canvasback Duck USFWS/W. Vinje

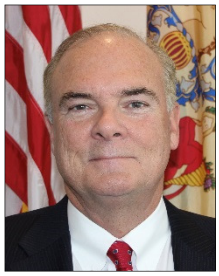
State of New Jersey
Department of Environmental Protection
Division of Fish and Wildlife

Follow us on Facebook
Visit our website at www.njfishandwildlife.com

NEW JERSEY DIVISION OF
Fish and Wildlife

FY2017 Annual Report

State of New Jersey
Department of Environmental Protection
Division of Fish and Wildlife
Mail Code 501-03
P.O. Box 420
Trenton, NJ 08625-0420
www.njfishandwildlife.com



Message from DEP Commissioner Bob Martin

I am pleased to present the Department of Environmental Protection's (DEP) Division of Fish and Wildlife's Annual Report for Fiscal Year 2017 covering the period of July 1, 2016 to June 30, 2017. As in previous years, each section begins with an overview of a Division bureau or office along with several highlights from the year. Each page features the important work our biologists are involved in every day to protect and manage fish and wildlife, the habitats they depend upon and the variety of recreational opportunities associated with New Jersey's wild outdoors.

The Division of Fish and Wildlife (Division), which today manages nearly 350,000 acres of wildlife management areas, is one of the oldest state wildlife management agencies in the country. It traces its beginning to March 8, 1892 with legislation calling for "the appointment of three fish and game commissioners and one salaried game protector for the better protection of fish and game animals, and enforcement of the laws pertaining to those species."

In March 2017, the DEP's Division of Fish and Wildlife marked the beginning of its 125th year by rededicating itself to its original mission of conserving wildlife and providing recreational opportunities for future generations of hunters, anglers and wildlife enthusiasts. We are truly fortunate to have a remarkable diversity of fish and wildlife species in New Jersey and so many dedicated professionals who are passionate about protecting and properly managing these resources for the public's benefit.

New Jersey's diverse ecosystems support the state's amazing variety of wildlife; the wooded and rocky ridges of the Highlands that are home to bears and bobcats; the vast pitch pine forests of the Pinelands that provide habitats for unique amphibians and reptiles; the coastal beaches, dunes and marshes that teem with osprey, shorebirds and wading birds; the Delaware Bay region, featuring the State's largest concentration of bald eagles; and Cape May, known worldwide as a premier location to view the migration of hawks and monarch butterflies.

Today the Division has a role in managing all fish and wildlife in New Jersey. Staff members also educate the public about wildlife-related issues, and conservation officers enforce the laws that protect these species.

If you have not done so already, visit our website and Facebook page to learn more about the impressive history of this agency. I also encourage you to attend one of the special Division events intended to celebrate this milestone year and the many other conservation achievements only made possible through the hard work, passion and unwavering commitment of the professionals who have been dedicated to this agency and its mission over the past 125 years.

New Jersey Division of Fish and Wildlife

The New Jersey Division of Fish and Wildlife is a professional, environmental organization dedicated to the protection, management and wise use of the State's fish and wildlife resources.

Our Mission

To protect and manage the State's fish and wildlife to maximize their long-term biological, recreational and economic value for all New Jerseyans.

Our Goals

- To maintain New Jersey's rich variety of fish and wildlife species at stable, healthy levels, and protect and enhance the many habitats on which they depend.
- To maximize the wise use of New Jersey's fish and wildlife for present and future generations.
- To educate New Jerseyans on the values and needs of fish and wildlife, and to foster a positive human/wildlife co-existence.

Table of Contents

Bureau of Freshwater Fisheries
Lisa Barno, Chief

Recreational freshwater fishing is a great way to get out and enjoy the outdoors.

The Bureau of Freshwater Fisheries (Bureau) is responsible for the protection and management of the State's freshwater fisheries resource as well as promoting its recreational use. The Bureau conducts research and management surveys, classifies the State's waterways, provides technical input on a variety of watershed and habitat based issues, facilitates habitat restoration projects, serves as a liaison to a variety of conservation groups, and provides information to the public in a variety of forums concerning New Jersey's freshwater fisheries. The Bureau also administers more than 600 permits annually to help effectively manage and protect this important resource.

Highlights

The Division's two fish hatcheries were reintegrated with the Bureau of Freshwater Fisheries to once again provide a coordinated approach to the management of the State's freshwater fisheries resources. During this reporting period, the Charles O. Hayford Hatchery in Hackettstown reared a record-setting 28,404 pounds of fish. This is the largest amount of fish ever produced since the hatchery was converted exclusively to warmwater/coolwater production in 1983. A total of 3,689,447 fish, representing fourteen different species, were reared and distributed throughout the State. The hatchery also supplied county mosquito control commissions (under the direction of the State Mosquito Control Commission) with more than 219,000 gambusia and 464,800 fathead minnows to assist with mosquito control efforts. Hackettstown staff also stocked 3,455 landlocked salmon averaging 7.6 – 17.3 inches in length in Tilcon Lake, and Lakes Aeroflex and Wawayanda. These salmon are obtained through a fish trade with the Commonwealth of Massachusetts in exchange for surplus young northern pike.

The Pequest Trout Hatchery raised 588,930 catchable sized rainbow trout for the 10-week Spring Stocking Program. An additional 21,535 trout were reared for the fall and 5,100 for the winter stocking programs.

During this time, freshwater fisheries biologists conducted 237 surveys collecting more than 65,000 fish of 76 species. Surveys were undertaken for a wide variety of projects, including the final year of a *Coolwater Fisheries Assessment* regarding the stocking programs for muskellunge, northern pike, walleye, and hybrid striped bass at 12 lakes. In addition, warmwater populations were electro-fished at 32 waterbodies to better manage recreational fisheries for these popular species.

