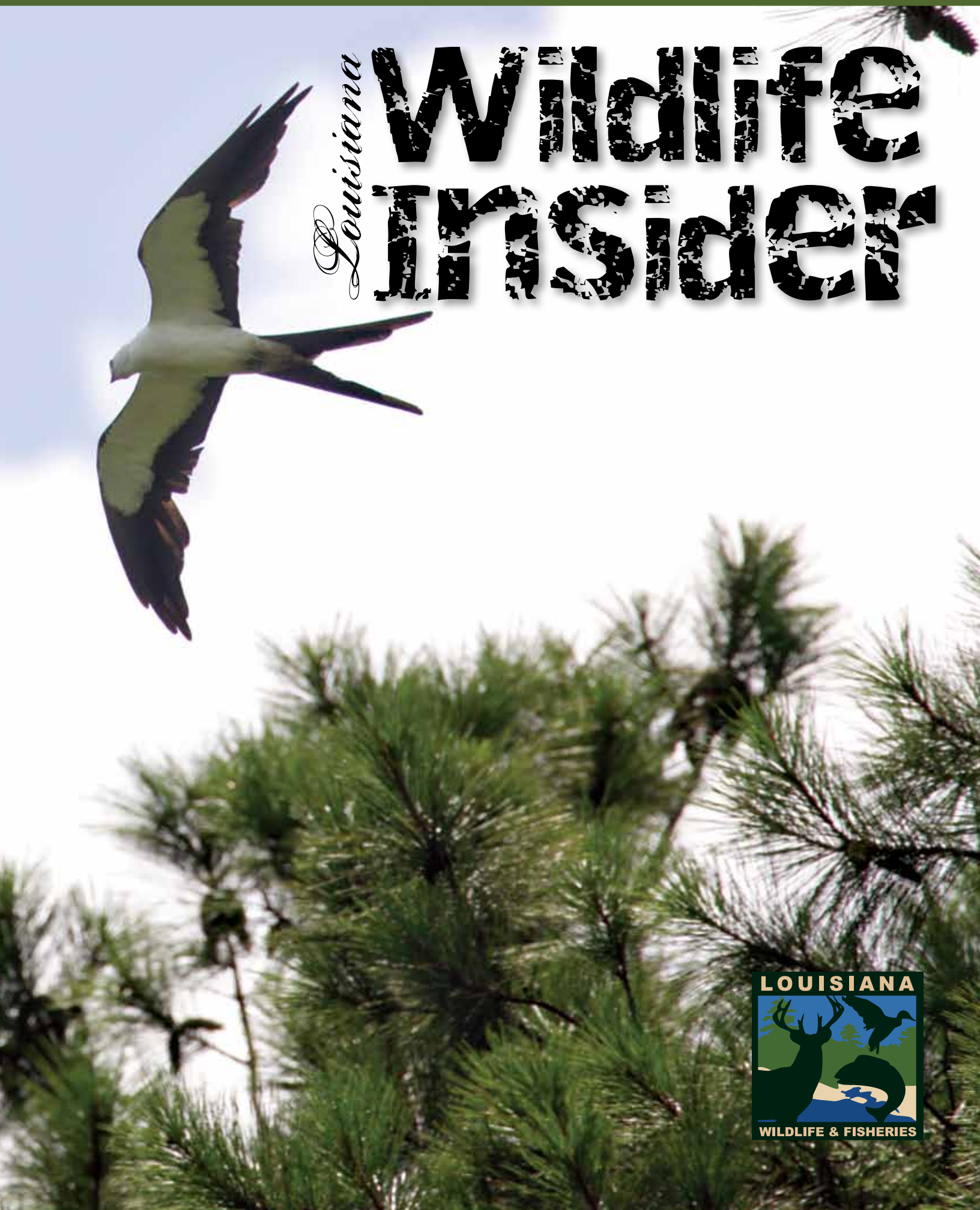
Winter 2010

# Louisiana Wildlife Insider



LOUISIANA WILDLIFE & FISHERIES

# Excuse me, am I bothering you?

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## Office of Wildlife Overview

The Louisiana Department of Wildlife and Fisheries' strategic plan states that, "*The purpose of the Office of Wildlife Program is to provide wise stewardship of the state's wildlife and habitats, to maintain biodiversity, including plant and animal species of special concern, and to provide outdoor opportunities and education for present and future generations to engender a greater appreciation of the natural environment.*" The Office of Wildlife is comprised of two divisions, Coastal and Non-game Resources (formerly Fur and Refuge) and Wildlife divisions. As the name implies, the Coastal and Non-game Resources Division is largely oriented toward coastal resources, the exception being its role in non-game management. Wildlife Division has statewide responsibilities, but its public lands program is predominantly outside of the costal zone. Given such a broad mission, it is logical that a wide range of research and management work is conducted in order to maintain healthy, productive populations of wildlife and provide recreational opportunities for citizens to enjoy these species. Staff biologists gather data on birds and animals for use in formulating harvest regulations and development of habitat management recommendations. They develop workshops for LDWF and other agencies' personnel and present seminars to the public. In addition, the staff represents LDWF on state, regional and national committees, providing wildlife input to a wide array of public agencies, non-governmental organizations (NGOs) and private industry. Coastal and Non-game Resources Division's major programs are Alligator Management and Research, Fur and Marsh Management, Habitat Conservation (including Scenic Streams & Environmental Investigations, Natural Heritage, and Mineral, Permit and Mitigation), Coastal Operations, Rockefeller Refuge, and White Lake. This newsletter focuses on aspects of some of these programs and provides follow-up for Wildlife Division programs introduced in the first newsletter. Future newsletters will focus on species, habitat and private lands management.

**Cover/Back Photo courtesy of John Owens. Two swallow-tailed kites soaring through the air. Story on page 24.**

Photo courtesy of USFWS

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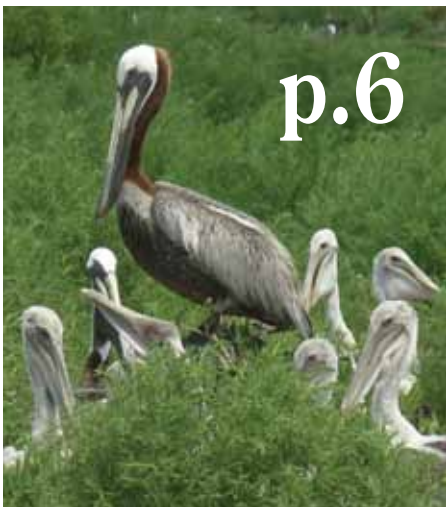


# Alligator Management Program

The Louisiana Department of Wildlife and Fisheries (LDWF) has developed wise management programs for one of our state's most valuable resources, the American alligator. Over the years, carefully designed research projects led to successful "sustained use" harvest programs of wild subadult and adult alligators as well as alligator eggs, which can be collected by licensed alligator farmers from suitable wetland habitats statewide.

These programs benefit the many Louisiana citizens who elect to participate in them including private landowners, alligator trappers, alligator farmers and their employees, alligator buyers and dealers. In 2008, the value of these alligator resources (hides and meat) was approximately $70 million to Louisiana citizens.

Numerous LDWF employees are involved in the day-to-day operations needed to implement the alligator programs, loosely categorized into the wild harvest program and the farm program. In addition to these, we also maintain a nuisance alligator program to handle human-alligator conflicts and an active research and monitoring program, which is important to ensure that our harvest programs are not detrimental to the wild population of alligators.

## History

Alligators have been used commercially for their valuable leather since the 1800s. This harvest was generally unregulated throughout the 1900s, until a gradual population decline resulted in severely reduced harvests in the early 1950s. In 1962, the alligator season in Louisiana was closed and research studies, mostly basic life history, were undertaken that led to development of a biologically sound management program. Of tremendous importance was the establishment of a rigorous survey method to estimate and monitor population trends.

From 1962 through August 1972, alligators were totally protected and alligator populations increased rapidly. Concurrently, a myriad of state and federal laws regulating harvest distribution and allocation of take, methods of harvest and possession, and transportation and export of live alligators, alligator skins and their products were enacted. The Louisiana Legislature recognized the value of alligators and in 1970 passed legislation providing for a closely regulated experimental commercial harvest under the full authority of LDWF.

Because of its research program on alligators, LDWF was ready to initiate its new sustained use management program by 1972. On Sept. 5, 1972, the alligator season was reopened in Cameron Parish and a total of 59 hunters harvested 1,350 alligators. The season was expanded to include Vermilion Parish in 1973, Calcasieu Parish in 1975, nine additional coastal parishes in 1979, and statewide in 1981. In recent years, some 35,000 wild alligators have been harvested by about 2,000 licensed alligator hunters annually.

## Wild Alligator Management Program

The goals of the department's alligator program are to manage and conserve Louisiana's alligators as part of the state's wetland ecosystem and provide benefits to the species, its habitat and the other species of fish and wildlife associated with alligators. The basic philosophy was to develop a sustained use management program which, through regulated harvest, would provide long-term benefits to the survival of the species, maintain its habitats and provide significant economic benefits to the citizens of the state.

Since Louisiana's coastal alligator habitats are primarily privately owned (approximately 81 percent), our sustained use management program provides direct economic

By Noel Kinler, LDWF Alligator Program Manager, Ruth Elsey and Lance Cambell, LDWF Alligator Program Biologists

benefit and incentive for alligator hunters who lease land and private landowners to protect the alligator, as well as its habitats. With this in mind, development of fair regulations governing application for tag allocation was very important. The process requires individual applications for each property be made with landowner permission and proof of ownership provided. A detailed review of habitat quality by biologists related to alligator abundance on submitted properties equitably distributes the harvest in relation to population levels.

An essential element of the alligator program is determination of population abundance and distribution. Since 1970, LDWF has annually inventoried alligator nest production throughout coastal Louisiana in order to assess the status of alligator populations. Results of annual alligator nest surveys are compiled to provide estimates of nest density (acres per nest) by parish and by habitat type (brackish, intermediate or fresh). Private and publicly-owned lands (state and federal refuges and wildlife management areas) are compiled separately.

Every year in June/July, over 2,800 miles of transects are flown by helicopter, surveying 135,000 acres of wetland habitat. The sampling intensity covers approximately 3 percent of 2.3 million acres of private coastal wetlands, and 3 percent to 11 percent of 622,000 acres of public coastal wetlands. Coastal habitats have been significantly affected by the hurricanes in 2005 and 2008, and the subsequent droughts in 2006 and 2009 caused lower nest counts (*Figure 1*).

Nest density and alligator population estimates are combined with a detailed review of harvest parameters and a general assessment of environmental factors observed during each survey to determine final harvest level objectives. Over 50 individual alligator harvest quotas are developed annually in order to distribute the harvest in relation to alligator abundance in the various habitats across the state. In the best habitats one alligator is harvested per 55 acres, while in the poorer habitats one alligator is harvested per 500 acres. The currently approved quota system represents an allowable wild alligator harvest, which, coupled with the state-authorized wild alligator egg harvest program, provides a level of population utilization currently unparalleled in the world of crocodilian management.

The annual harvest takes place in September. Adult females, which typically inhabit interior marshes in September, would be more susceptible to harvest if the season was scheduled during the spring or summer. Adult males prefer deeper water habitats (canals, lakes, etc.) and an autumn harvest allows us to selectively harvest predominantly adult males or immature alligators of either sex. During the 2007 wild season, a total of 31,121 alligators were harvested, averaging 7.5 feet in length, with an estimated value of $12.2 million. The 2008 harvest was impacted due to hurricanes Gustav and Ike, but trappers still filled 30,196 of the 36,325 "standard" tags issued and used 3,406 of 4,424 "bonus" tags issued (*Figure 2*). Participation in the 2009 harvest was less than normal because the worldwide economic crisis led to low demand and prices. Thus, some hide buyers/dealers elected not to purchase the quantities of hides that they historically processed.

Each year, the alligator program staff works closely with landowners and alligator hunters to provide assistance regarding alligator management on their respective properties. We have provided numerous habitat base maps to landowners for their use in participation in both the wild and alligator egg harvest programs. Harvest reports summarizing average lengths and size class frequency distribution of harvested alligators are available upon request.

Numerous opportunities also exist for the public to participate in wild alligator harvest programs on state-owned WMAs and public lakes. Some 725 alligator harvest tags were available in 2009 via LDWF sponsored lottery hunts.

LDWF has recently been converting landowner property descriptions to a digital format, encompassing land ownership, marsh type (fresh, intermediate, brackish,

Photo courtesy of USFWS

**Figure 1. Louisiana Coastal Marsh Alligator Nest Projections, 1970-2009**

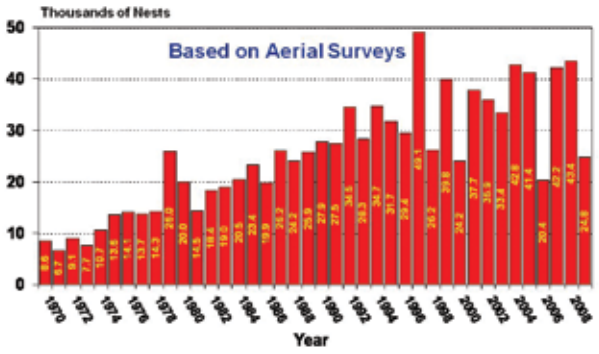
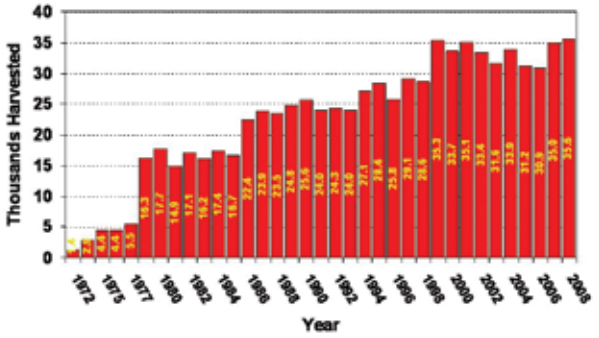



**Figure 2. Louisiana Wild Alligators Harvested, 1972-2008**



saline or swamp) and parish lines. This system helps us to more accurately assess each piece of property and better allocate quotas for alligators to be harvested. Delineating the wetlands and calculating percentages owned (divided interests between several trappers) is very complex and time consuming. The necessary processing includes review of hunter applications, landowner leases, maps and property assessments.

