

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

WATERFOWL PERMIT PROGRAM

2005-2006 ANNUAL REPORT

Abstract: Florida is visited by more than 20 species of migratory waterfowl each year. Four species of ducks regularly nest in the state during spring and summer. Waterfowl provide significant economic and recreational benefits to the citizens of Florida. This report documents efforts by the Florida Fish and Wildlife Conservation Commission (FWC) to manage Florida's waterfowl during fiscal year 2005-06.

Waterfowl management activities fall into two categories: population monitoring and habitat management. The Waterfowl Management Program (WMP) coordinated the banding of 689 mottled ducks and 427 wood ducks during 2005. Mottled ducks and wood ducks were captured at bait sites and by night-lighting. Reports of band encounters allow us to identify hunting pressure on these ducks. Hunters can dial 1-800-327-BAND (inscribed on the band) or visit www.pwrc.usgs.gov/BBL/ to report band information.

A main concern for mottled duck conservation is hybridization between introduced domestic mallards and mottled ducks. The resulting genetic swamping of mottled ducks by mallards could lead to the loss of Florida's mottled duck as a distinct species. The WMP devoted substantial effort to this problem in 2005-06.

Providing appropriate waterfowl hunting opportunities for Florida's citizens is a primary mission of the WMP. Hunting seasons are established in Florida to maximize hunter opportunity within the constraints of sound resource stewardship and guidelines mandated by the U.S. Fish and Wildlife Service (USFWS). The WMP participated in the national process for setting waterfowl hunting regulations and developed recommendations for the FWC Commission concerning appropriate regulations in Florida.

Habitat management allows us to improve the habitat quality and quantity necessary to support Florida's waterfowl and other wetland wildlife. Waterfowl biologists provided technical assistance on wetland conservation and management issues around the state. We worked with many agencies, organizations, and private landowners to cooperatively manage wetlands.

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

WATERFOWL PERMIT PROGRAM

2005-2006 ANNUAL REPORT

Waterfowl are among the most recognized and economically important wild animals in North America. In Florida, naturalists, bird watchers, and hunters spend countless hours enjoying these birds. As human impact on the environment has increased, negative impacts on waterfowl populations also have increased. The Florida Fish and Wildlife Conservation Commission's (FWC) Waterfowl Management Program (WMP), a part of the Division of Hunting and Game Management, is charged with ensuring the continued well-being of these popular birds.

The passage of the Florida Duck Stamp Act in 1979 created the WMP and provided a mechanism for funding. This act requires that all Florida waterfowl hunters purchase a three-dollar waterfowl permit. The proceeds are devoted to management of Florida's waterfowl resource. In 2005-06, 11,384 waterfowl permits were sold. Sportsman's licenses also include a waterfowl permit, and 26,647 of these licenses were sold. Revenue from waterfowl permits and sportsman's licenses totaled \$116,898. Consistent with legislative provisions, 5% of this revenue was expended on administration, 25% on waterfowl research, and 70% on waterfowl management. These expenditures represented 21% of the \$572,986 that was spent on waterfowl administration, research, and management.

During 2005-06, the WMP continued its efforts to increase public awareness of Florida's waterfowl resource through a web site, Florida's Waterfowl (www.MyFWC.com/duck). The web site provides information on Florida's resident and migrant waterfowl, habitat conservation, and waterfowl hunting, as well as results from waterfowl population surveys in Florida and links to other sites of interest to waterfowl enthusiasts.

The WMP worked cooperatively during the year with three important stakeholder groups, Ducks Unlimited (DU), Delta Waterfowl (Delta), and United Waterfowlers of Florida (UW-F). UW-F is an organization dedicated to representing the interests of Florida's waterfowl hunters. WMP activities with these groups included coordinating cooperative projects and providing technical assistance on issues of mutual interest. WMP staff participated in the annual state DU convention in Ocala in May 2006. More than 100 DU members participated in the convention. Waterfowl biologists also contributed several articles for DU's state newsletters.

In May 2006, FWC's Waterfowl Management Standing Team began developing a

strategic plan to guide future waterfowl management by FWC. The team should complete a draft of the plan in May 2007.

Waterfowl management programs are best understood if grouped biologically. Florida wetlands support breeding (resident) and migrant (wintering) waterfowl, and our management targets the populations and habitats of these birds.