Regarding coldwater species, staff members continued to investigate the effects of current wild trout stream regulations to better manage these valuable native resources. Other fisheries surveys were used to monitor populations, assess stocking programs, map the distribution of rare native fishes, and document or control populations of invasive fish and aquatic plants.

An intensive fisheries inventory was conducted at Round Valley Reservoir, the second largest lake in New Jersey (2,350 acres with a maximum depth of 160 feet). This popular waterbody has produced four current state record fish (lake trout, brown trout, smallmouth bass and American eel). The reservoir is unique for New Jersey in that it supports a two-tier fishery for both coldwater *and* warmwater fish populations.

Two online angler surveys were also conducted. One study centered on anglers' opinions and attitudes on freshwater fishing opportunities; the other pertained to fishing for wild trout and wild trout stream regulations.

Bureau of Land Management

Dave Golden, Chief

The Bureau of Land Management (BLM) is responsible for administering the Division's Wildlife Management Area System (WMA) encompassing more than 349,000 acres on 122 separate areas. These areas are managed for a diversity of fish and wildlife species through a variety of habitat improvement programs. Public access for wildlife-associated recreation is encouraged through the development of visitor facilities, maintenance of roads and bridges, and the construction of parking areas and boat ramps. The Bureau is also responsible for the maintenance of Division facilities including buildings, shooting ranges, dams, and water control structures. In addition, the BLM offers technical assistance to the DEP's Green Acres Program in the acquisition of open space and critical habitat.

Highlights

Staff in the northern region continued to work on the boat ramp at Round Valley Reservoir in Hunterdon County. As water levels fell from the summer drought, a secondary ramp adjacent to the main structure was created to provide additional boating access. Several truckloads of stone were needed to complete the job and additional stone was added to the main boat ramp as well.

Habitat projects in wildlife management areas (WMAs) in the northern region are ongoing. Dirt roads within the Flatbrook, Black River and Pequest WMAs were re-graded and graveled. Efforts to battle invasive exotic vegetation such as multiflora rose, autumn olive, Japanese barberry and mile-a-minute vine continued at several WMAs. Water Chestnut on Amwell and Ryker lakes within the Sparta Mountain WMA was professionally treated to control growth. Staff members continue to mow fields to maintain ideal pheasant hunting habitat and hydroaxe where necessary to reclaim areas for pheasant hunting. Kestrel habitat was maintained at the South Branch WMA by hydroaxing fields in which Eastern red cedar and Bradford pear were growing.

On the Clinton WMA, limestone deposits have caused many sinkholes. Some are small, just a few square feet. One however, formed quickly near a road that is essential for accessing an important well and measured 20 ft. x 20 ft. Because of these conditions, staff worked with geologists, engineers and an excavator to fill two of the largest holes. Additional geophysical testing on numerous smaller sinkholes is ongoing.

There are 77 dams within the Division's WMA System. Assunpink has five dams within its boundaries alone, all constructed between 1966-1975 as flood protection for the Assunpink Watershed, and for use recreationally along Assunpink Creek and its tributaries. Staff members have expended considerable time and effort bringing these dams into safety compliance for inspection each year. The dams are mowed on a regular basis 3-4 times per season to prevent the growth of woody vegetation and sometimes, as during this reporting period, professional services are contracted to remove heavy vegetation within the rip rap of the dam face as well as treat the areas with herbicide to control growth. Every dam in New Jersey is given a hazard classification of low, significant or high based on potential loss of human life, economic impacts, environmental importance and other factors. The five dams on Assunpink include one high and four low hazard designations. Two of the four low hazard ratings were recommended for reclassification to *high* hazard due to recent development downstream. As a result, staff applied for $3 million in funding from the Federal Natural Resource Conservation Service to help bring these dams into total safety compliance.

The Division stocks thousands of pheasants on WMAs annually.

In FY17, staff members completed 660 acres of upland habitat enhancements on WMAs throughout the southern region (Glassboro, Winslow, Tuckahoe, Peaslee, Millville, Higbee, Cape Island, Dix, Nantuxent, Buckshutem, Salem, Mad Horse and Heislerville). Improvements include various plantings to provide food and cover for the pheasants and quail that are stocked by the Division, as well as pollinators such as Monarch butterflies. Seed species sown throughout the area include a variety of warm season grasses, rye, sorghum, and pollinator mixes of wildflowers and sunflowers. Significant marsh restoration efforts have also been undertaken at the Fortescue and Avalon WMAs using recycled dredge materials to encourage coastal resiliency against severe weather events.

Bureau of Law Enforcement

Matt Brown, Acting Chief

The Bureau of Law Enforcement is responsible for enforcing regulations that protect wildlife and its habitat. Highly trained conservation officers patrol the state and its waters using the latest in law enforcement technology. These officers investigate all types of cases, including hunting and freshwater fishing violations, illegal marine and shellfish harvesting, collection and sale of endangered species, and even water pollution.

Conservation officers are among the Division's most visible representatives, interacting with thousands of individuals each year. In the field, they educate and redirect the actions of recreationists to ensure compliance with Division policies, the Fish and Game codes, marine conservation measures and other land use regulations to protect the environment as well as ensure that people enjoy natural resources in safe and ethical ways.

As one of the oldest organized law enforcement agencies in the State of New Jersey (created in 1871), conservation officers have enjoyed a storied history. Originally tasked strictly with fish protection in the Delaware River, officers now delve into every area of fish, wildlife and natural resource protection. They now enforce pollution laws involving New Jersey's woods and waterways, impose bans on the harvest of crabs from polluted waters, enforce clamming and oystering regulations designed to safeguard public health, assist with efforts to control nuisance bears, enforce commercial and recreational saltwater fishing regulations, protect State lands from illegal timber sales and off-road vehicle usage, and ensure the lawful handling of exotic wildlife and the sale of legally procured marine resources.