When the September season approaches, many LDWF employees participate in the actual issuance of Convention on International Trade in Endangered Species (CITES) tags and licenses to approximately 2,000 trappers throughout the state. Throughout the month-long harvest, staff members are stationed in processing sheds at numerous locations to collect data from harvested alligators, including sex, length and "retraps" of alligators that were previously released from a farm and later harvested in the wild. LDWF biologists might also perform dissections and collect samples (stomachs, reproductive tracts or various other samples) for subsequent analyses.

## Farming/Ranching Program

Early alligator farms in Louisiana were generally small, family-owned operations and often run more as a hobby/curiosity than a commercial enterprise. Extensive studies done by LDWF biologists showed alligators could be efficiently cultured and grown in captivity. Egg ranching (collection of alligator eggs from the wild) proved more economical and successful than captive breeding; egg collections from private lands were first permitted in 1986 on a limited basis.

Louisiana's alligator ranching program increased dramatically between 1986 and 1990. To ensure wild alligators were not depleted as a result of egg collections and to ensure future recruitment of sub-adult alligators to the breeding population, LDWF currently requires a quantity of juvenile alligators be returned to the wild within two years of hatching. One of the most important, as well as labor intensive, parts of the alligator program involves the mandatory release of alligators from farms to the wild. Because alligator farmers are allowed to collect eggs from the wild (which helps avoid natural mortality from flooding, predation and desiccation), the percentage of juvenile alligators estimated to have survived on their own had the eggs not been collected must be replaced. Extensive research suggests this is about 12 percent of the eggs hatched. Thus, the alligator farmer may keep 88 percent of the hatchlings obtained from collected eggs, grow these to harvestable size and sell the valuable hides and meat. The other 12 percent must be released back to the wetlands from which the eggs were collected within two years of collection, when the alligators are around three or four feet in length.

A variable return rate was established based on the estimated survival rates for wild juvenile alligators. Using the relationship of survival between size classes, return rates based on expected survival rates for alligators from 36-60 inches were extrapolated. More alligators must be returned if the average total length is smaller, and fewer animals are required if the average length is larger. Close monitoring of the survival of these alligators will continue for many years.

Enormous effort has been made by LDWF to monitor the fate of the alligators released to the wild. In some years, 40,000-50,000 farm-raised alligators or more are released into the wild to offset impacts of egg collections on wild alligator populations. Each alligator released is measured, sexed, tail-notched and tagged prior to release. Although it is costly to the ranchers to fulfill the "returns to the wild" obligation, it is an integral necessity of the program considering the large number of eggs collected. In 2007, 501,175 wild alligator eggs were collected producing 426,480 hatchling alligators. In 2008, farmers collected a record 530,579 eggs. However, the current economic crisis led to a precipitous drop in egg collections in summer 2009.

Currently there are 59 licensed farms in Louisiana, and on-farm inventory as of December 2008 was a record 731,909 alligators. An estimated 300,000 farm-raised alligators were harvested in recent years.

## Alligator Industry

Louisiana's wild and farm alligator skins are exported throughout the world. Over 95 percent of the farm alligator skins produced in Louisiana is exported abroad with approximately 85 percent of the wild harvested alligator skins going to France, Italy, Germany, Singapore and England.

In order to better meet the needs of the alligator industry, LDWF sponsors meetings for all segments of the industry (farmers, hunters and landowners) which gives the industry participants an opportunity to prioritize and discuss the current issues facing the state's alligator industry. In addition to the on-site visits, LDWF staff communicates with farmers on a regular basis to schedule releases, perform hide and live animal inspections, coordinate farm transfers, issue alligator egg collection permits, and issue and follow up on CITES tag disposition.

Year-round, farmers may process alligator hides to be shipped for tanning and later processing into high quality leather goods. Alligator hides (from farms and wild harvest) must be inspected by LDWF employees to be sure a federal CITES tag is affixed in the tail. This tag has a number to trace its source back to the trapper or farmer to whom it was issued. Alligator program staff verify that each hide listed on the export manifest is in the crate to be shipped and replaces any broken tags with substitute tags.

At the time of the hide inspection, a $4 tag fee is collected as well as 25 cents severance tax for each alligator hide (wild and farm). These industry generated fees are deposited into the Alligator Resource Fund, which funds the operating costs of the alligator program. As such, the alligator program is self-supported and does not rely on state general fund revenue.

## Summary

Louisiana's alligator management program has clearly illustrated that controlled sustained use of the species is feasible. The wild harvest has been in place for 37 years and the egg ranching program for 23 years and may appear to operate unchanged every year. However, constant adaptations are made to try to improve both programs. Requests by user groups (farmers, egg ranchers, trappers, landowners, buyers, dealers and other industry personnel) are received and considered as the department strives to safely manage the alligator resource to the benefit of many user groups with varied interests.

Because the alligator program is so large and citizens statewide participate in the harvests, numerous other department employees help with administration of the alligator program in addition to their regular duties. Cooperation between divisions within the agency helps keep this valuable program running smoothly and ensures citizens in all regions can get assistance with alligator issues by professionals domiciled in the nearest LDWF office.

We're also pleased that many non-consumptive users benefit from the wild alligator resource. The mystique and aesthetic value of seeing a large wild alligator is of value to locals and visitors to our state. Many tourists and photographers travel long distances for the opportunity to get a glimpse of this unique species in the wild.

The LDWF alligator program has evolved from the first small, very limited, wild harvest back in 1972 to the highly regulated multi-million dollar industry it is now. We hope to continue improving our programs for the future benefit of our state's citizens. ■

**FOR MORE INFORMATION**

For additional information, please visit *www.lagatorprogram.com* or e-mail LAalligatorprogram@wlf.la.gov.

# Sniffing Out the La. Pine Snake

By Gary Lester, La. Natural Heritage Program Manager

LDWF file photo

In 2007, the Louisiana Department of Wildlife and Fisheries' Natural Heritage Program was awarded a $20,000 Section 6 grant from the U.S. Fish and Wildlife Service (USFWS) for canine training. The money, which is being matched 75:25 (federal:state) with state conservation funds, has been used to train Patches, a 5-year-old Australian Shepherd, to detect the odor of an endangered animal. The Louisiana pine snake (*Pituophis ruthveni*), currently found in Bienville, Winn, Natchitoches and Vernon parishes in Louisiana and in two counties in eastern Texas, is a candidate for federal listing under the Endangered Species Act and already listed by the state of Texas as endangered. This area was historically the longleaf pine natural community, but much has been converted to loblolly pine. This non-venomous snake grows to 56 inches long, and is pale tan with a row of large black or brown blotches down the back, and a smaller series on each side. It has the largest eggs and hatchlings of any snakes in the United States.

Training was conducted November 2008 - March 2009 in Tampa, Fla. under the direction of Bill Whitstine, Master Trainer, known internationally for his work with training dogs for sniffing out bedbugs in hotels and residences throughout the U.S. and Canada. The technique used by Whitstine involves use of "seek" and "show me" commands, followed by a reward of food. His work has brought him international acclaim and landed him numerous spots on the *Today Show* and other television venues. He has also been featured in *Newsweek* and other international periodicals.

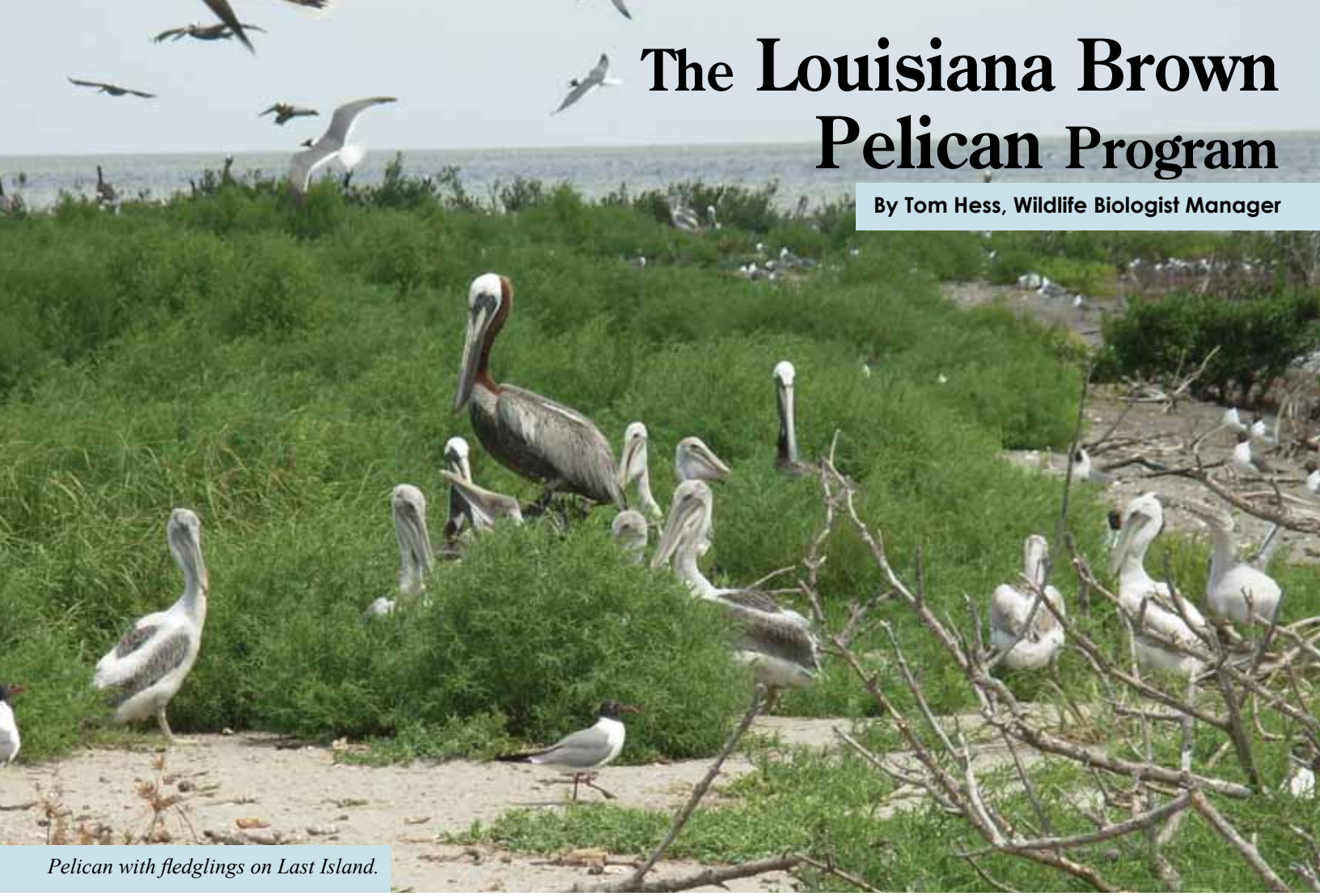
Since his return to Louisiana, Patches has been transitioning between the artificial indoor setting for training to the natural work environment at a site in Bienville Parish. This site is currently owned by an industrial timber company, which is involved with longleaf pine restoration on the area. The Louisiana pine snake is associated with areas of deep sandy soils housing pocket gophers (*Geomys breviceps*), its primary prey. The snake enters a gopher tunnel, eats the gopher, and remains in the intensely regulated atmosphere of the tunnel until he's ready to seek food again, which may be a month or more. At that time, the snake exits the burrow and searches for another tunnel for its next meal. Since much of its life is spent in gopher burrows, traditional trapping methods are inefficient at capturing this secretive species of snake. Traditionally, traps have been wire box traps positioned on the surface of the ground at intersections where metal fencing has been erected at right angles. The fences are about 18 inches high, with a buried base that discourages the animal from digging under. Snakes tend to move forward until they encounter an obstruction, at which time they move along the obstruction. This trapping technique funnels them in the covered traps where they find a place to survive until a biologist releases them. Traps, which have water provided so captured animals can survive, are checked weekly. Using this method for over 10 years (approximately 250,000 trap days), scientists have successfully trapped only 76 Louisiana pine snakes. It is not clear wether our numbers reflect how rare the snake is in the wild, or if the trapping method we've been using is not adequate to gather sufficient data to understand the status of the population. Using a dog to pick up the scent of the snake will provide us with another tool for searching for this illusive species of snake.

We are currently working with USFWS, U.S. Forest Service, U.S. Department of Defense and others to determine the protocols for using canines to search for snakes in the wild. Initial protocols should be finalized this year, and we anticipate field surveys to commence in the spring of 2010. These surveys will expand beyond the single property owner in Bienville with whom we are coordinating this study. Fort Polk and Kisatchie National Forest will be cooperators for this work. An additional $20,000 of USFWS Section 6 funds has been granted to the Natural Heritage Program to continue our work.

Patches' ability to sniff out Louisiana pine snakes has brought him some attention. He was recently asked by the Audubon Zoo to demonstrate his skills to 2,800 school children as part of their Earth Day celebrations. As I wrote in an email the next day, approximately 5,600 small hands touched him that day, and he loved every one of them. On a much smaller level, he has also given demonstrations at schools in Baton Rouge. His friendliness with people makes him a positive ambassador for the agency, and he revels in all the attention. A morsel of food, a pat on the head and a "good dog, Patches" response from me is all he wants for his hard work. ■

# The Louisiana Brown Pelican Program

**By Tom Hess, Wildlife Biologist Manager**



*Pelican with fledglings on Last Island.*

The brown pelican has always been considered a revered bird and wonder of nature throughout the history of the United States. William Claiborne, the first governor of Louisiana Territories after the Louisiana Purchase of 1803, suggested that the brown pelican appear on Louisiana's state seal. Brown pelicans were known to be common residents along Louisiana's coastal beach zone before 1900. However, population estimates varied greatly. In 1919, the Louisiana brown pelican population was estimated at 50,000 birds. Other estimates prior to 1930 ranged from 12,000 to 85,000 birds. The largest nesting colonies occurred from the Timbalier Island Chain to the Northern Chandeleur Islands (*Figure 1*).