POPULATION AND HABITAT MANAGEMENT

Population monitoring allows us to track the number of ducks over time. Annual population estimates and other population parameters help us manage for maximum hunting opportunity while sustaining healthy waterfowl populations. Moreover, accurate population information provides a basis for directing waterfowl conservation efforts where they are most needed and effective.

Habitat management helps us provide the greatest quantity and highest quality habitat possible to support Florida's waterfowl and other wetland-dependant wildlife. Without a large habitat base that includes breeding, migration, and wintering areas, waterfowl populations will decline. Habitat management and conservation have importance beyond their value to waterfowl because wetlands benefit many other plant and wildlife species.

Two external programs enhance FWC's ability to conserve and manage wetland habitat for both resident and migratory waterfowl. DU's Matching Aid to Restore States' Habitat (MARSH) program provides matching money to help states acquire and enhance wetland habitat. Our matching funds for MARSH projects in Florida are budgeted through the legislature. Since this program's inception, FWC's MARSH projects have helped restore and enhance more than 16,000 acres of wetland habitat in Florida.

Florida is part of the Atlantic Coast Joint Venture (ACJV) of the North American Waterfowl Management Plan (Plan). This joint venture, among others, serves to implement wetland habitat management objectives and establish and maintain waterfowl population goals identified in the Plan. Joint ventures create partnerships to plan, fund, and implement wetland habitat projects within their respective geographic areas. ACJV partnerships will provide substantial benefits to Florida's fish and wildlife resources. The WMP provides input on ACJV activities in Florida.

RESIDENT SPECIES

The four species of ducks that regularly breed in Florida are the mottled duck, wood duck, fulvous whistling duck, and black-bellied whistling duck. All four species nest during

spring and summer. Mottled ducks remain in Florida throughout the year. Many wood ducks and fulvous whistling ducks remain year-round as well, but some of these birds migrate from Florida for part of the year. Black-bellied whistling ducks also occur in Florida year-round, but we have no information on seasonal movement patterns. Conservation plans for wood ducks, fulvous whistling ducks, and black-bellied whistling ducks are being developed. Current management for mottled ducks is guided by FWC's "A Conservation Plan for the Florida Mottled Duck 2004-2009."

Florida's Mottled Duck

The Florida mottled duck is one of approximately 25 closely related, mallard-type species worldwide. This subspecies occurs only in Florida and does not migrate from the state; therefore, management and protection of Florida's mottled ducks are primarily the responsibilities of the State of Florida. Hunters favor this bird because of its large size and palatability. Florida hunters harvested an estimated 10,504 mottled ducks in 2005-06, which accounted for approximately 6% of the statewide harvest of ducks. We remain concerned about the long-term status of Florida's mottled duck population throughout its range because low recruitment and survival have been documented, important habitat in Florida continues to be altered or lost, and hybridization with feral mallards continues. Because of these concerns, the conservative daily bag limit for the harvest of this species remains at one.

Mottled Duck Population Monitoring and Management. -- Mottled duck population monitoring includes banding and a March aerial survey of the breeding population. During the summer of 2005, 689 mottled ducks were captured and marked with leg bands. Over the past 10 years, 4,576 mottled ducks have been banded (Figure 1). Banding data are periodically analyzed to estimate annual survival rates and the proportion of the population that is harvested, as well as to monitor movements.

The March breeding population survey has been conducted since 1985, and waterfowl biologists have been evaluating a new survey method since 2003. Results from the 2006 survey using the new survey methodology indicated that the mottled duck density within the central region of the mottled duck range was 0.87 birds per square kilometer of wetland habitat, or 11,643 birds in an area the size to the original survey region. A large increase in the cost of helicopter flight time resulted in a budget shortfall. Thus, only the central and north regions of the survey were completed in 2006.

Although problems with helicopter availability prevented us from surveying the entire area (i.e., all three regions) in the same year, the pilot surveys conducted from 2003 through 2006

provided the data necessary to determine the feasibility of the new survey and refine the design. Biologists are now confident that mottled ducks can be reliably monitored using point-transect sampling from a helicopter. Mottled ducks lend themselves to this sampling method because they do not move quickly away from the approaching aircraft and can be detected at distances of up to 600 meters. Also, it appears that a survey effort of approximately 600 total survey points will provide a reasonably precise density estimate for the new survey area, and this number of points can be surveyed within an acceptable amount of time (approximately 60 hours of flight time), assuming helicopters are available. Over the past four years, we have used several contractors to supply helicopters and pilots for this project. As a result, we have identified a few reputable and reliable contractors. If we can use these contractors for future surveys, we expect fewer problems with helicopter availability than we have experienced in past years.