Conservation officers are also the primary law enforcement personnel in New Jersey who are authorized to investigate hunting accidents or fatalities. They are uniformed officers with full law enforcement authority.

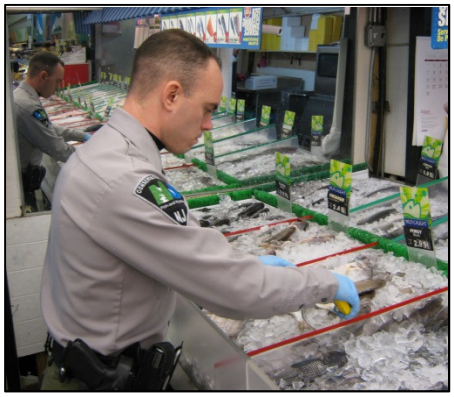
Each year, conservation officers provide countless hours of public outreach at educational facilities, outdoors shows and through the course of their daily patrols. Educating hunters, anglers and the public about the environment and all that makes it beneficial is a paramount assignment that conservation officers are proud to perform.

Highlights

Conservation officers in the northern region have been extremely successful using standard trail cameras in their fight against off road vehicles and other illegal activities on State property. Recently they made apprehensions on the Paulinskill, Hamburg Mountain and Silver Lake WMAs in Sussex County. Trail cam photos captured several instances of perpetrators illegally off-roading on these areas. In each case, the images eventually led to a variety of charges, including reckless driving, operating motor vehicles on prohibited areas, disturbing soil, damaging vegetation and causing property damage. Trail cams are also proving indispensable by providing evidence for illegal dumping incidents. One case involved a pickup truck that was photographed pulling into a WMA parking lot with garbage bags in the bed. Two individuals exited the vehicle and threw the bags into the woods. Upon later inspection of the trash, officers

could find no personal identifying information. *However*, the trail camera captured the license plate and as a result, two juvenile suspects confessed to the violation. Given the success of their use, the Bureau is not only acquiring additional units, but several models rated for high speed photography to *specifically* capture license plates.

Central region conservation officers received a complaint from an individual who witnessed a man shoot two antlered deer in North Hanover Township, Burlington County. The complainant had been hunting that morning when he observed two men hunting a neighboring private property. After witnessing *one* of them shoot and kill *two* bucks, he saw both men load the deer into their vehicle. As they drove away, the complainant was able to get a license plate and description. It was registered to a company in South Jersey. After examining the crime scene, the investigating conservation officer spoke with some nearby farmers to see if any had conducted business with the company. One of the farmers told the officer about an employee of that company who was an avid hunter in the area. The officer was able to locate an individual who fit the description. Upon interviewing the suspect, the hunter admitted to shooting the two bucks, but registering only one. He was issued the appropriate summons for failing to register the deer.



Upon inspection, an officer finds this fish market to be in compliance with marine enforcement regulations.

In January, marine conservation officers (MCOs) charged an Atlantic City market for multiple violations after receiving numerous complaints from concerned citizens that the establishment routinely purchased fish from local recreational anglers unauthorized to sell it. As the MCOs conducted routine surveillance on the market, they observed striped bass and other marine species being delivered by local recreational anglers. When an officer disguised as a recreational angler negotiated multiple sales of regulated marine finfish, they established the owner's willingness to commit an unlawful transaction. Shortly thereafter, another officer disguised as a patron purchased fish sold to the market by the first officer. Finally, MCOs conducted a retail inspection of the establishment and found undocumented sea scallops, black sea bass, conch and American lobster. Ten summonses were issued for buying summer flounder directly from a harvester without a dealer permit, buying tautog during a closed commercial season, buying black sea bass directly from a harvester without a dealer permit, possessing wild striped bass with the intention to sell and failure to maintain accurate records for the purchase of marine resources.

Marine Fisheries Administration
Vacant, Administrator

The Marine Fisheries Administration (MFA) includes the Bureaus of Marine Fisheries and Shellfisheries. The MFA supervises and coordinates the planning, organization, operation and management of the marine and estuarine finfish and shellfish resources of New Jersey, which are worth more than $2 billion. The MFA also coordinates New Jersey's fishery management activities on a coastwide basis with the Atlantic States Marine Fisheries Commission and the Mid-Atlantic Fishery Management Council.

Bureau of Marine Fisheries
Russ Allen, Chief

The Bureau of Marine Fisheries is responsible for developing and implementing management programs that protect, conserve and enhance New Jersey's marine fisheries resources. To formulate sound state management plans, the Bureau conducts studies to gather information about New Jersey's marine species as well as the user groups that rely on them. This research is combined with information from other Atlantic states and federal management agencies to support coastwide management plans.

Since many marine fisheries species are migratory in nature, they are managed on a coastwide basis by the Atlantic States Marine Fisheries Commission (ASMFC) and/or the Mid-Atlantic Fishery Management Council. The Bureau plays a vital role in representing New Jersey's fisheries and fishermen (both commercial and recreational) through these organizations.

Pictured is a recent vessel sinking and deployment of concrete material off the Jersey Coast.

Federal legislation mandates that states implement every fishery management plan approved by the ASMFC. Each plan requires that states employ the required management measures, enforce those rules and monitor the status of the fishery population. States failing to comply with the requirements of the plan risk a federally imposed moratorium in their state for those species covered.

Highlights

After a five-year hiatus, the Division's popular Artificial Reef Program was re-established in June of 2016. The Division now has permission to develop and maintain a total of 17 reef sites over the next ten years. Since that time, two new reefs were added to the original network of 15, using 12 vessels, 6,000 tons of concrete material and 156,000 tons of dredge rock to create the reefs. In addition, staff members initiated a collaborative project with Rutgers University to study reef

fishing activity and colonization. By continuing to study and enhance the State's reef network, the Bureau of Marine Fisheries is creating habitat on an otherwise featureless ocean floor that will benefit a variety of marine life and divers and anglers as well.