The Louisiana brown pelican population began declining in the late 1950s. Nesting stopped in the state in 1961, followed by their disappearance from the state in 1963. The last nesting colony was located on North Island at the north end of the Chandeleur Chain. Louisiana's brown pelican population extirpation was initially believed to be a result of a reduction in food from insecticide poisoning. However, after a severe die-off in 1975, Louisiana Department of Wildlife and Fisheries (LDWF) personnel and contaminant specialists later documented the extreme sensitivity of brown pelicans to endrin contamination (a DDT analog formerly used in insecticides).

LDWF and the Florida Game and Fresh Water Fish Commission began a brown pelican restocking program in 1968. Ted Joanen and Larry McNease (retired LDWF biologists), along with Dr. Leslie Glasgow, a Louisiana State University wildlife professor, played a pivotal role in getting the project started. From 1968 to 1980, 1,276 brown pelican hatchlings ranging from 8-10 weeks old, were transported from Florida nesting colonies to Grand Terre Island, Isle aux Pitre and North Island, and Louisiana's brown pelican population has grown exponentially since then. Between 1971 and 2007 the number of active nesting colonies ranged from four to 15, with the average number of fledglings produced per colony per year ranging from 38 to 7,680, but nest success and production varies due to weather conditions during the nesting season (March - September) (*Table 1*).

Larry McNease documented the detrimental effects of tidal flooding associated with storms on brown pelican productivity. McNease stated that, "Island habitat degradation is a chronic factor which has adversely impacted nesting since the first egg was laid in 1971." In 2005, tropical storm Arlene, followed by hurricanes Cindy, Dennis, Emily, Katrina and Rita reduced all brown pelican nesting colonies. Hurricanes Katrina and Rita severely eroded and degraded nesting colony sites from Last Island in Terrebonne Parish to North Island in St. Bernard Parish. Amy Sallenger, a USGS oceanographer, reported areas within the Chandeleur Islands previously 18 feet above sea level, were so greatly impacted after Hurricane Katrina, that no area rose above six feet. The entire Chandeleur land mass was reduced by 90 percent.

The United States Fish and Wildlife Service (USFWS) received special congressional appropriations in response to the 2005 hurricanes. After developing several grant proposals for hurricane impact related projects, LDWF received $200,000 for a multi-year brown pelican research-translocation project. This project, which began in 2007, had three primary objectives. The first was to gain additional information on the basic life history of Louisiana brown pelicans. Second was to continue banding efforts to track brown pelican movements. The third objective was to translocate brown pelicans to un-colonized islands in an attempt to distribute colonies across a wider geographic

*Helicopter used to monitor brown pelican activity along the coast.*

LDWF file photos

*Jeb Linscome, Waterfowl Biologist, captures pelicans for banding.*

area. Between 1984 and 1986, LDWF relocated 149 brown pelican fledglings from Queen Bess Island to Last (Raccoon) Island. As a result of this relocation project, there have been 102,172 fledglings produced between 1988 and 2007 on Last Island. These efforts promote brown pelican conservation efforts by distributing subpopulations more widely, rendering the entire Louisiana population less vulnerable to extirpation in the event of future storms.

In 2007, a new collaborative research project between the University of Louisiana at Lafayette, LDWF and USFWS began. Since then, over 300 young pelicans have been moved from Last Island to Whiskey Island, approximately 1,500 birds have been banded, and extensive habitat and nesting observations have been made.

The brown pelican is scheduled to be removed from the endangered species list in the near future. Monitoring data, such as provided in Table 1, have been important components of this process and will continue to be following the delisting. Between 1993 and 2008 a helicopter has been used to monitor and survey brown pelicans and other sea birds along the Louisiana coast. The data were used to detect population changes from high tides, tropical storms, hurricanes and oil spills.

LDWF file photo

Even though brown pelicans generally practice nest site fidelity, recent aerial surveys indicate new colonies developing through natural expansion. This discovery illustrates the importance of monitoring. LDWF has spent over 40 years reestablishing and managing Louisiana's state bird and will continue to do so in the future. ■

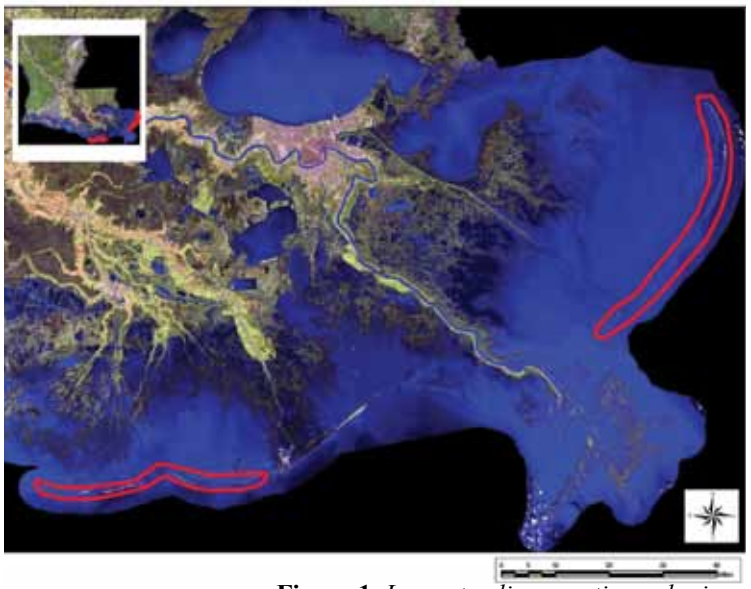


**Figure 1.** *Largest pelican nesting colonies*

**Table 1.** *Louisiana Brown Pelican data for 11 colonies from 1971-2007*

| Colony | Years Active | Colony Start | Colony End | Total # Fledglings Produced per Colony | Avg. # Fledglings per Colony per Year | Colony Size (acres) | Avg. # Fledglings Produced per Acre per Year | Avg. # Fledglings Produced per Nest | Translocation Site | Natural Colony Expansion |
|---|---|---|---|---|---|---|---|---|---|---|
| **Queen Bess** | 37 | 1971 | Active | 53,473 | 1,445 | 35 | 41 | 1.4 | Yes | |
| **Last (Raccoon) Island** | 20 | 1987 | Active | 102,172 | 5,109 | 120 | 43 | 1.7 | Yes | |
| **Shallow Bayou** | 4 | 2004 | Active | 9,156 | 2,289 | 15 | 153 | 2.4 | | Yes |
| **Wine Island** | 7 | 2001 | Active | 1,996 | 285 | 35 | 57 | 1.6 | | Yes |
| **Baptiste Collette** | 8 | 2000 | Active | 39,850 | 4,981 | 30 | 166 | 1 | | Yes |
| **West Breton*** | 4 | 2002 | 2005 | 30,720 | 7,680 | 65 | 118 | 1.7 | | Yes |
| **Pelican Point** | 8 | 2000 | Active | 3,340 | 418 | 40 | 10 | 1.5 | | Yes |
| **North Island** | 28 | 1979 | Active | 26,813 | 958 | 270 | 4 | 1.5 | Yes | |
| **Brush Island** | 4 | 2003 | Active | 615 | 154 | 75 | 2 | 1 | | Yes |
| **Mitchell Island*** | 6 | 1998 | 2003 | 225 | 38 | 12 | 3 | 1.1 | | Yes |
| **Martin Island** | 10 | 1998 | Active | 1,925 | 193 | 40 | 5 | 1.1 | | Yes |
| **Total** | | | | **270,285** | **23,550** | | **602** | **16** | | |
| **Average** | | | | **24,571** | **2,141** | | **55** | **1.5** | | |

**Colony Habitat Destroyed by Hurricanes Katrina and Rita in 2005.*

# Louisiana's Natural Areas Registry

## *Private landowners conserving our state's natural heritage*

**By Patti Faulkner and Judy Jones, La. Natural Heritage Program**

LDWF file photo

*Proud owner of calcareous prairie site receives his Natural Areas membership recognition plaque.*

Pressures from development, conversion of natural areas to other uses, wetland losses, and urbanization have significantly reduced and fragmented the natural areas still remaining in our state, resulting in decreased habitat for Louisiana's native wildlife and loss of outdoor recreational spaces. Today, only a small fraction of our natural places remain in more or less pristine condition.

Traditionally, the primary approach to conservation of natural areas has been government acquisition and management in places such as state parks, wildlife management areas or national parks and forests. However, the extent of these conservation areas is small when compared with the amount of native wildlife habitat encompassed by private lands. According to the Louisiana Forestry Association, 48 percent of Louisiana (approximately 13.8 million acres) is in forests. Of that total acreage, 62 percent is owned by non-industrial private landowners, 29 percent is managed by timber industry, while only 9 percent of Louisiana's forestland is in public ownership - state or federal. Consequently, conservation efforts must include private lands. For this purpose, the Louisiana Natural Areas Registry was created.

The registry was created by an act of the Louisiana Legislature in 1987. It is managed by the Louisiana Natural Heritage Program (LNHP) of the Louisiana Department of Wildlife and Fisheries (LDWF). The registry is designed to honor and recognize owners of outstanding natural areas for their commitment to the protection of Louisiana's natural heritage. The registry program has no designated permanent funding source and, since 2003, has relied on State Wildlife Grants funding. During this time, the program has added 57 new registries (an increase of 85 percent), developed new partnerships (e.g. – Louisiana Office of State Parks, timber corporations), instituted a quarterly newsletter, helped many landowners acquire cost-share funds to support management of their natural areas and developed a permanent protection option through conservation servitudes. To date there are 110 landowners with their properties in the registry. The lands are located in 34 parishes and consist of over 46,000 acres under voluntary conservation. The conservation servitude option, offering permanent protection for private lands, was adopted this year, and the program is currently working on its first servitude agreement for an old-growth shortleaf pine/oak-hickory forest in north Louisiana.

So, just how does the registry work? LNHP acquires and manages data on rare, threatened and endangered species and natural communities in our state. These data along with topographic maps and aerial photos are used to identify potential sites for providing important habitat for some of Louisiana's rare species. A registry representative then contacts landowners of these areas to discuss the special plants, animals or natural communities that occur on their properties. Educating owners about the importance of their property has a tremendous impact. It greatly reduces the chance that significant natural areas of our state might be inadvertently destroyed. The registry program is completely voluntary and registered sites are only publicized at the owners' request or with their approval. The registration agreement provides no rights of public access and exact locations of properties are never published.

To qualify for the registry, a property must contain at least one of the following natural values:

- Habitat for native plants or animals with rare or declining populations in Louisiana, such as the Small Stream Forest (*Figure 1*) and the globally rare Louisiana pearlshell mussel (*Margaritifera hembeli*) (*Figure 2*), which is found in the creeks under this forest canopy.
- Plant communities characteristic of the native vegetation of Louisiana such as the saline prairie (*Figure 3*) found in central and northwest portion of the state and home to numerous rare plant species.
- Contains outstanding natural features such as old growth forests or wetlands.

When a landowner decides to register a property in the registry, a program representative develops an agreement specific to that property. The agreement will name the landowner, describe the property, the natural habitat and any rare plants or animals found there. By signing the document, the owner agrees to protect the area and its unique species and habitats to the best of his

LDWF file photo

**Figure 1.** *LNHP biologist surveying for mussels along Clear Creek in Grant Parish.*

LDWF file photo

**Figure 2.** *Close-up of the Louisiana pearlshell mussel (Margaritifera hembeli).*

or her abilities, to notify the program of any threats to the area or the plants and animals within, and to notify the program of any intent to sell or transfer ownership of the area. The agreement is not legally binding, does not subject the property to any additional legal regulations, and involves no payment or receipt of funds. To honor this special commitment to protect Louisiana's natural areas, the property owner receives a framed certificate bearing the owner's name and selected name of the registered area that has been signed by the owner, LDWF Secretary and the Governor of Louisiana.

Upon entering the registry program, LNHP works with landowners to provide guidance for appropriate management of their unique natural areas. LNHP develops free of charge a management plan specific to the special habitat on the registered area to act as a guide for proper maintenance of the site. It can also provide a listing and guidance on state, federal, and private conservation programs and options. Some of these conservation programs provide cost-share funds to defray landowners' expenses for activities such as prescribed burning and invasive species control. Also available is the option of an annual ecological check-up on the health of the plants, animals and habitat of concern on the property, and consultation on how best to protect the area should a transfer of ownership or other change become necessary. Landowners receive the quarterly published Natural Areas Newsletter, which contains information such as updates to the registry, new conservation programs, and information on Louisiana's natural communities and rare species.

The conservation servitude option offers the choice of permanent protection of their properties for landowners who qualify. The conservation servitude is a detailed legal agreement that identifies the conservation values on a property and prescribes targeted restrictions on use and development that would threaten those conservation values and defines allowed uses that are consistent with their protection. The landowner and LDWF tailor servitude terms to protect the land's conservation values and meet the needs of the landowner. Once the terms and conditions have been agreed upon, the conservation servitude is deeded to the servitude holder, in this case LDWF and its Natural Areas Program, through a donation. The landowner assumes the responsibility of management while continuing to enjoy the use and control of their property. LDWF assumes permanent legal responsibility of ensuring the protection of the identified conservation values by periodically monitoring the property and upholding the terms of the conservation servitude. The servitude is permanently bound to the property upon which they have been placed even with ownership changes.