The original transect survey provided reasonably precise density estimates (mean Standard Error 1984-2003 = 0.13) for the original survey area. Data collected from the central (March 2006), north (March 2006), and south (March 2004) regions, when combined, provide a similarly precise density estimate for the new survey area (SE = 0.16). Moreover, when the data were combined, the population estimate obtained for the new survey area was very similar to a population estimate previously published for Florida mottled ducks. Lastly, the four density estimates (2003-2006) obtained for the central region (Fig. 3) were within the range of those obtained from the old survey design, even though the new survey was not designed to obtain estimates from such a small area. These favorable comparisons give some corroboration to the new technique.

Based on these results, the new design appears feasible both logistically and with regard to providing the data needed to monitor the status of the mottled duck population in Florida. A goal in redesigning this survey was to generate an estimate with a similar level of precision as was obtained from the original survey, but for a larger area that was representative of the entire range of the mottled duck in Florida. It appears we have met this goal. Another goal was to increase the efficiency of the survey. We believe we have achieved this as well. In fact, there are three important benefits this survey design provides as compared to the old design. First, point-transect methods allow us to efficiently collect accurate data from all types of mottled duck habitat throughout their range including urban/suburban areas. Second, point-transect sampling is less stressful on observers and utilizes direct distance measurements. As a result, more accurate data can be collected and more flexible analysis employed. Perhaps most importantly, this design is safer for the participants in that much less time is spent flying at low altitudes and slow speeds. Based on our logistical experiences over the past four years and on the results

obtained from the data collected, it is recommended that point-transect methods be employed and the revised design become operational in all future mottled duck surveys because having a reliable population index is critical to conserving this subspecies.

Mottled Duck Habitat Management. -- The WMP continued efforts to develop the Mottled Duck Production Area (MDPA), a 1,400-acre, state-owned tract in Highlands County. The greatest density of nesting mottled ducks occurs in prairie habitats on the Florida peninsula. These habitats are used extensively for cattle ranching and other agriculture, which are an important part of Florida's economy. Therefore, the MDPA will be used primarily as a research area to identify grazing schemes that optimize mottled duck nesting and brood-rearing conditions, while being viable within a cattle ranching operation. We continue to work cooperatively with Mr. Matt Pearce of Rock Hill Ranch in Okeechobee to graze cattle on the MDPA. We continue to investigate the effects of continuous and rotational beef-cattle grazing on mottled duck habitat and assess plant community dynamics resulting from grazing management scenarios. Vegetation sampling began in May 2003 and will continue through 2007. Our hope is that the area will provide a demonstration site to inform and educate the public on the relationships between cattle grazing and mottled ducks in southern Florida. The MDPA is a DU MARSH project.

Mottled Duck Conservation. -- Waterfowl biologists completed the data-collection portion of a study of habitat use, survival, and movements of Florida mottled duck females in the Upper St. Johns River Basin (USJRB) in 2003. A manuscript entitled "Survival and Cause-Specific Mortality of Adult Female Mottled Ducks in East-Central Florida" was published in June 2006 in the *Wildlife Society Bulletin*. An additional manuscript entitled "Habitat Use and Movements of Adult Female Mottled Ducks in East-Central Florida" is being modified and will be submitted to the *Wildlife Society Bulletin* during 2007. Staff continued to seek funding for a second phase of this research, which would take place in the Everglades Agricultural Area.

The FWC's overall plan for attacking the mallard x mottled duck hybridization problem has three objectives: (1) develop techniques to identify hybrids, (2) assess the proportion and distribution of hybrids in the mottled duck population, and (3) identify and implement mechanisms to reduce hybridization. Relative to the first two objectives, FWC waterfowl biologists completed work developing a genetic method of identifying mallard x mottled duck hybrids. During FY 2004-05, FWC biologists and Boston University researchers completed their initial work on the development of a technique to identify hybrids. This effort resulted in the identification of six genetic markers that provide a composite genetic fingerprint for mottled