As part of the Delaware Basin Fish and Wildlife Management Cooperative (Cooperative), the Bureau of Marine Fisheries jointly manages the commercial and recreational American shad fisheries in the Delaware River and Bay along with the states of New York, Pennsylvania and Delaware. To keep the shad fishery open, Cooperative biologists are required to develop a Sustainable Fishery Plan (SFP) from the survey data collected throughout the year. In 2012, the first Cooperative-developed SFP for American shad was approved by the Atlantic States Marine Fisheries Commission (ASMFC) for implementation up to and including the 2016 fishing season.

With the old plan nearing an end, bureau biologists updated databases, analyzed population trends and fishing pressure to negotiate on behalf of New Jersey anglers for continued shad fishing opportunities under a new SFP without endangering the health of the population. The extensive work paid off when the ASMFC again approved the Cooperative's proposed American Shad SFP in January. The new plan covers the 2017 fishing season up to and including 2021. New Jersey's recreational and commercial fishermen can continue to fish for American shad without any regulation changes (barring any significant decline in the American shad population within the river basin).

Accurate commercial harvest information is critical to many aspects of fishery management, such as determining *sustainable* harvest levels and ensuring *equitable* allocation of regional quotas. In the past, the Bureau had to rely solely on mandatory commercial harvest reporting for a select number of species that unfortunately, resulted in incomplete data for the fishery as a whole. To complicate matters, traditional reporting was a burden to those anglers who landed multiple species as each one required a separate paper form.

To address these issues, staff implemented a new comprehensive commercial harvest reporting program for all finfish species in January 2016. Using standardized reporting procedures, the new system offers biologists a more complete picture of harvesting practices in New Jersey and alleviates the previously demanding reporting process. After the first year of implementation, 115 Garden State commercial fishermen reported 3,652 fishing trips. Total landings were 8,539,103 pounds consisting of 26 different species. Although compliance is not 100%, it has increased significantly with the addition of outreach and technical support. This enhanced dialogue between biologists and the commercial fishing industry revealed aspects of the program that could be improved. By addressing these concerns and working together, biologists can join with other Atlantic states in developing regional (and sustainable) management strategies that will ensure New Jersey receives an equitable share of the harvest. Supported by better data, we now have a stronger voice at the table.

Bureau of Shellfisheries
Russ Babb, Acting Chief

Biologists undertake a hard clam stock assessment survey.

The Bureau of Shellfisheries directs shellfish harvest and production programs on the Atlantic Coast and in Delaware Bay. Biologists work with other Division bureaus as well as various state and federal agencies on marine habitat conservation and shellfish management. Staff members work closely with the New Jersey Shellfisheries Council, an advisory board to the DEP Commissioner, on issues related to the protection and enhancement of New Jersey's shellfisheries. They are also engaged in fostering aquaculture development and reviewing coastal development activities to protect critical habitat. Staff members manage surf clams in the Atlantic Ocean and oysters in Delaware Bay as well as examine the impacts of offshore sand mining. In addition, they are responsible for administering a licensing program for recreational and commercial shellfishermen as well as the State's Shellfish Aquaculture Program.

Highlights

Staff from the Bureau of Shellfisheries teamed up with the Atlantic Coast Section of the New Jersey Shellfisheries Council (Council) and the Leasing Committee to plan and create a guidance document designed to develop policies for managing shellfish aquaculture leases in New Jersey's Atlantic tidal waters. The document is the first of its kind and the product of a two-year collaborative effort to implement a standardized leasing policy. In the past, such policies were made on a case by case basis. This resulted in an ad hoc allocation and establishment of shellfish aquaculture leases. The Bureau felt that a comprehensive management plan was needed and worked with the Council to create stakeholder committees to solicit recommendations. The document is a work in progress and will be revised as often as necessary to reflect the changing needs of the shellfish aquaculture industry.

Bureau staff conducted a Hard Clam Stock Assessment Survey of the Navesink and Shrewsbury rivers in Monmouth County. Preliminary findings compared 2015 data to the information collected in 1983 when these two rivers were last sampled. Results indicate that the population in the Navesink River increased by approximately 19%, while the Shrewsbury population appears to have decreased by about 13%. A final report with additional comparative analysis and species distribution information should be available in late 2017. Bureau staff members are also processing data collected from the Great Bay Estuary in 2016, which was last sampled in 1988. Due to inclement weather and other constraints the full survey could not be completed in 2016 so research efforts will continue in 2017.

Bureau staff participated in the 19th Stock Assessment Workshop for the oyster resource and fishery in Delaware Bay. Considered stable with the ability to sustain a fishery, the Stock Assessment Review Committee recommended an allowable landings total of 104,784 bushels prior to a major oyster transplant. However, once the extremely successful relocation occurred

the quota was increased to more than 124,000 bushels – the largest allocation in nearly 20 years. Management strategies to produce larger, more marketable oysters have begun to succeed, as indicated in the industry's increased daily catch rates and daily harvest counts per vessel. Shellfisheries biologists, along with researchers from Rutgers University, will continue to monitor long-term trends in oyster size, frequency and overall population health to ensure sustainability of the resource.