All Natural Areas' participants (registry and servitude) have the satisfaction of joining other select Louisiana landowners in a voluntary program to protect natural diversity, benefiting present and future generations for our state and nation. LNHP feels that a knowledgeable and active citizenry is key to protecting our natural environment. The people of Louisiana are the guardians of their own natural heritage and support from all our citizens is needed to ensure that our outstanding natural areas are preserved. ■

LDWF file photo

**Figure 3.** *Globally rare saline prairie found in DeSoto Parish.*

## FOR MORE INFORMATION

For additional information on the Natural Areas Registry Program, visit the LDWF website at: *http://www.wlf.louisiana.gov/experience/naturalheritage/naturalareasregistry/* or contact Judy Jones at jjones@wlf.la.gov or 225-765-2822.

# Chronic Wasting Disease

## *What you need to know*

**By James M. LaCour DVM, LDWF Wildlife Veterinarian**

Chronic wasting disease (CWD) is a fatal, progressive neurologic disease of ruminant animals of the Cervidae family. This family of animals includes white-tailed deer, mule deer, elk and moose. It is caused by an infectious protein particle known as a prion. Other diseases caused by prions include "mad cow disease" or bovine spongiform encephalopathy, scrapie in sheep and Creutzfeldt-Jakob disease in people. There is no curative treatment for animals that contract CWD.

Prions are smaller than bacteria and viruses and are extremely resistant to conventional methods of disinfection, including chemical and steam sterilization and irradiation. Prions can exist in soils indefinitely. These infectious particles have been observed in saliva, urine and feces from infected animals and trans-placental transmission has been documented. Prions are also deposited in the soil from decomposing, infected carcasses.

Prions cause a disease known as spongiform encephalopathy. Basically the disease process results in vacuolization or "holes" in the brain. Upon microscopic examination the brain appears as a sponge. This brain vacuolization is a slow process, occurring months to years after infection, and results in animals which have neurologic disorders. These animals may exhibit abnormal behavior, drooling and lack of coordination, and nearly all will ultimately exhibit weight loss, hence the name "chronic wasting disease." Other causes of weight loss include malnutrition, parasitism and epizootic hemorrhagic disease. In most states these causes are much more prevalent than chronic wasting disease.

CWD was first documented in a mule deer in Colorado in 1967. Currently, CWD is found in 14 states and two Canadian provinces. It has never been documented in Louisiana. CWD has been spread from state to state by natural movement of wild animals, purposeful movement of both wild and captive cervids, and by the movement of infected animal parts. At least one state had CWD introduce via a deer head brought in from a CWD endemic state for taxidermy.

CWD has never been eradicated from any state in which it was discovered even though states have spent millions of dollars in monumental culling and testing operations. Nonetheless, culling programs remain the standard protocol for most states because it is believed that no action in high density herds is worse. Currently, in cooperative effort between individual states and the United States Department of Agriculture (USDA), an extensive surveillance effort is underway. Louisiana, for example, has tested over 6,000 white-tailed deer carcasses for CWD since 2002.

The "gold-standard" of testing for CWD involves immunohistochemistry of the obex portion of the brainstem and the retropharyngeal lymph nodes. These tests can only be performed on dead animals; however some tonsillar biopsy testing has been performed on live, sedated animals with success. The newest technique for testing live animals for CWD is the RAMALT (rectoanal mucosa-associated lymphoid tissue) test. This procedure samples the rectal tissue of live, sedated animals. Immunohistochemistry is performed on this tissue and has been proven to pick up infections earlier than tonsillar biopsy. Although still in its infancy, RAMALT testing may prove to be a useful tool in surveillance for CWD prior to moving captive deer and elk

Unlike some of the other transmissible spongiform encephalopathies, CWD has never been proven to be transmissible to humans or non-human primates. Current research has shown that cattle are also very resistant to infection by CWD. Extensive testing of mountain lions which predate heavily on CWD infected deer has never documented infection. Meat from infected animals is considered safe for human consumption; however, meat from known CWD-positive animals is generally disposed of by state and federal agencies via incineration or proper landfill disposal. When hunting in CWD positive states, it is recommended that the hunter wear dispos-

able latex gloves while field dressing game. It is also advised that the carcass be deboned on site with the hunter only removing the muscle tissue from the field. Likewise, for trophy mounts, the mount should be caped out and no brain, spinal tissue or skull plate should be removed from the field. Some states have regulations regarding importation of animal tissues for taxidermy purposes, and generally require the animal to be prepared in the aforementioned manner. Likewise, some CWD positive states provide hunter instructional videos which arm hunters with the know-how to sample their own animals. Those states will test hunter-submitted samples and relay findings to the hunters who may decide to return meat from CWD-positive animals to the state for incineration. Currently, Louisiana has no regulations on the importation of taxidermy specimens, but taxidermists are encouraged to have specimens from CWD-positive states checked by Louisiana Department of Wildlife and Fisheries biologists and are instructed to dispose of carcass parts by incineration, deep burial or landfill disposal.

Another avenue for the prevention of introduction of CWD into states involves regulations on the importation of captive deer into states which are CWD free. Currently, importation of cervids into Louisiana is limited to captive deer, elk and other exotic deer for use in Louisiana Department of Agriculture and Forestry approved alternative livestock pens (game farms). These animals must come from herds which have had no clinical cases of chronic wasting disease within the past five years. This same time-frame has been proposed by the USDA in its proposed CWD Final Rule regarding interstate transport of captive cervids.

In summation, by continued surveillance and diligent actions by hunters and wildlife managers, we can insure that Louisiana remains free from chronic wasting disease. This disease can have a dramatic impact on wildlife health and perceived wholesomeness of the venison supply, and may result in fewer deer hunters across the state. Remember that in this country, hunters provide more funds for conservation than any other single source. Any reduction in the number of active, licensed hunters means a reduction in conservation funds. Chronic wasting disease is the epitome of "an ounce of prevention is worth a pound of cure." We must take all measures possible to prevent its introduction into the deer of Louisiana. Please contact your local Louisiana Department of Wildlife and Fisheries biologist if you find a deer that you suspect of having chronic wasting disease. ■

Photo courtesy of Wyoming Game & Fish

*Captive white-tailed deer (above) and elk (below) displaying symptoms of chronic wasting disease.*

Photo courtesy of Wyoming Game & Fish

Photo courtesy of USDA

**FOR MORE INFORMATION**

More information on CWD is available on the Chronic Wasting Disease Alliance website at *www.cwd-info.org* or see the link on the LDWF website.

Top photos courtesy of Wikimedia Commons

# Nuisance Wildlife

**By Carrie Salyers, Wildlife Biologist, Rockefeller Refuge**

Scratching in your wall? Hearing things go "bump in the night?" Well, unfortunately you may have a new tenant in your home that you didn't invite and certainly not one that will help with the mortgage. Many residents across the state of Louisiana have dealt with these same tenants, known as nuisance animals.

Nuisance animal situations can range from bats in your wall or attic to armadillos digging holes in your new flower beds. Residents across the state contact the Louisiana Department of Wildlife and Fisheries (LDWF) asking what they can legally do to rectify their current situation and get their life back on track. Hopefully this article will help answer that question in the event a nuisance animal situation arises at your home.

Some individuals that contact the department may be surprised to hear LDWF's response. LDWF does not service nuisance animal calls (or injured/orphaned animal calls, discussed in our first issue of the Wildlife Insider). Instead, individuals experiencing nuisance animal problems have the following options to help correct their current nuisance animal situation:

1. You may hire a professional. Because LDWF does not have the staff to aid with nuisance animal situations, we permit private individuals, referred to as NWCOs (nuisance wildlife control operators). This permit allows individuals to legally work with nuisance animals on a commercial basis, meaning they charge a fee for this service. LDWF does not regulate the fees charged by NWCOs. LDWF's Title 76: Part V, Section 127, which governs NWCOs states:

   a. Only wildlife damage or nuisance complaints affecting humans and/or their property are considered valid complaints. Complaints involving conflicts between two or more species of wildlife are not valid nuisance wildlife complaints.
   b. NWCO permittees are only authorized to live trap and relocate, live trap and euthanize or lethally trap the following species when such action is warranted by a valid nuisance wildlife complaint: armadillo, beaver, bobcat, coyote, feral hogs, fox, mink, muskrat, nutria, opossum, otter, rabbit, raccoon, squirrel (including flying squirrel) and skunk.
   c. NWCOs may not legally work with alligators, bears, wild turkeys or any migratory bird (which includes all songbirds and raptors).

2. You may legally remove the animal yourself. LDWF's Title 76: Part V, Section 125, which governs control of nuisance wild quadrupeds states:

   a. This rule applies only to the control of the wild quadrupeds listed below and ONLY when they are conclusively proven to be creating a nuisance or causing damage to property. The burden of establishing that the animal in question is causing the property damage shall rest with the property owner.
   b. The following wild quadrupeds may be taken year-round without permit by the property owner or his designee, with written landowner permission, but only by trapping or shooting during legal daylight hours: coyote, armadillo, nutria, beaver, skunk, feral hog and opossum.
   c. Squirrels, rabbits, foxes, bobcats, mink, otter, muskrat, raccoons and any of the other species listed above may be trapped alive and relocated to suitable habitat without permit provided the following conditions are met:
      i. Written permission is obtained from the property owner where the animals are to be released

Bottom photos courtesy of USFWS

and such written permission is carried in possession while transport and release activities are taking place.

ii. Animals are treated in a responsible and humane manner and released within 12 hours of capture.

d. Traps shall be set in such a manner that provides the trapped animal protection from harassment from dogs and other animals and direct sun exposure.

e. Property owners must comply with all additional local laws and/or municipal ordinances governing the shooting or trapping of wildlife or discharge of firearms.

f. No animal taken under this provision or parts thereof shall be sold. A valid trapping license is required to sell or pelt nuisance furbearers during the open trapping season.

g. No species taken under the provisions of this rule shall be kept in possession for a period of time exceeding 12 hours.

h. This rule has no application to any species of bird as birds are the subject of other state and federal laws, rules and regulations.

For information regarding trapping and guidelines for specific animals, please refer to the department website at: *http://www.wlf.louisiana.gov/experience/lawildlife/nongame/urbanwildlife/* or contact your local wildlife office.

Although a permit is not needed for the activities discussed above, there are certain permits required and made available to interested individuals. This includes permits for night shooting beaver, coyotes, feral hogs and permits for squirrels found destroying commercial crops. Permit applications are available through your wildlife office.

Individuals interested in contacting an NWCO may do so by visiting our department website at: *http://www.wlf.louisiana.gov/pdfs/experience/Nuisance_Wildlife_Control_Operator%20List.pdf* or by contacting your local wildlife office.
(Note: If you have problems with alligators, bears or deer, contact your nearest LDWF office for information.)

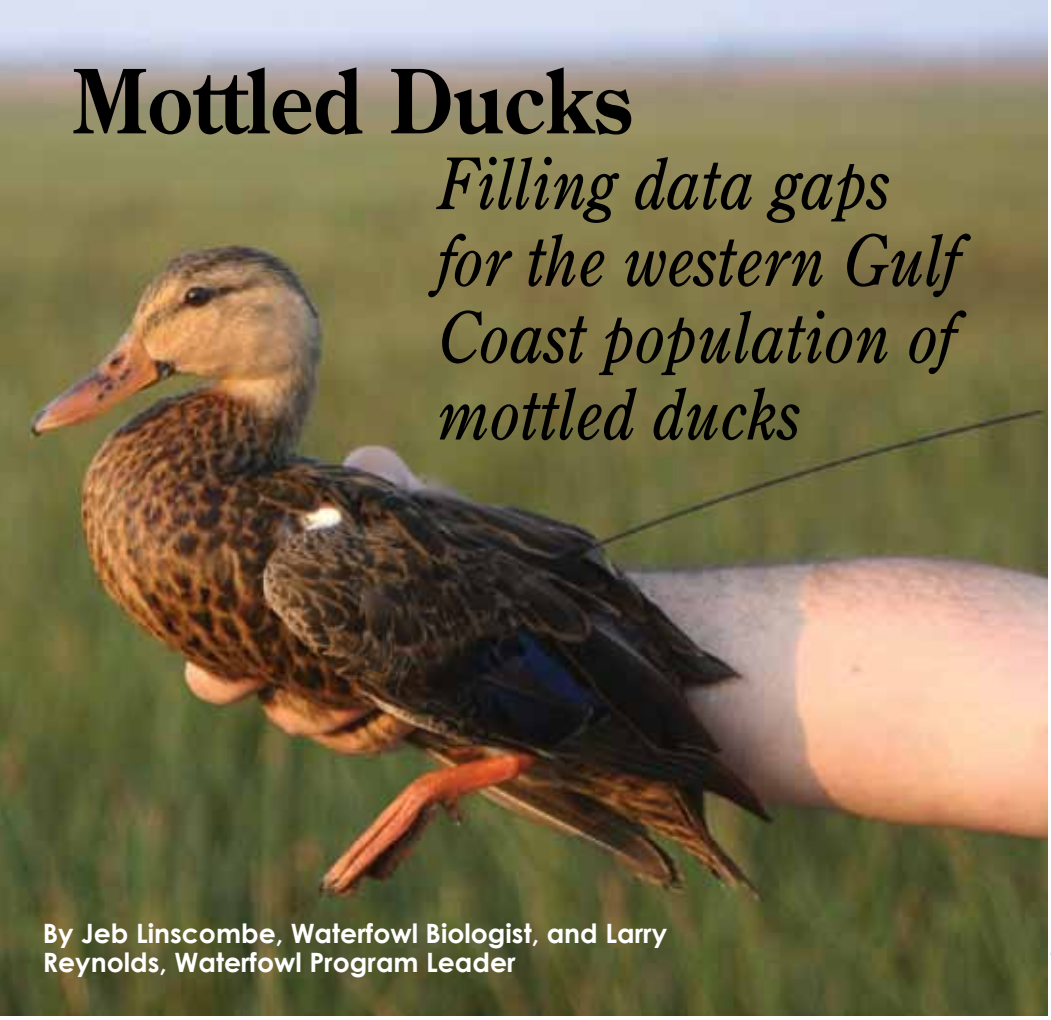
Finally, Title 76, Part V, Section 127 pertaining to game animals including deer reads:

Game animals, other than squirrels and rabbits, may only be taken by hunting during the open season under the conditions set forth under Title 56 of the Louisiana Revised Statutes and the rules and regulations of the Department of Wildlife and Fisheries. A permit may be issued to landowners or their designees to take white-tailed deer during the closed season when deer are causing substantial damage to commercial agricultural crops or orchards. Crops or orchards of less than five acres will not be considered for permits unless alternative exclusionary methods, including electric fencing, have been attempted and proven unsuccessful. Loss of 25 percent or more of the expected production or value of a crop must be documented by a Louisiana Department of Agriculture and Forestry crop specialist or Louisiana State University Cooperative Extension Service agent. Emergency deer removal permits may be issued by Department of Wildlife and Fisheries Wildlife Division with approval by the Deer Program Manager and Enforcement Division. Landowners or their designees may take only the number of deer recommended by a Department of Wildlife and Fisheries biologist and specified on the permit. Only antlerless or unbranched antlered deer are legal for removal. All deer taken under this permit must be tagged in a manner specified on the permit before being moved from the site of the kill. Deer may only be taken during daylight hours and all deer meat will be salvaged and donated to a recipient or charitable organization approved by the Department of Wildlife and Fisheries. Biological samples may be requested by Department of Wildlife and Fisheries biologists for research and health monitoring purposes.