ducks and feral mallards in Florida. Using this composite fingerprint, researchers estimated that between seven and 12 percent of the Florida mottled duck population was of hybrid origin. This is a significant proportion and indicates a serious hybridization problem, which, if not quelled, could result in the extinction of the Florida mottled duck. During FY 2005-06, we extended the previous genetic study and were successful in identifying six additional genetic markers thus greatly refining our ability to identify not only first-generation crosses, but also multi-generational hybrids. Work on the development of a written key or field guide to identifying hybrids by plumage and structural characteristics will begin in FY 2006-07. If successful, the key could eliminate much of the need for costly genetic analyses. Future genetics work aimed at developing a historical genetic profile for mottled ducks is still planned and will be initiated when funding becomes available. This historical genetic profile is needed before long-term monitoring of the rate of mallard genetic introgression into the mottled duck population can begin. When this work is complete, periodic monitoring will be initiated during which the current genetic profile for mottled ducks will be compared to the historic profile to determine the rate at which the profile is changing. This appears to be the best way to monitor the ingress of mallard genes into the mottled duck population and monitor the effectiveness of efforts to stop hybridization.

We continued progress on the third objective, that is, to identify and implement mechanisms to reduce hybridization. We believe that the most important strategy for reducing hybridization is an education/communication program. FWC's efforts on this front focus on maximizing awareness of the issue and effectiveness of the message, based on the assumption that available funding will be minimal. Strategies are to (1) reduce the sale and subsequent release of mallards, (2) gain wider acceptance for reduction of the mallard population, and (3) create an awareness of the problem among identified stakeholders. In 2005-06, we continued to develop and distribute informational material, make presentations and contacts to groups and organizations, and coordinate media coverage. We sent mailings to more than 8,000 community association managers informing them about the hybridization problem, urging them to not release mallards, and informing them of control options available. A narrated PowerPoint presentation on the subject was developed and made available on the website. The intended audiences are community and civic groups and homeowners associations. A new, 2006, edition of the occasional newsletter, "Florida Mottled Duck Update," was prepared and distributed through mailings, handouts, and on the website. We will continue to implement plans to address the hybridization problem and work toward accomplishing the identified tasks, as resources allow.

In April 2006, several members of the Waterfowl Management Standing Team

participated in a mottled duck workshop held in Lafayette, LA at the National Wetlands Research Center. The purpose of the workshop was to review the population status, distribution, vital rates, and habitat requirements of mottled ducks and discuss appropriate harvest and habitat management frameworks. Members of the Florida contingent presented several talks relevant to these topics and interjected a Florida perspective into all discussions.

Wood Duck

Wood ducks are perhaps the most beautiful duck in North America and are admired by people throughout the state. The most abundant resident duck species of Florida, wood ducks also are highly valued by Florida hunters. Wood ducks ranked sixth in hunters' bags and made up approximately 5% of the total duck harvest in Florida in 2005-06. The USFWS estimated that 8,200 wood ducks were harvested in Florida during the 2005-06 September and regular duck hunting seasons.

Wood Duck Population Management. -- Wood ducks inhabit wooded, brushy, or other vegetated wetland areas. Therefore, unlike other duck species, wood ducks cannot be counted reliably during aerial surveys. Consequently, populations have been monitored through banding, experimental monitoring of nest boxes, and harvest surveys. These efforts have been critical to continuing the special September duck season for Florida's hunters.

In 2005, WMP coordinated the banding of 427 wood ducks prior to the hunting season. A total of 4,881 wood ducks have been banded over the past 10 years (Figure 1). This effort in 2005 was aided by a grant of approximately \$10,000 from the USFWS, which funded the hiring of a seasonal technician and other costs associated with wood duck banding. Information from band recoveries indicates that hunting pressure on Florida's wood ducks is lower than for wood ducks in other Atlantic Flyway states. Previous analysis of banding data indicated that a high proportion of wood ducks banded during the summer in Florida that are harvested by hunters are taken within the state. This information supports increased opportunity for hunting Florida's wood ducks.

Estimates of hunter effort and harvest are used to help determine whether the extra harvest allowed by the special September duck season in Florida is compatible with the well-being of Florida's wood duck population. The USFWS estimated that hunters harvested 1,700 wood ducks and 7,900 teal in Florida during this special season in 2005. Previous work by the WMP indicated that Florida's wood ducks have been harvested at a low rate, reproduction of wood ducks in Florida has been typical for the species and higher than for other duck species, and the population growth rate for females in Florida was not statistically different from that of a stable population. No evidence was found to suggest the September season was causing negative effects on wood duck populations.