Bureau of Wildlife Management

Carole Stanko, Chief

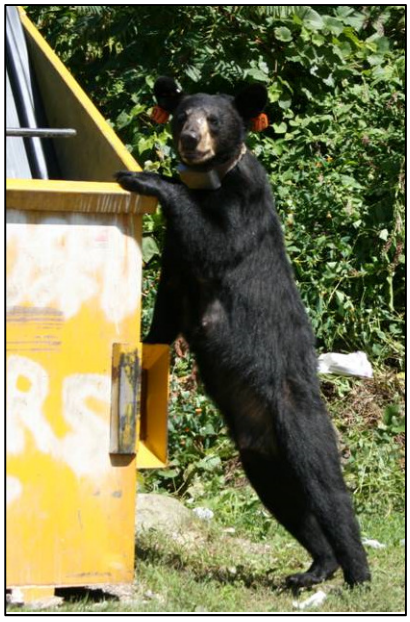
The Bureau of Wildlife Management provides the scientific information and recommendations necessary to develop conservation plans for New Jersey's game species. It also manages breeding operations for the Division's Pheasant Stocking Program and assists the public in reducing damage caused by wildlife. Biologists work with other agencies and local governments to develop cooperative management programs throughout the State. These professionals also monitor wildlife population numbers and health conditions. The information collected is of critical importance to the Fish and Game Council, which relies on it to determine New Jersey's annual hunting and trapping regulations.

Highlights

New Jersey held its first modern archery hunt for black bears in nearly 50 years and it was extremely successful. Since 2010, the Black Bear Hunting Season was held concurrently with the Six-day Firearm Deer Season in December. In 2016 however, an additional six days of bear hunting was added in October, consisting of three days of archery-only hunting and three days of archery *or* muzzleloader hunting. The modification was designed to increase the bear harvest since New Jersey's December season was not meeting the population reduction goal.

Under the present framework in any given year, if the harvest does not reach a minimum of 20% of the bears tagged during that same year, the season may be extended for four days. Conversely, if in any given time during the season the harvest meets 30% of bears tagged in the current year, the season will automatically close.

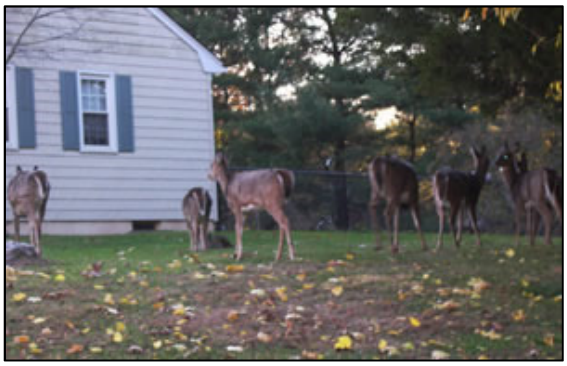
In 2016, the October segment's harvest percentage reached 23.4% with 562 bears harvested. Coupled with the December segment's harvest of 74 bears, New Jersey's total harvest for 2016 was 636 bears. By the end of the regular season on December 10, the harvest rate of tagged bears was 25.9% eliminating the need for added days, and indicating a robust and expanding black bear population in the Garden State.



A New Jersey black bear sporting ear tags.

Staff members' research resulted in the following publications during FY17:

- Recreational harvest and incident-response management reduce human–carnivore conflicts in an anthropogenic landscape, *Journal of Applied Ecology*, Jarod D. Raithel, Melissa J. Reynolds-Hogland, David N. Koons, Patrick C. Carr and Lise M. Aubry



White-tailed deer are a familiar sight on suburban lawns across the Garden State.

Deer herds can cause significant damage to private acreage. To help farmers and other landowners protect their properties from deer-imposed devastation, the Division issues special depredation permits. Based on the data collected to date, a total of 1,574 deer were harvested through these permits during the first half of FY16.

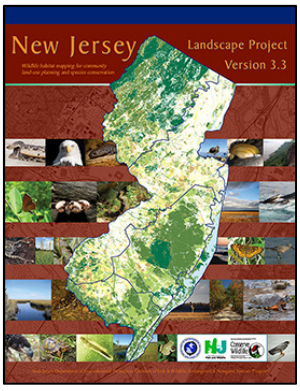
Endangered and Nongame Species Program

Dave Jenkins, Chief

The Endangered and Nongame Species Program (ENSP) was created in response to the enactment of the New Jersey Endangered Species Act of 1973. More than 80 endangered and threatened species inhabit the Garden State, and many more stop here to rest and refuel during their migrations. To protect these species, the ENSP is committed to conserving New Jersey's biological diversity by working to maintain and foster endangered and threatened populations as well as protect the unique habitats on which they depend. The ENSP is also responsible for administering the State Income Tax Check-Off for Wildlife, which benefits these species.

Highlights

A revised version of the Landscape Project containing information on the habitats of various endangered and nongame wildlife species across New Jersey was released to the public. Designed as a tool to guide strategic conservation decisions, the Landscape Project utilizes the latest Geographic Information Systems (GIS) technology to map species locations and life histories, as well as land use/land cover descriptions for endangered, threatened and wildlife species of special concern throughout the State. *New Jersey's Landscape Project Report, Version 3.3* is available as a downloadable PDF file on the Division of Fish and Wildlife's website. This newest version incorporates species not previously represented, such as Atlantic sturgeon and northern long-eared bat (northern *myotis*).



New Jersey's newly revised Landscape Project.

The Allegheny woodrat is one of New Jersey's most imperiled wildlife species. Listed as endangered here and a focal species in the State Wildlife Action Plan, woodrats have been experiencing a decline in the northern half of their range. They have already disappeared from Connecticut, Massachusetts and New York, and are experiencing declines in Pennsylvania, Maryland and Virginia. New Jersey has just one active site remaining in Palisades Interstate Park (Palisades), which now represents the northeastern most extent of their range.

An endangered Allegheny woodrat in Palisades Interstate Park.

The ENSP, in collaboration with the Pennsylvania Game Commission and both Montclair State and Towson universities, conducted a relocation study for the second consecutive year. Though still present in New Jersey, the population has been showing signs of genetic isolation which, over time, can limit its ability to adapt and survive. To alleviate the problem, two juvenile Allegheny woodrats from Pennsylvania were relocated to the Palisades in an effort to introduce genetic diversity. The new woodrats are being closely monitored with radio collars and cameras. Biologists plan to take DNA samples from captured individuals as part of their annual population survey to determine whether the reintroduction was successful.