As you can see, while LDWF doesn't handle nuisance animals per se, it has regulations which govern how you handle these animals. ■

# Mottled Ducks

## *Filling data gaps for the western Gulf Coast population of mottled ducks*



LDWF file photo

**By Jeb Linscombe, Waterfowl Biologist, and Larry Reynolds, Waterfowl Program Leader**

The mottled duck (*Anas fulvigula*) spends its entire life cycle in coastal areas ranging from Mexico to southern Florida. The Western Gulf of Mexico Coast (WGC) population occupies coastal wetlands and agricultural areas in Mexico, Texas, Louisiana, Mississippi and Alabama. This WGC mottled duck population is reproductively isolated from a separate breeding population in Florida, but data on population dynamics, habitat use, nesting ecology, survival, harvest rates and associated factors are rather limited. Population data collected during fall and winter aerial surveys and a breeding survey limited to National Wildlife Refuges in Texas suggested a decreasing population in recent years, at least in the Texas portion of the WGC mottled duck range (*Figure 1*). Combined with coastal wetland habitat losses in Texas and Louisiana, this decreasing population has prompted state, federal and private conservation agencies to take action over the past two decades. Over that time, Louisiana Department of Wildlife and Fisheries' (LDWF) Coastal and Non-game Resources and Wildlife divisions have worked together and in cooperation with universities and other conservation organizations to gather pertinent data to inform mottled duck management decisions. Important components of that data acquisition include banding, cooperative ecological research and improved surveys.

In 1994, because of concerns raised by the Central and Mississippi flyways about declining mottled duck populations and the lack of ecological data, LDWF staff at Rockefeller Wildlife Refuge began a long-term banding program. In 1997, this effort evolved into a large scale coast-wide effort involving state and federal personnel in Texas and Louisiana that continues today. Biologists and technicians use airboats and spotlights to traverse coastal wetlands at night in an effort to capture flightless young and molting adult mottled ducks. This collaborative effort has yielded over 50,000 banded mottled ducks with about 6,000 returns over the past 15 years. The first simple analysis verified regular east-west exchange between Louisiana and Texas mottled ducks (*Figure 2*). Although biologists long suspected a single Gulf Coast population, these data provided support for managing mottled ducks in the two states as one population.

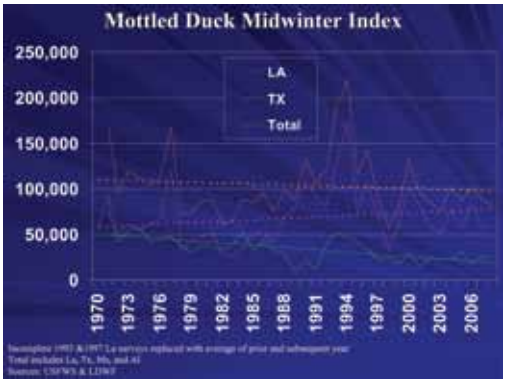
Earlier this year, the U.S. Geological Survey (USGS) conducted a comprehensive analysis of all Texas and Louisiana banding data from 1994-2006 and provided a report to the U.S. Fish and Wildlife Service (USFWS) on the Variation in Population Growth Rates of Mottled Ducks in Texas and Louisiana. Estimated survival rates were lower than most other species of dabbling ducks, including Florida's mottled ducks, and reproductive rates estimated from wings collected from hunters during the hunting season were also lower. The analyses indicate that although there is a lot of variation not accounted for by the models, the WGC mottled duck population declined rapidly from 1994-2006. Unfortunately, 1994 was the peak in mottled duck populations (*Figure 1*) and our initial banding effort, so longer-term population growth cannot be assessed.

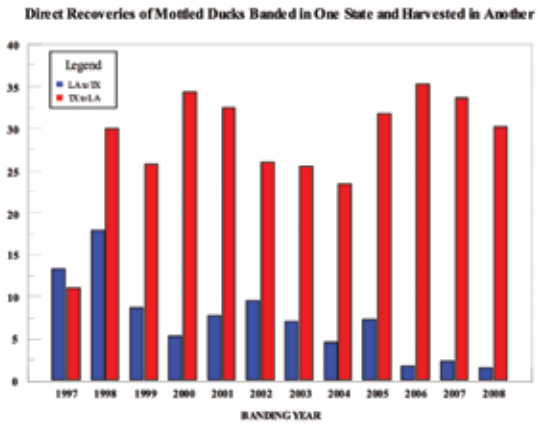
Another important estimate from banding data is the harvest rate, which is the proportion of the banded birds that are killed by hunters during the first hunting season after banding. The harvest rate gives managers information about hunting mortality, if it is changing, and if it might be a factor in population changes. To estimate the harvest rate, knowledge of the reporting rate is necessary. Reporting rate is the proportion of banded birds that are killed by hunters and then reported. If the reporting rate is less than 100 percent then the proportion of bands recovered (recovery rate) will be lower than the actual harvest rate. To estimate the reporting rate, reward bands are used on a sample of banded mottled ducks. The theory is that people who might not report killing a banded duck will do so if that report includes a $100 reward. LDWF placed reward bands in addition to standard USFWS bands on several hundred mottled ducks in 2007 and 2008. By comparing the recovery rate of mottled ducks with only standard USFWS bands to those with additional reward bands, and assuming that reporting rate for reward-banded mottled ducks was 100 percent, a reporting rate can be estimated and used to generate harvest-rate estimates for the entire banded sample. Analyses of these data are not complete, but it appears that in the 2007 and 2008 seasons, the reporting rate was approximately 70 percent. This allows adjustment of the recovery rate for the 30 percent of banded birds killed but not reported to get an estimate of the harvest rate on WGC mottled ducks.

The banding of mottled ducks has been ongoing since 1994, but efforts to fill other data needs are more recent. In 2003, the Gulf Coast Joint Venture (GCJV) established a Mottled Duck Working Group that met in August of that year and again in February 2004 to review all existing information pertaining to mottled duck population status, limiting factors and habitat influences with a goal of forming a conservation plan for WGC mottled ducks. In February 2006, the GCJV Management Board formally adopted a Mottled Duck Conservation Plan that establishes population goals, addresses highest priority limitations and provides recommendations on how to address those limitations. In April 2006, the USFWS convened a Mottled Duck Workshop with participants from the states of the Atlantic, Mississippi and Central flyways

to review the population status, distribution, vital rates and habitat requirements of mottled ducks and discuss appropriate harvest and habitat management frameworks. Among the recommendations from the mottled duck conservation plan and USFWS workshop were the need for additional research on habitat needs during the breeding season and a range-wide breeding population survey.

A cooperative three-year project was initiated in the summer of 2007 to study the seasonal survival of WGC mottled ducks, the extent and timing of movements along the Gulf Coast and habitat use during the molt and breeding season. This project involves two Ph.D. students: Bruce Davis, under the direction of Dr. Frank Rohwer at Louisiana State University, working in Louisiana; and Erin Wehland, under the Direction of Dr. Bart Ballard at Texas A&M University, Kingsville, working in Texas. Bruce has radio-marked female mottled ducks in conjunction with LDWF pre-season banding efforts using abdominally implanted transmitters with external antennae. Marked birds are located using an aerial grid of 28 transects spaced 20 km apart. Locations are monitored to attain information on survival, habitat use and movements. Although his work is ongoing and analyses incomplete, Bruce has reported low apparent survival, heavy use of fresh and intermediate marsh, especially intermediate marsh during the nest initiation period of March and April, and variable movement patterns.




LDWF file photo

*LDWF staff banding mottled ducks.*

His work, along with the similar effort in Texas is expected to provide information on this poorly-understood aspect of mottled duck ecology and recommend targeted management actions in places and at times most critical to this species.

Perhaps the biggest need is a range-wide spring breeding bird survey for mottled ducks similar to the one used for migratory waterfowl in the northern United States and Canada. The different population trends indicated by surveys in Texas and Louisiana, the lack of a visibility correction factor (VCF) on the winter surveys, and the non-representative nature of the Texas NWR breeding survey create uncertainty in mottled duck population status. If WGC mottled ducks are to be managed across states and flyways as one population, a scientifically defensible range-wide population estimate is necessary. Previous attempts to develop a survey have failed because of the difficulty in accounting for visibility bias associated with surveying mottled ducks from airplanes. It is well known how difficult it can be to spot mottled ducks and how much variation there can be in visibility among habitats. In March 2003, LDWF personnel used fixed-wing aircraft to conduct a mottled duck breeding survey on transects used on LDWF's mid-winter surveys. Selected segments of each transect were re-surveyed using an airboat, and biologists counted seven to eight times the number of mottled ducks seen from the airplane.

Unfortunately, over Louisiana's expansive coastal wetlands, a number of factors make the use of airboats impractical for determining VCFs in many habitats. So in April 2008, LDWF, Texas Parks and Wildlife and the USFWS attempted a breeding survey of mottled ducks using fixed-wing aircraft on established transects with a zig-zagging helicopter re-surveying selected segments to establish a VCF. In other words, mottled ducks were counted in an area 200 meters on each side of the transect line flown by the fixed-wing aircraft, and the next day, a helicopter would zig-zag through that same 400-meter wide length expecting to flush all mottled ducks. This technique has been used successfully in the northeastern U.S. and Canada for counting black ducks, where the helicopter flies from wetland to wetland within a forested complex. It had not been used in such contiguous habitat as Louisiana's coastal marshes. We lacked experience in how tightly to zig-zag and found that mottled ducks held in marsh grass without flushing, even with a low-flying helicopter. Results from the 2008 survey were not encouraging with a VCF of only 1.0 in southwest and 1.52 in southeast Louisiana, not close to the 7-8 recorded from an airboat in 2003.

Before giving up on the technique, Dave Fronczak of the USFWS, who is experienced with the zig-zagging helicopter technique, was recruited to assist in April 2009, and airboat segments were added to the survey to assess the VCF in areas where airboat access was possible. It was clear to Dave early in the survey that much tighter zig-zagging of the helicopter was required, and that provided much higher VCFs than in 2008. Because of the additional time needed to fly tighter zig-zags in each selected segment, fewer segments could be completed and VCFs were determined only for southwest Louisiana. Consequently, the VCF of 4.5 that was calculated could only be applied to a portion of the survey area - southwest Louisiana. So, although we have made progress towards a reliable breeding survey, there is still much work to be done to finalize a range-wide breeding survey. It is the results of cooperative efforts like banding, ecological research and survey development that we intend to use to inform the management prescribed in GCJV Mottled Duck Conservation Plan and harvest recommendations from the flyways to effectively conserve this showcase waterfowl species of the Gulf Coast. ■

# Louisiana's Scenic Rivers Program

By Keith Cascio, Wildlife Biologist Manager


Photo courtesy of Matt Weigle

In 1970, the Louisiana Legislature created the Louisiana Natural and Scenic River System by enacting the Louisiana Scenic Rivers Act (LSRA). The system was developed for the purpose of preserving, protecting, developing, reclaiming and enhancing the wilderness qualities, scenic beauties and ecological regimes of certain free-flowing Louisiana streams. Louisiana's Scenic Rivers System is one of the oldest and, to the best of our knowledge, the largest state system of its kind in America.

Today, there are approximately 3,000 miles of Louisiana designated Natural and Scenic Rivers. These rivers, streams and bayous, and segments thereof, are located throughout the state and offer a unique opportunity for individuals and communities to become involved in the protection, conservation and preservation of Louisiana's two greatest natural resources: its wildlife habitat and its water.

It is estimated that presently 110,000 acres in Louisiana are directly and actively managed by this system; that is, those acres that lie within one of these streams or within 100 feet of one of these streams fall directly under our permitting requirements and the prohibitions of the LSRA. A great many more acres fall under the jurisdiction of the LSRA in that "all activities that may directly and significantly degrade the ecological integrity" of a system stream are subject to the regulatory authority of the LSRA. The Louisiana Department of Wildlife and Fisheries (LDWF) has regulated activities as far as one mile from a system stream when it was determined that these activities were having clear, detrimental impacts on these streams.

## How does a stream become part of the Scenic Rivers System?

Rivers, streams and bayous, or segments thereof, can be nominated for inclusion in the system by your legislators. Once nominated, LDWF conducts a study on the stream to determine whether or not it meets the minimum qualifying criteria. If it does, it is recommended to the legislature for inclusion. Over the last 12 years, 12 streams have been nominated and nine of those were added to the system. During the 2009 Regular Legislative Session, Bayou Manchac south of Baton Rouge was added to the system as a Historic and Scenic River, and Bayou Liberty in St. Tammany Parish was nominated for inclusion in the system. No streams have been removed from the system in the last 14 years. If you believe a river, stream or bayou in your area should be included in the system and desire to see it preserved and protected, then let your legislators know.