Wood Duck Habitat Management. -- Wood ducks are cavity nesters. Many areas with adequate brood-rearing habitat do not contain trees large enough to have suitable nesting cavities. However, man-made nest boxes can provide nest sites. WMP biologists and other FWC staff maintained nest boxes existing on Wildlife Management Areas (WMA's) and other

public water bodies. WMP personnel provided technical assistance to private citizens, government agencies, and groups such as local DU chapters and Boy Scout troops to erect and maintain nest boxes.

Fulvous and Black-bellied Whistling Ducks

The whistling ducks are more closely related to geese than to ducks. Fulvous whistling ducks have separate populations in Asia, Africa, Madagascar, South America, and North America. Prior to about 30 years ago, neither species of whistling ducks nested in Florida. Today, nesting fulvous whistling ducks are abundant in South Florida where rice is grown. In winter, many fly south, apparently to Cuba. Florida's black-bellied whistling duck population seems to have increased dramatically in recent years, and reports of successful breeding exist from many areas of the state.

Whistling Duck Population Management. -- Lack of funds and personnel has prevented the WMP from extensively studying and managing these ducks. Since 1994, about 63 fulvous whistling ducks have been banded in Florida.

Whistling Duck Habitat Management. -- To promote good management for fulvous whistling ducks and black-bellied whistling ducks, the WMP encourages shallow flooding of fallow agricultural fields and rice culture in place of sugar cane.

MIGRATORY WATERFOWL

This large group includes waterfowl that breed in northern North America and migrate to Florida during the fall and winter. Approximately 20 species of waterfowl regularly spend the winter in Florida, and the migratory ducks constitute at least 80% of all waterfowl harvested by Florida hunters. Resident waterfowl species compose the remaining 20%. The estimated duck harvest in Florida during the 2005-06 hunting seasons totaled 174,700 birds. This harvest is an 18% increase over the 2004-05 season (148,300) and similar to the 1981-90 average of 181,000.

Habitat in wintering areas, such as Florida, is important in the annual cycle of migratory waterfowl. Habitat conditions during this non-breeding period influence survival and subsequent reproduction. Ducks must maintain or improve their body condition during winter to avoid mortality during the spring migration and to meet the physiological demands of the nesting season (i.e., egg laying, incubation). The WMP devotes considerable resources to monitoring and managing these migrant birds and providing quality habitat.

Migrant Waterfowl Population Management

Ring-necked ducks are particularly important in Florida because they constitute a large proportion of the state's annual waterfowl harvest. A majority of the ring-necked ducks in the Atlantic Flyway spend the winter in Florida, and, on average, approximately 66% of ring-necked ducks harvested in the flyway are harvested here. The WMP provides funding for cooperative banding efforts in Canada and remains vigilant in encouraging Canadian waterfowl managers to continue banding ring-necked ducks on the breeding grounds. These efforts are important for justifying continued harvest opportunities for this species.

Florida participates in international waterfowl management by sending FWC representatives to serve on the Atlantic Flyway Council and its Technical Section as voting members. Representatives from 17 states and six Canadian provinces participate. This council coordinates international research, monitoring, and management in the flyway and makes recommendations to the USFWS concerning appropriate waterfowl hunting seasons. The WMP coordinator is Florida's technical representative, serves as the chair of the Technical Section, and also represents the Atlantic Flyway on a national technical working group tasked with developing Adaptive Management procedures for waterfowl harvest management. The Adaptive Harvest Management Working Group is composed of two representatives from each administrative flyway and biologists from the USFWS. Two FWC waterfowl management staff members participated in the Atlantic Flyway's 2006 Wing Bee. At the Wing Bee, which is part of the USFWS's annual harvest survey, biologists examine a sample of wings from harvested waterfowl to estimate composition of the harvest with respect to species, age, and sex. Florida participates in several other cooperative flyway projects, helping to ensure that Florida's waterfowl enthusiasts continue to have access to this valuable resource.

Providing appropriate waterfowl hunting opportunities for Florida's citizens is a primary mission of the WMP. Hunting seasons are established in Florida to maximize hunter opportunity within the constraints of sound resource stewardship and guidelines mandated by the USFWS. The WMP develops recommendations for the FWC Commission concerning appropriate waterfowl hunting regulations in Florida.

Waterfowl staff participated in workshops in the fall to encourage participation in duck hunting. Workshop topics included how and where to hunt ducks in Florida, duck identification, and hunter ethics. Workshops were held in Ocala and Sebastian. Unfortunately attendance was low at the Ocala workshop as a result of hurricane activity, and the Sebastian workshop was attended by approximately 45 participants.