Raccoon roundworm infection has become a serious mortality factor for Allegheny woodrats. In an additional effort to maintain and foster the Palisades population, the ENSP has been partnering with Montclair State and Purdue universities, AmeriCorps and Wheaton College to implement a roundworm mitigation plan. Using funds from a federal *Regional Conservation Needs Grant*, the ENSP has also partnered with woodrat researchers from Pennsylvania and Maryland to conduct habitat inventories and evaluate the prevalence of raccoon roundworm at woodrat sites in these states. The collaboration marks the beginning of a regional effort to develop conservation strategies that will help the Allegheny woodrat population recover for the future.

FY17 marks the 20th year of shorebird monitoring and research in New Jersey. Unfortunately, over the last two decades, biologists have observed significant declines in the population numbers of many shorebird species, including the Arctic-nesting red knot. In early 2016, the red knot was listed as federally threatened. As migratory shorebirds rely on numerous coastal stopovers in North and South America, federal listing may bring much-needed conservation of beach and intertidal habitats throughout the country, including New Jersey's Atlantic and Delaware Bay coasts where red knots and other shorebirds stop to rest and refuel before continuing their migratory journeys.

Peak counts of red knot on the Delaware Bay stopover, which had been stable since 2009 declined in 2016 and 2017. Five other migrant shorebirds reliant on the Delaware Bay stopover have also declined, including the ruddy turnstone, semipalmated sandpiper, sanderling, short-

billed dowitcher and dunlin. Biologists believe that a reduction in the number of horseshoe crab eggs available (a critical food source) has played a role in the declines. In 2016, more than half of red knots (56%) achieved an adequate weight at the time of departure, but only 28% reached sufficient weight in 2017 due to weather conditions that adversely impacted horseshoe crab spawning. Survival and productivity of Arctic breeding shorebirds like red knots depend on the maximum number of birds gaining enough weight to reach the polar region and begin to breed, living off their fat stores until the snows melt. As of this writing, the current population in Delaware Bay is less than 25% of its historic size.

Commitment to maintaining a low level of human disturbance so shorebirds can have an easier time finding and feeding on the limited amount of eggs, together with New Jersey's moratorium on harvesting horseshoe crabs for bait, have been critical to preventing further decline of the red knot population. In addition to these efforts, *Return the Favor*, a State and nonprofit collaborative initiative designed to reduce horseshoe crab losses and raise awareness on the importance of Delaware Bay to both crabs and shorebirds, continues. During FY17, volunteers combed the beaches to rescue tens of thousands of crabs that were overturned by waves or trapped behind bulkheads and other shore protection structures. Working at night, the crabs can safely be returned to the bay while avoiding any disturbance to the shorebirds using the beaches during the day.

Office of Fish and Wildlife Health and Forensics

Jan Lovy, Research Scientist

The Office of Fish and Wildlife Health and Forensics (OFWHF) conducts surveillance and research on diseases and chemical contaminants that affect New Jersey's fish and wildlife. Scientists in this office also recommend measures to combat diseases in the Division's fish hatcheries and in free-ranging fish and wildlife populations. These scientists are the only available experts in New Jersey State Government to specialize in wildlife pathology, fish pathology, and fish and wildlife toxicology. As a result, when fish and wildlife are dying in the Garden State, the public and other government agencies turn to the OFWHF to determine the cause and develop a response strategy.

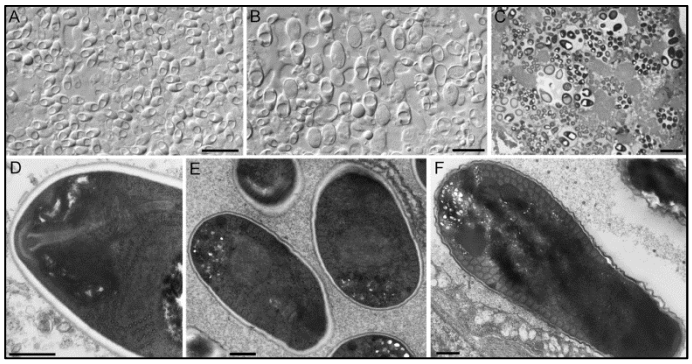
Highlights

Chronic wasting disease (CWD) continues to be a major health concern in white-tailed deer throughout the State. In 2016-2017, approximately 530 New Jersey-harvested deer were sampled for CWD by collecting and testing their lymph nodes for presence of the disease. The results indicate that New Jersey *remains* CWD-free.

Staff also conducted annual health inspections and disease monitoring at the Division's two fish hatcheries (Hackettstown and Pequest). A total of 570 fish of various species from both facilities were tested for pathogens and diseases of specific concern. Among the significant pathogens targeted in testing were viral diseases such as infectious pancreatic necrosis (IPN) and viral hemorrhagic septicemia (VHS), as well as bacterial diseases, including furunculosis and bacterial

kidney disease. In addition, testing included several parasitic diseases like whirling disease. Results from the testing showed *all* fish to be *free* of these major pathogens.

During FY16, a fish health survey of Assunpink Lake (Monmouth County) was conducted. Historically, the lake has succumbed to several spring fish kills in multiple species (particularly bluegill sunfish). Through their research, biologists discovered that one of the larger kills was caused by a bacterial infection (*Pseudomonas mandelii*). In addition, several fish were found heavily infected with intestinal parasites. The results were released for *early view* online in the April 2017 *Journal of Fish Diseases* and will soon become available to the public in print.



Microsporidian parasite discovered in bluegill sunfish. Images show various stages of the infectious parasite.