## Scenic Rivers Prohibitions, Permitting & Enforcement

Some activities are prohibited on or adjacent to designated scenic rivers because of their negative impacts on these rivers. These include channelization, clearing and snagging, channel realignment, reservoir construction and commercial clear-cutting of trees within 100 feet of the ordinary low water mark of a system stream.

Scenic River Permits are required for all activities on or near system streams that may detrimentally impact the ecological integrity or wilderness qualities of those rivers. These permits are not licenses and bring with them certain restrictions and conditions developed by LDWF staff to insure that a project is carried out in a manner consistent with the provisions and overall objective of the LSRA.

In the past 12 years, the Scenic Rivers Program has processed more scenic river permits than were processed in the program's first 27 years of existence (*Figure 1*). This dramatic increase is due to better coordination with our own Enforcement Division and other regulatory agencies, the department asserting itself as the lead regulatory agency on projects with the potential for impacting system streams, a deliberate effort to better actively monitor these streams, the development of relationships with non-governmental organizations concerned about the environment, and the involvement of the public. In addition, due to better coordination with other regulatory entities, we have been able to identify commercial and residential developments in their planning phases and work with their developers to incorporate measures into their projects, as well as language into their covenants, that insure their projects will not have potential for adversely impacting the Scenic River System streams they are near.

The potential for remediation of environmental impacts arising from violations of the LSRA is considerable. Two aerial photos (*Figure 2*) depict a "before and after" of a violation that occurred on Rattlesnake Branch in St. Tammany Parish. In the "before" photo, you can see that a developer realigned the stream by diverting it to a straight ditch in the left of the photo and then cleared the site and excavated two large detention ponds for a future development. In the "after" photo, you can see that the department, in cooperation with the parish and Army Corps of Engineers, identified where the stream used to be and had the developer restore not only the stream to its original configuration, but also its surrounding riparian area. That riparian area has been replanted with a tree composition developed by sampling the surrounding intact forest and remains subject to a long-term restoration plan until such time that LDWF is satisfied that the site has been adequately restored.

## Public Involvement and Agency Coordination

The Scenic Rivers Program has enjoyed a great deal of support from the legislature, other state agencies, federal regulatory entities, parish governing bodies and the public.

The involvement and interest of the legislature has resulted in the addition of new streams to the system, increased penalties for violations of the LSRA and a close working relationship with LDWF staff and individual legislators when issues involving these streams arise.

The involvement and coordination with other regulatory entities and local governing bodies has resulted in earlier recognition of potential problems, thorough sharing of information on proposed projects that might fall under our shared jurisdictions, and more efficient corrective actions when problems arise involving our overlapping jurisdictions.

The involvement of the public has been paramount to our success. Over the last 12 years, we've received over 10,000 written comments from the public expressing opinions and concerns about specific projects. On one occasion, a decision by the department to deny a permit was appealed all the way the First Circuit Court of Appeals. The department's decision was upheld throughout that process, partly relying on nearly 2,000 written comments submitted by the public relative to that activity.

Perhaps the most valuable group to the program's success has been those who own land adjacent to system streams. A Scenic River designation, while it brings with it some regulation, has come to be viewed as a very positive and exclusive classification. Some of the benefits to adjacent landowners include higher water quality protection standards, a voice in the development of proposed projects that might impact their properties and/or property values, and some assurance that the streams contributing to the value and enjoyment of their property will be protected. ■

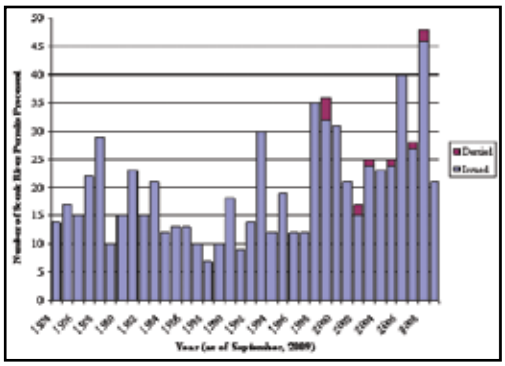


**Figure 1.** *Scenic River permit activity, 1974-2009.*

LDWF file photo

LDWF file photo

**Figure 2.** *Violation on Rattlesnake Branch in St. Tammany Parish (above). Restoration Work at Rattlesnake Branch in St. Tammany Parish (below).*

*Bayou Dorcheat in Webster Parish*

Photo courtesy of Lane Merritt

## HOW YOU CAN HELP

If these rivers are to be adequately protected, we need public involvement and support. Individuals and communities can help by using these rivers and their adjacent lands in responsible ways, initiating river cleanup projects and reporting conditions or activities that threaten these rivers to the Louisiana Natural and Scenic Rivers Program at 318-343-4045, 225-763-3587 or 225-765-2642.

In the LSRA, the Legislature also established the Louisiana Scenic Rivers Fund. The monies in this fund are generated primarily by permit application fees, site visit fees and fines assessed for violations of the act. Private contributions can also be made to the fund by anyone wishing to make a donation to support the Scenic Rivers Program. This money accumulates in the fund from year to year if it is not spent and can only be used for the acquisition of servitudes, education and monitoring and enforcement of the provisions of the Scenic Rivers Act.

Perhaps the greatest contribution that any of us can make is simply to spend time on these beautiful streams, rivers and bayous so that we can develop a genuine appreciation of their true value to our way of life and quality of life in the state of Louisiana.

# Ringed Map and Pascagoula Map Turtle

## *Survey of Bouge Chitto River in Louisiana*

**By Keri Landry, LNHP Endangered Species Biologist, and Beau Gregory, LNHP Zoologist**

The ringed map turtle (*Graptemys oculifera*) and Pascagoula map turtle (*Graptemys gibbonsi*) are medium-sized, aquatic turtles that occur in the Pearl River and one of its tributaries, the Bogue Chitto River, in Louisiana and Mississippi. The Pascagoula map turtle can also be found in the Pascagoula River system and its tributaries in Mississippi.

Ringed map turtles have a narrow head and dark olive-brown carapace with a yellowish red ring around each costal scute (scutes which fuse to the ribs). A yellow, teardrop-shaped spot can be found behind each eye with two yellow stripes radiating from the eyes back towards the neck and yellow stripes on the lower jaw. They may also be referred to as ringed sawback map turtles due to extremely raised scutes along the center of the carapace creating a serrated or saw-like appearance. These saw-like scutes are more prominent in juveniles and males than in females.

Approximate sizes for adult ringed map turtles range from 2.5 to 4.3 inches for males and 3.9 to 8.6 inches for females. Unlike females, mature males have elongated foreclaws and long, thick tails with the anal opening closer to the tip of the tail. Females become sexually mature at approximately 10-16 years and males at 3-5 years of age. Females usually nest in early summer on sandbars along rivers and may produce one to two clutches with three to four eggs annually. Ringed map turtles mostly feed on insects but may consume small fish, mollusks and carrion.

Pascagoula map turtles are broad-headed turtles with a dark olive-brown, high-domed carapace that becomes less pronounced with age. There is one vertical yellowish-orange bar on the dorsal surface of each marginal scute (scutes which form the edge of the carapace). A dark vertical line runs down the center of the carapace along prominently raised scutes jutting upwards and towards the rear of the carapace. The head pattern consists of a light yellow three-pronged blotch between the eyes which connects to a larger bright yellow blotch surrounding the outside of the eyes. This species also has more structured yellow stripes radiating from the eyes back towards the neck and less extensive yellow markings on the head than the ringed map turtle.

Although little is known of the life history of the Pascagoula map turtle, research suggests that the maximum carapace length for males is 4.9 inches and 11.6 inches for females. Males may become sexually mature in their fourth year, but it is thought that females take longer to mature. Once females reach sexual maturity, they nest in spring and summer and lay multiple clutches of approximately four to six eggs. Adult Pascagoula map turtle females are considerably larger than mature males, about twice the size. Adult males have longer, thicker tails. This species mostly feeds on insects, snails and clams.

The Bogue Chitto River is a major tributary in the lower reaches of the Pearl River System in Washington and St. Tammany parishes and contains suitable habitat for both ringed map and Pacagoula map turtles (*Figure 1*). Both species prefer wide, sandy or mud-bottomed rivers with a moderate current, open canopy and an abundance of fallen logs, stumps and brush piles for basking sites. Habitat alteration and water quality degradation reduced ringed map turtle numbers to such an extent that in 1986 it was listed as threatened under the Endangered Species Act of 1973 and state-listed as threatened in 1989. The Pascagoula map turtle has been reported as stable or possibly declining in the Pearl River and secure in the Bogue Chitto River, therefore, this species currently receives no state or federal protection. Periodic surveys are necessary to determine population trends of these turtles and, if increasing, possibly lead to delisting of the ringed map turtle. Until last year, the most recent survey for these turtles in the Bogue Chitto River was conducted in 1999 by the Louisiana Natural Heritage Program of the Louisiana Department of Wildlife and Fisheries (LDWF).

Photo courtesy of Will Selman

*Male Pascagoula map turtle.*

Photo courtesy of Robert L. Jones

*Adult female ringed map turtle.*

*LNHP personnel conducting ringed and Pascagoula map turtle surveys on the Bogue Chitto River just south of Isabel, La. in Washington parish.*

LDWF file photo

## Survey Methodology

Survey methodology from 1999 was replicated in 2009 with as similar conditions as possible to more accurately compare population levels. Various stretches of the Bogue Chitto River from LA 438 in Warnerton, La. near the Louisiana-Mississippi state line to LA 21 in Sun, La. just west of the Pearl River were surveyed for basking turtles (*Figure 2*). The entire project area was divided into smaller survey sections with start and end points consistent with access to bridge or ramp locations for a canoe and equipment. A canoe with oars was used to float downstream along each survey section, and stops were made at the upstream end of each sandbar to search for basking turtles. A pair of 10x40 binoculars was used initially from the start of sandbars to locate basking turtles and to minimize the chance for turtles to become wary and escape to the water. A spotting scope with 20-60x zoom eyepiece and mounted on a tripod was then used from somewhat concealed locations along the sandbar for identifying all turtle species along each survey site. Several locations were used to search for turtles around the entire length of each sandbar until the downstream end was no longer visible through the scope.

In 2009, surveys were conducted on June 29 and 30, and July 14, 15, 20, 21 and 23, which coincided closely with survey dates in 1999. The 1999 survey report recommended that surveys not be conducted during late summer because basking rates are expected to decrease when water temperatures rise; therefore, surveys in 2009 ceased during mid-July. GPS points were taken at the start and end of the viewing range for each survey site. Data collection included turtle species, number of individuals, age class and sex of ringed map and Pascagoula map turtles, number and size of available basking sites, and approximate percentage of habitat types (cut bank, sandbars, forested) for both the left and right descending banks of the river. Any disturbances or changes to the flow of the river since the 1999 surveys were noted on datasheets.

## Preliminary Results

The most common species observed during surveys were ringed map and Pascagoula map turtles and river cooters (*Pseudemys spp.*). Other species included one slider (*Trachemys spp.*), five individual softshell turtles (*Apalone spp.*), one eastern box turtle (*Terrapene carolina*), 45 unidentified map turtles, and 19 unidentified turtles. A total of 103 ringed map turtles and 164 Pascagoula map turtles were observed within the surveyed sites (*Table 1*). Preliminary data suggest that the upstream density of ringed map turtles may be less than densities downstream which is consistent with findings from the 1999 surveys. Ringed map turtle numbers are likely to increase considerably once survey sites downstream are completed. Ringed map and Pascagoula map turtles and river cooters frequently shared logs and debris while basking.

Research is currently ongoing to determine if air and water temperatures during fall of 2009 will allow turtles to bask, therefore, allowing surveys to proceed. An alternative will be to complete surveys in the spring/summer of 2010.

## Recommendations

Surveys will be completed and the final results will be compared to findings from the 1999 surveys to provide current population status and trends of these species. Anthropogenic changes in river hydrology that limit the availability of exposed sandbars, and decreased water quality, which limits food availability, should be minimized to prevent further declines in current populations. All work should be conducted in such a manner as to minimize impacts such as heavy runoff and siltation. Best Management Practices for Streamside Management Zones should be followed to protect exposed sandbars and maintain deadwood for basking sites.

The Bogue Chitto River is designated as a Natural and Scenic River under the LDWF Scenic Rivers Program; therefore, it is protected from clearing or snagging, and habitat conditions should be improving for map turtles. However, the ringed map turtle recovery plan requires evidence of increasing populations within the Pearl River System and its tributaries over at least a 10-year period for delisting. Periodic surveys are necessary to determine population trends. It is hoped that improved habitat conditions resulting from the Bogue Chitto River's Natural and Scenic River designation will lead to delisting the ringed map turtle in the future and keep the Pascagoula map turtle from becoming imperiled throughout the Pearl River system. ■

**Figure 1.** *In Louisiana, ringed and Pascagoula map turtles only occur within the Pearl River System in Washington and St. Tammany parishes.*

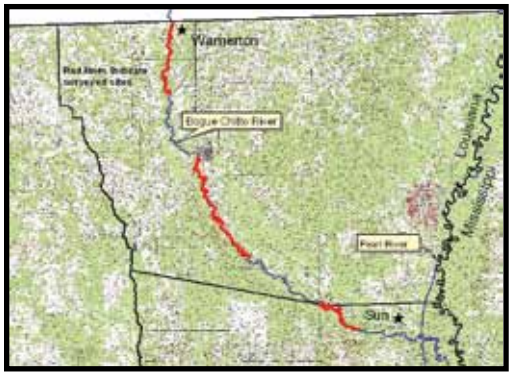



**Figure 2.** *Sites surveyed (depicted by red lines) on the Bogue Chitto River from Warnerton to Sun, La. in Washington and St. Tammany parishes during June and July 2009.*

**Table 1.** *Number of individuals of the three most common turtle species observed per survey section on the Bogue Chitto River in Louisiana from June 29 to July 23, 2009.*

| Section | # Ringed Map Turtles | # Pascagoula Map Turtles | # River Cooters | # Unidentified Map Turtles | # Unidentified Turtles |
|---|---|---|---|---|---|
| A | 7 | 9 | 9 | 2 | 9 |
| B | 32 | 48 | 49 | 19 | 8 |
| C | 27 | 49 | 17 | 12 | 6 |
| D | 37 | 58 | 40 | 14 | 8 |
| **Total** | **103** | **164** | **115** | **45** | **19** |

# WMA Youth Hunts
## *A success story*

**By Randy Myers, Habitat Stewardship Program Manager**

*Sherburne WMA Youth Waterfowl Lottery Hunt 2008-09. Note the waterfowl blind provided by LDWF in the background.*

LDWF file photo

Much has been written about the national decline in hunting and fishing license sales. The decline can be attributed to several factors that include limited access of areas to hunt or fish, increasing demands on time, complex hunting regulations, increased development and urbanization and readily available alternative recreation opportunities.