Migrant Waterfowl Habitat Management

Florida lost approximately 260,000 acres of freshwater, emergent wetlands between 1985 and 1996. This habitat type is essential for waterfowl, yet losses continue. Waterfowl management staff manages habitat through technical assistance to various agencies, groups, and individuals (Table 1) and through administration of public waterfowl areas. Not all technical assistance produces a tangible increase in waterfowl habitat, but this input does cause the welfare of wetlands and associated wildlife to be considered when resource management decisions are made. As a result, waterfowl habitat in the state is conserved and enhanced.

Staff continued to consider and investigate areas for potential DU MARSH projects as well as other partnerships for wetland conservation and enhancement. These included several Commission managed lands (Apalachicola and CREW Wildlife and Environmental Areas, Lake Wales Ridge and Box-R Wildlife Management Areas, and Teneroc Fish Management Area) and St. Vincent National Wildlife Refuge, Hooker's Prairie, Banjo Grove, Cow Pen Lake, Wadsworth Wetlands, White Oak Conservation Center, and River Ranch. Staff is also involved in several on-going planning efforts as they relate to restoring and enhancing water level regulation for Lakes Istokpoga, Okeechobee, Tohopekaliga, Cypress, Hatchineha, and Kissimmee. Furthermore, staff participated in a public workshop sponsored by the FWC, University of Florida – IFAS, and the Potash Corporation designed to provide and disseminate information on various landowner incentive programs, including those that assist landowners with wetland improvements. WMP staff participated in FWC teams responsible for coordinating (1) management of fish and wildlife habitat on the Kissimmee Chain of Lakes, (2) the use of triploid grass carp for aquatic plant management to improve fish and wildlife habitat, and (3) management of Lake Lafayette.

DU, with assistance from the FWC, completed the structural upgrade of Hickory Mound Impoundment (HMI), in Taylor County in June 2006. Hickory Mound Impoundment is part of the Big Bend Wildlife Management Area. The structural upgrade included refurbishing the levee, installing two 1000-ft. spillways, and replacing the culverts controlling water exchange between the impoundment and the Gulf of Mexico. DU (the project manager) contracted with Carter Construction for the upgrade. Additionally, DU prepared a draft wetland management plan for HMI. This plan will be reviewed by Commission staff and presented to the Florida Subcommittee on Managed Marshes during the fall 2006 Subcommittee Meeting, followed by an on-site visit.

T. M. Goodwin Waterfowl Management Area. -- This 6,300-acre area in the upper St. Johns River Basin continues to provide important habitat for migrating, wintering, and resident

waterfowl and other wetland-dependent wildlife, as a result of intensive management. The WMA is composed of two management units: T. M. Goodwin (Goodwin) and Broadmoor Marsh (Broadmoor).

The 2005-06 waterfowl hunting season provided for 1,556 hunter-trips, during which hunters harvested 4,593 ducks, for an average of 3.0 ducks per hunter-trip. Blue- and green-winged teal made up the majority of ducks harvested. Additional species included mottled ducks, black-bellied whistling ducks, northern pintail, ring-necked ducks, wigeon, and others. A youth waterfowl hunt occurred on February 4, 2006, followed by three days of snipe hunting on February 7, 11, and 14. Other public use activities included scouting/observing, bird watching, biking, hiking, and fishing.

Management during the year included enhancing approximately 1,500 acres of wetland habitat by disking, roller chopping, prescribed burning of approximately 1,950 acres, and using water level manipulations to encourage native plant growth. Routine maintenance included levee repairs (e.g., filling in low sections, reshaping and regrading), maintaining parking areas and other public use facilities, and mowing approximately 35 miles of levees. Additional maintenance at Broadmoor included rebuilding one of the electric pumps. Contractors treated with herbicide approximately 580 acres of para grass in selected impoundments at Goodwin and Broadmoor. Herbicide was applied aerially with a helicopter, and all herbicide treatments were effective in controlling the targeted exotic plants. In addition, approximately 400 acres of hyacinths were treated.

Other activities included completion of a three-year cooperative research project with the University of Florida. This research project examined wetland management techniques for controlling para grass on the T. M. Goodwin Waterfowl Management Area. Para grass is an invasive exotic species originally introduced into Florida as a pasture grass. This species is compromising management efforts on the Goodwin area as well as on other restored or managed marshes in Florida. Para grass out-competes the native wetland vegetation that is more desirable as wildlife habitat. Preliminary project results have been encouraging, and management treatments show promise of being effective. A combination of herbicide and cattle grazing seems to increase plant interspersions and diversity, which is a desired outcome. This project has been partially funded by three one-year grants to the WMP from the Wildlife Foundation of Florida.