To further understand parasites that could be placing additional stressors on the fish in Assunpink Lake, a follow-up study was conducted. This year's survey discovered two new coccidian (intestinal) parasites that were highly prevalent in the spring, but not present in the fall. Future research will focus on characterizing these parasites and their seasonal impact on fish health. The study also confirmed the discovery of an unusual microsporidian parasite (a spore-forming type of fungi) infecting bluegill sunfish. Interestingly, this parasite displayed a unique relationship with another abundant parasite also found in the fish (*Posthodiplostomum minimum*). Though the microsporidian parasite caused little impact to the fish itself, it killed the *P. minimum* parasite that was present in the tissues. This unusual correlation was described for the first time and published for *early view* online in the June 2017 edition of *Parasitology*. These results are slated to become available in print shortly.

Efforts to monitor the health of marine fish populations continued. Several ongoing projects include VHS disease surveillance (which is currently *not* found in New Jersey), determining the health of summer flounder populations and understanding the prevalence of *mycobacteriosis* in striped bass. *Mycobacteriosis* is a chronic disease believed to kill adult fish and its impact on the entire population is still unknown.

Office of Environmental Review

Kelly Davis, Biologist

The Office of Environmental Review (OER) coordinates wildlife, marine fisheries, shellfisheries, freshwater fisheries and endangered species concerns related to state and federal permitting programs. The input provided protects, maintains and enhances fish and wildlife species and their habitats through environmental review of any development projects that could potentially cause negative impacts to these resources. Prior to construction, OER offers

guidelines to eliminate or minimize these impacts. Biologists also review and provide recommendations for the DEP's Land Use Regulation Program as well as the Bureau of Dam Safety and Flood Control, and the Solid and Hazardous Waste Program. In addition, OER offers input to federal agencies including the United States Army Corps of Engineers, Federal Energy Regulatory Commission, United States Department of Interior's Bureau of Ocean Energy Management, Federal Aviation Administration and the Department of Defense.

Highlights

During this reporting period, staff conducted a total of **327** environmental review assessments and attended **88** meetings on projects throughout the State.

Staff met with representatives from the U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, and National Marine Fisheries Service/National Oceanic Atmospheric Agency as well as representatives of the Tetra Tech, Inc. and Occidental Chemical Corporation to discuss a cleanup plan for an 8.3-mile stretch of the Passaic River. Discussions focused on winter flounder and other anadromous species (those that migrate up rivers from the ocean to reproduce) as well as timing restrictions to protect their spawning habits. Of major concern was the potential for a six-month closure that might increase costs and extend the clean-up effort by years, versus possible damage to the River's existing populations of river herring, American shad and winter flounder. Continued discussions will concentrate on evaluating habitat characteristics such as depth, salinity, water temperature and bottom substrates which could allow timing restrictions to be adjusted.

Photo depicts a thin layer application of dredge material on a New Jersey marsh.

Staff continues to meet with other DEP personnel and representatives of several federal agencies to update the dredging technical guidance manual, *Living Shorelines.* The Office of Environmental Review is responsible for providing all possible timing restrictions (with regard to fish and wildlife species) that can be applied to a dredging project or an associated plan to reuse the material removed during the dredging process. Discussions focused on purpose and need for restricted periods as well as possible mitigation measures that could reduce the need for closures.

Bureau of Information and Education

Al Ivany, Chief

The Bureau of Information and Education educates thousands of New Jerseyans on the needs and value of fish and wildlife. As more and more families choose to reside in formerly rural parts of the state, this type of education is critical if residents and wildlife are to successfully coexist together. To do this, staff interprets information on biology, ecology and conservation to help the public better understand the unique needs of each species as well as their economic, aesthetic, environmental and recreational values. Outreach efforts also promote the wise use of these resources and the need to safeguard them for future generations.

Highlights

The Bureau of Information and Education teamed up with the Bureau of Land Management to sponsor the Division of Fish and Wildlife's first annual *Military Appreciation Pheasant Hunt* for active duty military personnel, reservists and veterans on December 3, 2016. A total of 38 veterans were treated to a morning hunt for stocked pheasants on the Lenape Farms section of the Tuckahoe Wildlife Management Area in Atlantic County. Fourteen dog handlers were present with more than 20 dogs. Even though the weather was a bit windy, most participants were able to harvest a bird. Deemed an outstanding success, the program was met with rave reviews by all participants. They were extremely appreciative of the recognition of their military service and the opportunity to pheasant hunt over dogs. For many, it was their first time and several commented on the lasting memories that were made. Invaluable assistance was provided by the New Jersey Outdoor Alliance, New Jersey State Federation of Sportsmen's Clubs and Delaware Valley Chapter of the North American Versatile Hunting Dog Association as well as many volunteer hunter education instructors who contributed their time and energy to make this a special event. Based on the success of the hunt, the Division plans to make it an annual tradition to honor New Jersey's military active duty, reserve, and veterans for their dedicated service.

The Bureau is overseeing the development of a new Mobile Conservation Outreach Trailer to increase public awareness and educate residents on the beneficial partnership between the Division of Fish and Wildlife and the United States Fish and Wildlife Service's Wildlife and Sportfish Restoration program. A 24-foot enclosed trailer was purchased and will be outfitted by a professional exhibit design company. The mobile display will offer visitors a comprehensive view of the entire agency. Bureau staff members have organized a planning committee to work with the design group and hope to have it ready for unveiling at the WILD Outdoor Expo in September 2017.

DEP Commissioner Bob Martin (flanked by Division Director Larry Herrighty (L) and Assistant Commissioner Rich Boornazian) displays Governor Christie's proclamation.

The Division of Fish and Wildlife celebrated its 125th anniversary on March 8, 2017. Staff worked with the DEP Press Office to develop a feature news release to recognize the milestone as well as other outreach efforts, including the design of a commemorative anniversary logo, historical Facebook posts, listserv messages and web postings. The anniversary was also highlighted at Division special events. In addition, at the Division's annual Outdoor Writers Workshop on March 30, 2017 DEP Commissioner Bob Martin presented a proclamation from Governor Christie acknowledging the 125th anniversary. The proclamation also acknowledged March 8 as New Jersey Division of Fish and Wildlife Recognition Day.