The 2006 National Survey of Fishing, Hunting and Wildlife-Associated Recreation confirmed that license sales nationally have reached an all time low. Despite being known as the "Sportsman's Paradise," Louisiana has not been immune to this decline (*Figure 1*). However, the decline in Louisiana has not been as dramatic when compared to many states.

Louisiana Department of Wildlife and Fisheries (LDWF) is responsible for the management of the state's renewable natural resources that includes all wildlife and aquatic life. Its mission is "to manage, conserve and promote wise utilization of Louisiana's renewable fish and wildlife resources and their supporting habitats through replenishment, protection, enhancement, research, development and education for the social and economic benefit of current and future generations; to provide opportunities for knowledge of and use and enjoyment of these resources; and to promote a safe and healthy environment for the users of the resources."

Maintaining Louisiana's hunting heritage is important for many reasons. For one, hunters play a critical role in the conservation of wildlife, because their hunting license fees are essential to the accomplishment LDWF's mission. Therefore, LDWF must continue to recruit and retain hunters if it is to operate without using general revenue funds.

Recent research has pointed to the need to encourage youth to participate in outdoor activities. In fact, in the book *Last Child in the Woods*, author Richard Louv, who coined the term "nature deficit disorder," highlights the benefits children derive from having exposure to nature and the outdoors. We believe that there is no better way to accomplish this than to teach a child to hunt or fish.

To help fulfill its mission, LDWF manages 61 wildlife management areas (WMAs) and refuges that total nearly 1.5 million acres. The management of these areas involves wildlife habitat enhancement and infrastructure improvement to accommodate public use. Typical activities include road and bridge construction and repair, vegetation control, tree planting and harvesting, water control structure operation, pump station operation, and boundary maintenance.

WMAs and refuges provide quality outdoor consumptive and non-consumptive opportunities including hunting, fishing, trapping, bird watching, hiking, camping and boating. Over the past five years, an average of more than 800,000 user days per year was recorded on the WMAs and refuges. These properties also provide a wonderful place to encourage youth participation in hunting.

Recognizing the importance of continuing a hunting heritage in our state, LDWF initiated a variety of outreach opportunities directed at recruiting youth hunters. One of those opportunities was an expansion of youth hunting on the WMAs. Expanded youth hunting seasons on WMAs include small game, white-tailed deer, waterfowl and wild turkey. In addition, the age to participate in youth hunts was recently increased to include youths 17 years old or younger (with the exception of the youth waterfowl hunts which are established by the U.S. Fish and Wildlife Service and restricted to youths 15 and younger).

LDWF offers a variety of youth hunts on the WMAs. These hunts range from traditional hunts, where the WMA is open to all youths, to specialized, personnel intensive lottery hunts where LDWF provides stands, blinds and guides.

One of the first youth hunts on the WMAs occurred on Sandy Hollow WMA. Each year on the opening day of the dove season, the north end of the area is restricted to youths 17 or younger and a supervising adult who must be 18 years or older. Adults can enjoy the hunting experience with the youth. The hunts have been extremely popular as evidenced by the high turnout of hunters and smiling faces.

Youth lottery hunts by nature limit the number of participants. This helps to maximize the hunting experience by minimizing competition for space, thus creating an atmosphere for quality hunting. Potential participants have to apply for these hunts, and successful applicants are randomly selected by a computer drawing. These hunts also have become extremely popular as evidenced by the number of applications received each year.

One such lottery hunt, initiated in 2005, occurs on Sherburne WMA. Youth lottery

waterfowl hunts occur in the waterfowl refuge on the North Farm portion of the WMA. This area is intensively managed for waterfowl and provides a place for waterfowl to rest and feed. The hunting is limited to only three days during the waterfowl season. A total of six youths per day are drawn. LDWF provides the blinds, decoys, guide and transportation to the blind from a predetermined location. Since the inception of the hunt, a success rate of 5.42 ducks per hunter has been achieved - not bad considering that the daily limit for ducks is six.

Similarly, the WMA youth turkey lottery hunts are quite popular, and youth hunters are successful. With the assistance of the National Wild Turkey Federation, LDWF initially conducted these hunts on several WMAs. More recently, the youth turkey hunts were expanded to 13 WMAs. And in 2009, a total of 115 youth participated with 27 turkeys harvested for a success rate of 1:4.26. Fort Polk WMA has had particularly successful hunts. Last year, 20 youth hunters harvested seven turkeys; others had the opportunity to bag a bird but didn't.

However, success rate only reflects the harvest side of hunting. Youths also had the opportunity to truly experience turkey hunting. Participants are instructed in the art of scouting, calling, listening and locating turkeys by guides before the hunt so that they will better understand and appreciate the tradition. For some, these hunts are their first experience in the woods prior to daylight. Their other senses, such as hearing or even smell, become much keener when sight is taken away or diminished as it is in the pre-dawn hours. The sounds and smells of the woods coming alive is an amazing experience in itself. However, on that spring morning in 2009, most youths not only heard the woods come alive, but also wild turkeys gobbling.

LDWF file photo

*Fort Polk WMA Youth Turkey Lottery Hunt 2009.*

Youth squirrel hunts are held on Bodcau, Boeuf, Clear Creek, Jackson-Bienville, Little River, Pearl River, Russell Sage, Sandy Hollow, Sherburne, Spring Bayou and West Bay WMAs. These hunts occur on the last Saturday of September and provide an opportunity for youth hunters to harvest squirrels before the regular squirrel season. In addition, a first-time youth lottery squirrel hunt was held on Floy McElroy WMA this fall. It is designed to provide a quality hunting experience on an area that does not allow squirrel hunting for the remainder of the year.

A youth lottery rabbit hunt, another first-time youth event, will be conducted on Floy McElroy, Sherburne and Red River WMAs during the 2009-2010 hunting seasons. These hunts are being conducted to introduce youth hunters that normally would not have the opportunity to hunt with beagles and to encourage small game hunting.

Youth hunting opportunities are not limited to the WMAs. Statewide youth hunt weekends for deer and turkey are established each year. A special youth shotgun season on private land is available during the primitive weapon season in each deer hunting area. We encouraged you to promote youth participation in hunting and in the outdoors.

While the success of the youth hunts in recruiting and retaining youth in hunting is still open for discussion, there is no denying the success youth hunts have had in providing a quality outdoor experience for the hunters of tomorrow. However, without the opportunity and a place to enjoy the outdoors, the youth of today will continue to suffer from "nature deficit disorder." ■

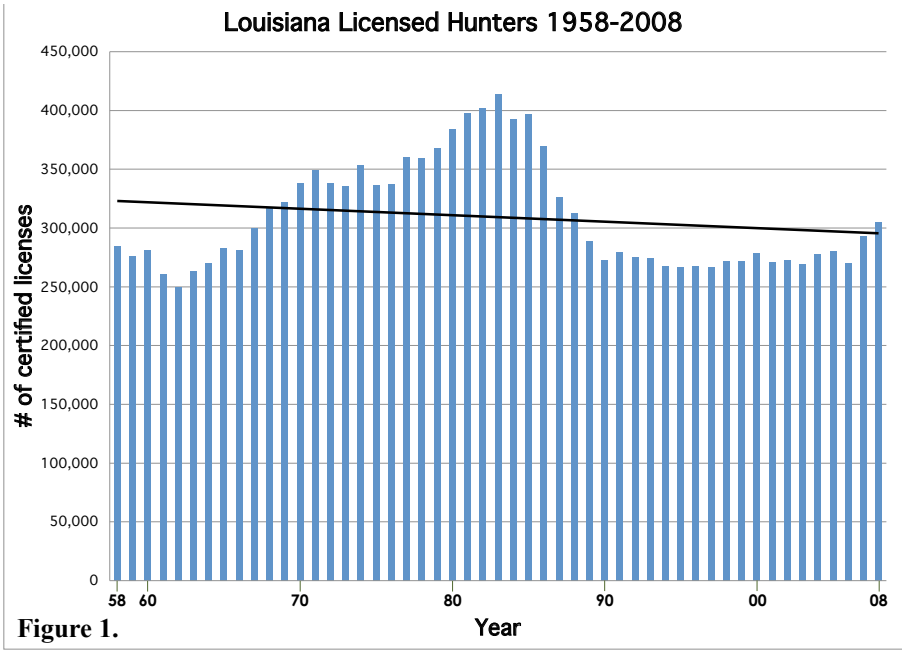



**Figure 1.**

**FOR MORE INFORMATION**

For additional information concerning youth hunting opportunities contact your local LDWF office or visit the website at *www.wlf.louisiana.gov.*

# Youth Handicapped Hunt

This year a number of events transpired that made a hunt during the special Youth and Physically Challenged Hunt held on the Buckhorn WMA especially memorable for a young man, 14-year old Devan Temple. Devan suffers from Duchene Muscular Dystrophy. The disease, which causes muscle degeneration, has progressed such that it restricts his mobility to his fingers and head only. As a result, special equipment is needed for him to be able to shoot a firearm. After an initial plan to borrow the equipment fell through, Dransco Oil Specialty Company donated the money to Devan's family for purchase of the device and the manufacturing company, Be Adaptive, was able to quickly modify one of their products to meet his needs.

Devan and his father showed up for the hunt on the Friday morning after Thanksgiving full of excitement. Not only had it initially appeared that Devan wouldn't have the necessary equipment to participate in the hunt, but this was his first hunt. The morning hunt was relatively uneventful, but Devan was still raring to go in the afternoon. Shortly after being placed at the stand the second time, a doe appeared at the far end of the food plot and Devan took the shot. Although he thought he made a good shot, his father was not as optimistic. They used the two-way radio that each participant is issued to communicate with our personnel when a deer is shot or assistance is otherwise needed. After a search that extended into the night and hope was waning, our personnel found the impressive 158 pound doe that Devan had killed. ■

LDWF file photo

# Well-Traveled White Front Taken at White Lake WCA

**By Larry Reynolds,**
**LDWF Waterfowl Program Leader**

Cordell Haymon didn't know how special this bird was or he'd have at least taken some photos prior to preparing it for a future meal.


White-fronted geese, or specklebellies as they are more commonly called, are well-known among waterfowlers as outstanding table fare, but maybe not this one.

Cordell and his brother, Brian Haymon were hunting together on Jan. 6, 2009 at LDWF's White Lake Wetland Conservation Area after being selected in the lottery for a hunt on the area's marsh unit. During the successful duck hunt, a flock of nearly a dozen specklebelly geese warily skirted wide of the decoys at the very edge of shotgun range. "I chose the nearest bird, the second from the back, and knocked it down as they banked away," said Cordell. "Seeing the band on its leg when the guide retrieved the bird made it even more memorable." He reported the numbers on the band to the USGS Bird Banding Laboratory shortly thereafter so the information can be used to assist management of white-fronted geese in North America.

When a certificate of appreciation from the Bird Banding Laboratory arrived a few weeks later, Cordell found out that the bird was banded in August of 1993 in Nunavut, Canada, north of the Arctic Circle and over 2,700 miles straight-line distance from White Lake WCA. Furthermore, the female was an adult when banded meaning that she was at least in her 17th year and had probably made the trip to Louisiana at least 17 times. A check of the Bird Banding Lab's website at *http://www.pwrc.usgs.gov/bbl/homepage/long1290.cfm* shows the longevity record for banded greater white-fronted geese to be 23 years, but Cordell's bird may well be in the top 10. She had certainly covered many miles over the mid-continent of North America in her long life.

And how did she eat? "Once I knew I had a very old bird," Cordell said, "I used it in a gumbo, and it was very good, maybe a little chewy, but very good." ■

# State Agencies Assist with Career Development Events

**By Cody Cedotal, LDWF Forest Stewardship Biologist**

The Future Farmers of America (FFA) is an organization that has introduced high school students to careers associated with agriculture for many years. Through FFA, agriculture teachers can utilize curriculums related to cattle, poultry and swine production, horticulture, electrical engineering, small engine repair, welding, and many others that expose students to activities associated with agriculture. In many instances, students will compete against one another in local and state fairs and career development events to hone skills necessary for a career in one of these fields.

On Oct. 2, 2009 this effort was continued when the Area IV FFA Forestry Career Development Event (CDE) was held for schools in southeast Louisiana at the LSU AgCenter, Idlewild Research Plantation near Clinton. The event is one of four local forestry competitions held each year throughout the state. The Forestry CDE consists of six different events, all of which incorporate skills important to forest management. The compass and pacing portion of the CDE requires students to navigate a staked course and provide bearings and distances between each point. Map reading requires that students identify outlined parcels of land by section, township and range on a 1:24000 quad map. Students are trained to identify as many as 40 common tree species and taught their scientific names in preparation for the tree identification event. In the timber stand improvement event, students are required to simulate tree marking (cut or leave) in a stand of trees based upon described landowner objectives. Lastly, students measure diameters and merchantable heights of sawtimber and pulpwood trees to determine per-acre volume estimate for both products.

Approximately 120 FFA members participated in this year's Area IV event. Agriculture teachers from Maurepas, Springfield, Albany, Franklinton, St. Amant, Fountainbleau, Loranger, Pearl River, and Live Oak high schools and Fifth Ward and Creekside junior high schools brought teams to the CDE. Each team had four members in the contest, and many schools had two teams in the competition. The top five teams from each area compete in the state forestry CDE, which is usually held in November each year. This year's top five consisted of multiple teams from Springfield High (1st and 3rd place) and Franklinton High (2nd and 4th place) as well as a team from Fifth Ward Junior High (5th place).