PROGRAM DIRECTION AND NEEDS

Florida's WMP has been in existence for more than 20 years. Our challenge has been

large and our resources limited. During this time, we have made substantial contributions to the knowledge and habitat base needed to manage and sustain waterfowl in Florida and internationally. Our population monitoring efforts yield information necessary for management. Informing the public is an important part of our efforts to ensure the well-being of the waterfowl resource (Table 2). We believe the biggest opportunity to reduce the hybridization threat to mottled ducks by feral mallards is through public education and marketing of the message. The extent to which we are able to accomplish this is substantially limited by funding.

Our challenge for the future is to continue population monitoring and management, while using up-to-date information to increase involvement in habitat issues. Coordinating activities between the WMP and other entities involved in habitat and conservation issues will remain a challenge. Continued funding of the DU MARSH program is still vital. However, this program is intended only for acquisition and development of habitat projects. Additional funding is necessary to operate and maintain these and any other new waterfowl habitat projects after they are developed.

Table 1. Partial list of entities that received technical assistance from waterfowl personnel during fiscal year 2005-06.

Florida State Agencies

Florida Fish and Wildlife Conservation Commission
 Division of Habitat and Species Conservation
 Division of Freshwater Fisheries Management
 Division of Law Enforcement
 Office of Community Relations
 Fish and Wildlife Research Institute
Department of Environmental Protection
South Florida Water Management District
Southwest Florida Water Management District
St. Johns River Water Management District
Suwannee River Water Management District
Florida Department of Agriculture and Consumer Services
Florida Department of Health

Other State or Provincial Agencies

South Carolina Department of Natural Resources
Georgia Department of Natural Resources
Louisiana Department of Wildlife and Fisheries
Texas Parks and Wildlife Department

Federal Agencies

U. S. Department of Agriculture--Wildlife Services
U. S. Fish and Wildlife Service
Natural Resource Conservation Service (NRCS)
U.S. Park Service--Gulf Island National Seashore
U.S. Army Corps of Engineers
National Oceanographic and Atmospheric Association
U. S. Geological Survey
National Wetlands Research Center
U.S. Forest Service

Local Government

Hardee, Taylor, Brevard, and Leon counties
Brevard County Public Schools
Indian River County Public Schools
City of Jacksonville's Preservation System

Universities and High Schools

University of Florida, Institute of Food and Agricultural Services
University of Florida, Department of Wildlife Ecology and Conservation
University of Georgia
Northeastern University
Louisiana State University

Non-governmental Organizations

Ducks Unlimited Inc., state chapter, and various local chapters
United Waterfowlers – Florida

Table 1, continued. Partial list of entities that received technical assistance from waterfowl personnel during fiscal year 2005-06.

Non-governmental Organizations (continued)

National Wildlife Federation

Boy Scouts of America

North American Wetlands Conservation Council

Space Coast Audubon Society

Space Coast Birding and Wildlife Festival

Delta Waterfowl

Wildlife Management Institute

Wildlife Forever

Lake McBride Homeowners Association

Businesses

Phosphate companies

Deseret Ranch

White Oak Plantation

Mosaic Fertilizer LLC

Walt Disney World Corporation

Anheuser-Busch Corporation

Montalbano and Company – Consulting Biologists, LLC

St. Joe Land Development Company

Citizens

(numerous)

Table 2. List of waterfowl management reports and publications, 2005-06.

Bielefeld, R. R. 2005. Is it, or is it not, a mottled duck? – The answer is in the genes. Ducks Unlimited Wingbeats. Fall 2005.

Bielefeld, R. R. 2006. Mottled duck survey redesign final report. Unpublished report. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida, USA.

Bielefeld, R. R., and R. T. Cox, Jr. 2006. Survival and cause-specific mortality of adult female mottled ducks in east-central Florida. Wildlife Society Bulletin 34:388-394.

Eggeman, D. R. 2005. Mallard banding on shooting preserves. Ducks Unlimited Wingbeats. Fall 2005.

Fanning, A. T. 2006. Evaluation of waterfowl habitat on Lake McBride, Leon County, Fla. Unpublished report. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida, USA.

Feddersen, J. C. 2006. Waterfowl harvest surveys: thousands participate annually. Ducks Unlimited Wingbeats. Spring 2006.