Office of Mosquito Control Coordination
Scott C. Crans, Administrator

Created in 1974, the New Jersey State Mosquito Control Commission's Office of Mosquito Control Coordination (OMCC) is based in the Division's main office in Trenton. The OMCC coordinates programs funded by the State Mosquito Control Commission and serves as a public face on all State mosquito control matters. Actively collaborating with different bureaus in the Division and across DEP is a priority as well as maintaining existing standards and developing new methods of mosquito control. These efforts ensure that county-based mosquito control agencies across the State are improving the public's quality of life by reducing mosquito populations in an environmentally sound manner.

Highlights

During the summer, the Office of Mosquito Control Coordination continued to fund and oversee an ongoing collaboration between the New Jersey Department of Health's (DOH) Public Health and Environmental Laboratory, the Cape May County Department of Mosquito Control and the New Jersey Agricultural Experiment Station at Rutgers to test mosquito samples taken statewide for multiple viruses.

As part of DEP's Zika Initiative, public awareness activities were amplified along with direct State aid to counties. These efforts were designed to help prepare New Jersey for the possible arrival of Zika virus (ZIKV) as well as increase the capabilities to test for and control *Aedes albopictus*, a mosquito species that can transmit the virus (along with a host of others, including dengue, chikungunya and yellow fever). As a result, monitoring for disease in these mosquitoes was of the utmost importance this fiscal year. To date, no local mosquito driven transmission of

ZIKV has occurred in New Jersey. Travel-associated spread of the disease in humans remains the greatest risk.

Virus testing for West Nile Virus (WNV) on eight mosquito species in FY17 revealed the second lowest year for WNV activity since 2009 (426 positive samples out of 202,224 submitted for testing). Eleven samples tested positive for Eastern Equine Encephalitis Virus (EEEV) with unusual early activity in both mosquitoes and horses in the northern part of the State. Unfortunately, before season's end one human case of EEEV was confirmed that resulted in a fatality. Overall however, the EEEV levels detected were representative of previous years' results. Because of these circumstances, mosquito surveillance in this region was increased and will remain so throughout the upcoming season. With regard to testing for the Chikungunya and Dengue viruses, all of the samples analyzed were negative. This massive surveillance effort would not be possible without the dedicated work of county mosquito control agencies throughout the state along with invaluable assistance from the DOH in providing access to testing services.

A banded killifish, one of several freshwater species raised to supply county mosquito control agencies.

The OMCC continued to work in collaboration with the Division's Bureau of Freshwater Fisheries to supply multiple species of mosquito larvae-eating fish to county mosquito control agencies as part of the State's Integrated Mosquito Management Plan to help biologically control mosquito populations. This year's activities increased to meet the new challenges posed by the expected eventual emergence of ZIKV.

Office of Business Administration
Paulette Nelson, Assistant Director

The Office of Business Administration is responsible for the Division's licensing, accounting, budgeting, purchasing and billing functions. This office has three primary elements: *Licenses and Revenue*, *Permits*, and *Budget and Procurement*. These three sections work together to provide fiscal services for the Division. The following chart illustrates revenue, appropriations and expenses for FY17.

Purchasing licenses and permits is convenient and easier than ever before.

FY17 DFW ANNUAL REPORT

RESOURCES	
General State Fund Appropriation Hunters & Anglers	3,332,000
General State Fund Appropriation Shellfish and Marine Fisheries	2,282,000
General State Fund Appropriation Endangered Species	206,000
Subtotal GSF Appropriations	**5,820,000**
Hunters & Anglers Licenses/Permits	13,401,591
Lease Revenue	936,489
Endangered Species Revenue (License plates and Tax check-off)	333,032
Waterfowl Stamp Revenue	65,047
Miscellaneous Dedicated Accounts (Exotics, Sedge Island, Hooked on Fishing, Pump Out)	426,298
Shellfish and Marine Licenses/Permits	637,456
Subtotal Revenues	**15,799,913**
Federal Salary & Fringe Reimbursements	5,194,286
Federal Operating Funds	3,824,088
Carryforward funds from prior years - Recurring Non-Federal accounts	3,945,323
Non-Federal reimbursements and transfers	344,028
Subtotal Federal & Other funding	**13,307,725**
TOTAL RESOURCES	**34,927,638**

EXPENDITURES	
Hunters & Anglers Salaries (Includes seasonals, overtime, clothing allowances)	11,473,953
Shellfish and Marine Fisheries Salaries (Includes seasonals, overtime, clothing allowances)	2,923,391
Endangered Species Salaries (Includes seasonals, overtime, clothing allowances)	1,134,355
Hunters & Anglers Fringe Benefit costs assessed by Treasury Office of Management & Budget	5,964,186
Miscellaneous Dedicated Expenditures (Exotics, Sedge Island, Hooked on Fishing, Pump Out)	508,031
Waterfowl Stamp Expenditures	111,338
Hunters & Anglers Operating (equipment, repairs, fuel, utilities, licensing vendor…)	2,863,297
Shellfish and Marine Operating (equipment, repairs, fuel, utilities...)	496,814
ENSP Operating (equipment, repairs, fuel, utilities...)	164,167
Federal Operating Expenditures	3,824,088
DEP Assessments (Deputy Attorney General's Office, Office of Information Resources Management, Office of Administrative Law, Environmental Research Library, Office of Information Technology, Rent, Training Office)	602,070
TOTAL EXPENDITURES	**30,065,690**
***BALANCE**	**4,861,948**

*Reflected balance includes funds in recurring Non-Federal accounts dedicated for specific purposes. It is anticipated that a portion of the remaining balance will be needed for retroactive salary, fringe and clothing payments when employee contracts are settled. Information as of 8/17/17.