Florida Fish and Wildlife Conservation Commission. 2005. Waterfowl permit program -- 2004-05 annual report. Unpublished report. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida, USA.

Florida Fish and Wildlife Conservation Commission. 2006. Florida mottled duck update, 2006 edition. Occasional newsletter. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida, USA.

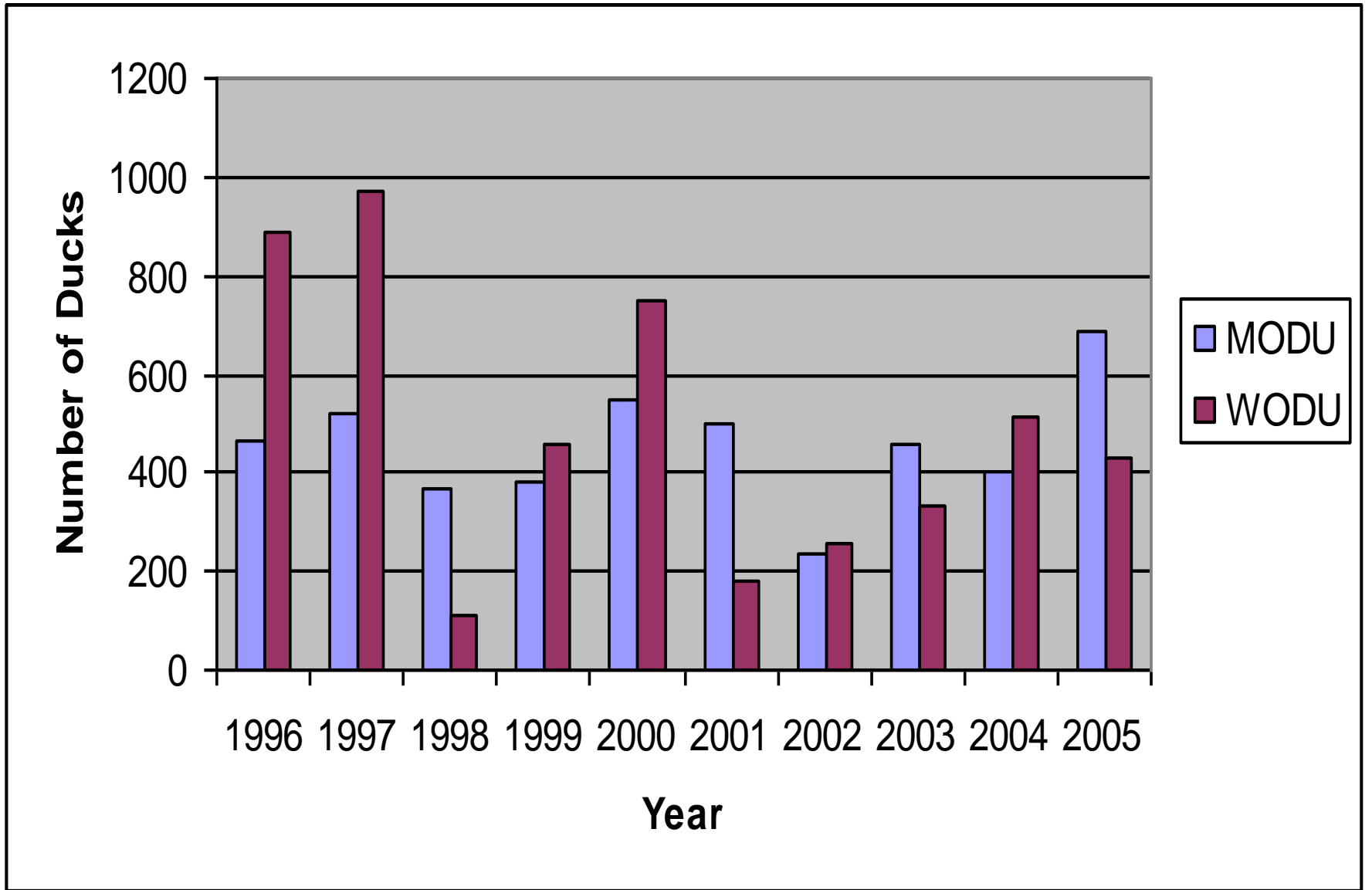


Figure 1. Numbers of Florida mottled ducks (MODU) and wood ducks (WODU) banded statewide by FWC staff, 1996-2005.