There is a large amount of work necessary to organize and prepare for all CDEs. For the past several years, Brian Chandler, Area Extension Forester for the LSU AgCenter has taken on this task with assistance from Dr. Ronald Mayeux, Executive Secretary of the Louisiana Association of FFA. Other assistance in contest set-up and event supervision has been provided by Dr. Don Reed, Ken Spoto, James Deviller, and Dearl Sanders, LSU Agcenter; Mike Thomas, David Cambell, Eric Clark, Waylan Bennet, Jay Meadows, and Henry Childres, Louisiana Department of Agriculture and myself for the Louisiana Department of Wildlife and Fisheries. A special thanks to all who supported the event and to those local agriculture teachers who took the time to train students and participate in the Area IV and other Area FFA Forestry CDEs.

I participated in the Area IV FFA Forestry CDE and state CDE as a student of Denham Springs High from 1991 through 1994. Although I always had an interest the outdoors, these contests were my first exposure to forestry and really motivated me to pursue a career in forestry/wildlife. I went on to graduate from LSU in 1998 with a degree in forestry and ultimately to work in my current position as the Forest Stewardship Biologist for the Louisiana Department of Wildlife and Fisheries. I have been involved with the Area IV Forestry contest for more than 10 years, either by training students at Denham Springs High or assisting in organizing the contest. I feel the FFA and its programs are vital to exposing students to forestry and other agriculture-related fields and worthy of all of our support. These programs are becoming increasingly more important as the state transitions from rural to urban. Support of your local FFA may inspire a student to become a consulting forester, wildlife biologist, county agent or other natural resource professional who one day may provide management assistance to you. ■

LDWF file photos

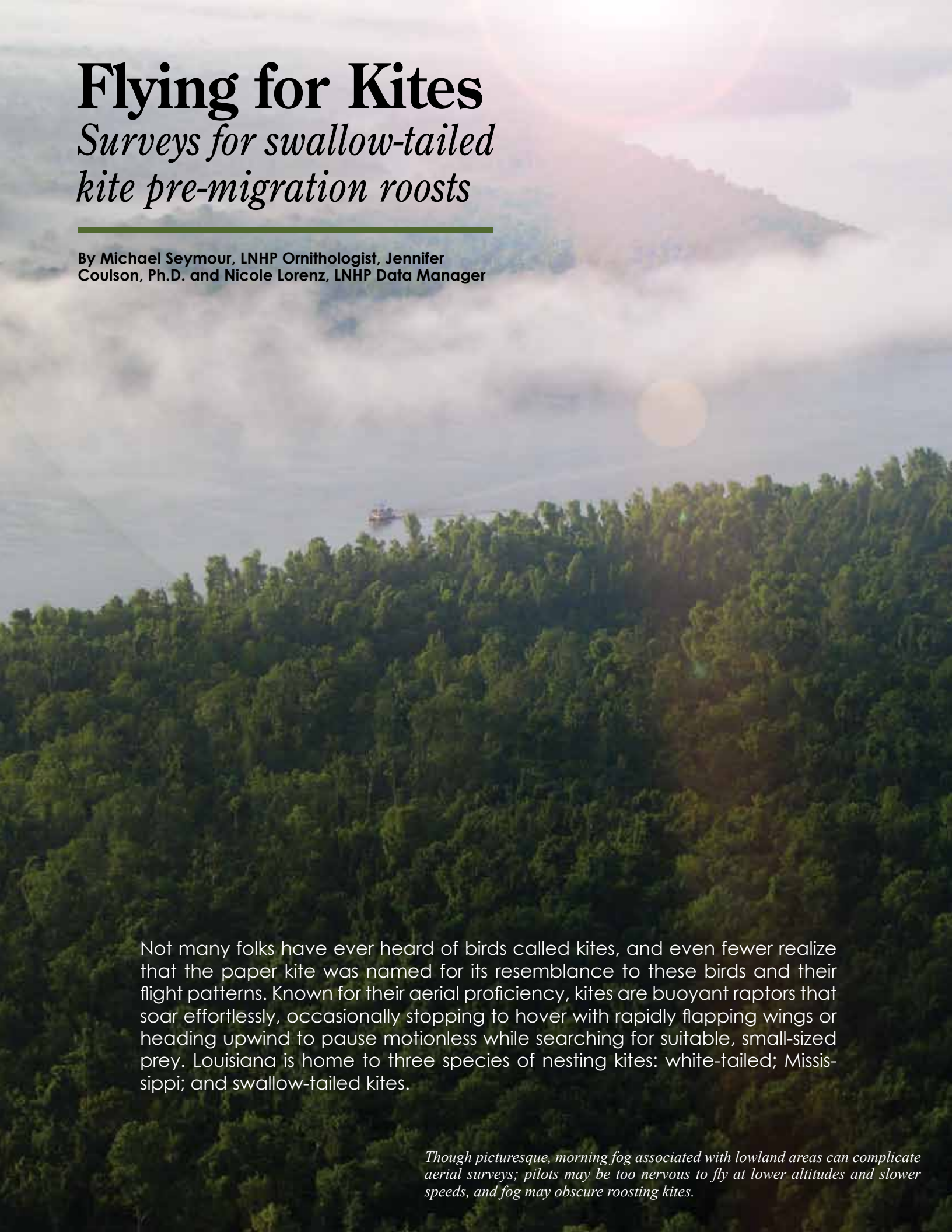
**Pulpwood Heights.** *Students measure merchantable heights during pulpwood event*

**Compass and pacing.** *Students determine bearings and pace distances on the compass and pacing course.*

# Flying for Kites

## *Surveys for swallow-tailed kite pre-migration roosts*

**By Michael Seymour, LNHP Ornithologist, Jennifer Coulson, Ph.D. and Nicole Lorenz, LNHP Data Manager**



Not many folks have ever heard of birds called kites, and even fewer realize that the paper kite was named for its resemblance to these birds and their flight patterns. Known for their aerial proficiency, kites are buoyant raptors that soar effortlessly, occasionally stopping to hover with rapidly flapping wings or heading upwind to pause motionless while searching for suitable, small-sized prey. Louisiana is home to three species of nesting kites: white-tailed; Mississippi; and swallow-tailed kites.

*Though picturesque, morning fog associated with lowland areas can complicate aerial surveys; pilots may be too nervous to fly at lower altitudes and slower speeds, and fog may obscure roosting kites.*

Photo courtesy of MA Seymour

Photo courtesy of NF Lorenz

*Swallow-tailed kite pre-migration roosts can occur scattered throughout river basins. The Atchafalaya River basin is crisscrossed with rivers and bayous, providing kites ample hiding places to confound surveyors.*

*This roost of 21 birds (left) was discovered in the Atchafalaya Basin in 2009.*

Whereas the white-tailed kite is a recent invader from the west, and the Mississippi kite appears to be fairing well in our state and even expanding its range elsewhere, the swallow-tailed kite is a critically imperiled species in Louisiana. Swallow-tailed kites once ranged in perhaps 21 states from Minnesota to the Gulf Coast and Texas to the Carolinas, but now are found in only eight southern states. Most of the former range was vacated by the kites by 1940. As with many bird population declines, the exact causes are unknown, but several possibilities exist, including alteration and destruction of habitat and human persecution on the breeding grounds in the U.S. and on the wintering grounds in South America. In fact, despite slowly changing perceptions of raptors, swallow-tailed kites are still shot out of ignorance and misinformation. Unfortunately, this type of situation presented itself to Louisiana Department of Wildlife and Fisheries (LDWF) biologists last year when a kite was shot for allegedly killing Eurasian collared-doves - faulty logic, for sure. Removing exotics which may compete with native species is supported by biologists and conservationists, but swallow-tailed kites would likely never attack an animal of that size. (As a side note, the perpetrator was caught, brought to federal court and fined. Swallow-tailed kites and all other native birds of prey are protected by the federal Migratory Bird Treaty Act.)

Swallow-tailed kites eat invertebrates like large grasshoppers or dragonflies, or small vertebrates like snakes, lizards, frogs, tree-roosting bats and the occasional nestling bird. They also have an interesting habit of grabbing wasp nests on the wing, out-flying the adult guards, and consuming the larval wasps. In fact, all food is captured and eaten on the wing, the kite's long, forked tail acting as the perfect rudder. Few other Louisiana birds are so aerial in nature, and few are as easily identified by novice birders. The flight silhouette and color scheme of a swallow-tailed kite is almost unmistakable; its large size (approximately 20 inches - much of which is tail length) combined with long, tapered wings, a dramatically split tail, and a black-and-white color scheme make this bird easy to recognize. Novice birders occasionally mistake Mississippi kites for swallow-tailed kites, but the former have square tails. Swallow-tailed kites are sometimes also confused with magnificent frigatebirds, a pelagic species which occasionally flies inland to avoid tropical storms. Partly because of rarity, but mostly due to the species' "wow factor," many out-of-state birders request where to see swallow-tailed kites when they visit our state.

In Louisiana, kite-seeking birders would best spend their time at either of two LDWF properties: Sherburne Wildlife Management Area or Pearl River Wildlife Management Area. Indeed, these two major river basins, the Atchafalaya and the Pearl, are home to the two largest subpopulations in Louisiana. Kites may also be found in the Sabine and other drainages and waterways during nesting, and migrants may show up statewide. Migration routes are not fully understood, but we do know, thanks to telemetry studies, that most U.S. kites funnel out the tip of Florida in fall migration (actually late summer) and some follow the western edge of the Gulf of Mexico through south Texas.

During all times of the year, kites are extremely social, forming sizeable roosts each evening especially at the conclusion of nesting season. But even during nesting, kites are highly gregarious, forming "nesting neighborhoods," where two to seven kite pairs may nest within one mile of each other, and feed in small to very large groups. The largest nighttime roosts are formed just prior to fall migration and provide kite researchers the rare opportunity to quantify a large percentage of U.S. kites within a span of a few days. Over a period of a few years, such surveys would allow scientists to monitor the U.S. kite population to determine if the species' numbers are increasing, decreasing or stabilizing.

For the past several years, a few southern states have performed aerial surveys to count the number of kites in pre-migration roosts, most notably Florida and Louisiana; the first aerial roost surveys in Louisiana were conducted in 1997 over the Pearl River drainage. Florida's roosts are the largest, occasionally numbering into the thousands of individuals, probably harboring more than half of the U.S. kite population at times. Louisiana's roosts are modest in comparison, but no less important. The largest roost documented for Louisiana to date was found in 2003 on the banks of the West Pearl River and contained 108 kites. In some years, the total number of kites roosting in the lower Pearl drainage, including both the Louisiana and Mississippi sides, has been in excess of 200 kites. Most roosts

Photo courtesy of NF Lorenz

are situated just inside wooded edges near major waterways like bayous or rivers and utilize some of the tallest trees in the landscape. Both live and dead trees are used by roosting kites, with an apparent preference to dead limbs, although this could be detection bias. In addition to monitoring the number of birds, identifying roost sites may be an important step in the protection and conservation of the species.

## The First Cooperative Region-wide Study

The Swallow-tailed Kite Conservation Alliance, formerly called the Swallow-tailed Kite Working Group, is a group of concerned citizens and scientists from non-governmental conservation agencies, private lands, and state and federal wildlife agencies. The goal of the alliance is to steer research and conservation actions to recover existing kite populations and to assist landowners in sustaining habitats needed for nesting, feeding and roosting. In October 2007, the alliance unanimously recognized the need for more robust studies, as previous work, although invaluable for advancing our understanding of the species, lacked the cohesion needed to estimate kite numbers across the range. States agreed that surveying for kites synchronously and during the peak of Florida's largest roosts (where most of the U.S. population aggregates at this time) was the best method for monitoring population trends over time, and might possibly provide a basis for a rough estimate of the total U.S. population.

In 2008, a State Wildlife Grant (SWG) project was funded through the U.S. Fish and Wildlife Service (USFWS) with matching funds from LDWF and Orleans Audubon Society, which allowed Louisiana to survey for kite pre-migration roosts in three river basins: the Pearl; the Atchafalaya; and the Sabine. Initially funded for two years, the project has recently been extended a third year (into summer 2010).

Like most departmental aerial surveys, the roost surveys have been performed in small, single-engine planes, usually a Cessna 150, 172 or 182. Because all survey dates were arranged to match those of all other states in the region, occasional scheduling problems occurred, namely mechanical issues with planes or adverse weather conditions. On such occasions, some flights were canceled, freeing monies for additional training or reconnaissance flights later. Three flights were scheduled for each basin during the same dates on which Florida's (and other states') researchers were flying. Each plane carried a pilot and two observers seated on opposite sides of the plane. Usually, one observer navigated, while the other observer recorded. Unlike most other aerial surveys which can be performed throughout the day, kite surveys must be performed from first light to approximately 9:00a.m., when the kites start to leave roosts.

In contrast to waterfowl or rookery surveys where concentrations of birds are usually fairly obvious from the air, kite roosts can be extremely cryptic, as birds may be perched beneath the canopy in heavily foliated trees. When perched on dead trees or dead limbs of live trees, the birds' white heads and undersides stand out well against a dark green backdrop, but sub-canopy, those same white parts may appear to be tree bark dappled by filtered sun light. Frequently, multiple passes near the same roost are required, because counting the white dots from the air becomes quite a challenge as the angle of light changes during the flybys. Surveyors are careful not to disturb the roosting birds, since causing the birds to leave the roost may cause abandonment and wastes the birds' energy needed for migration. Survey planes are therefore kept several hundred feet away from the roosts and never pass directly above a roost. In addition to tricks of light, should rain showers occur the evening before the survey, roosts can be greatly scattered, as the kites will put down for the night without searching out the company of others. Detection bias compounded with passages of rain showers the day before surveys can greatly underestimate the actual number of kites.

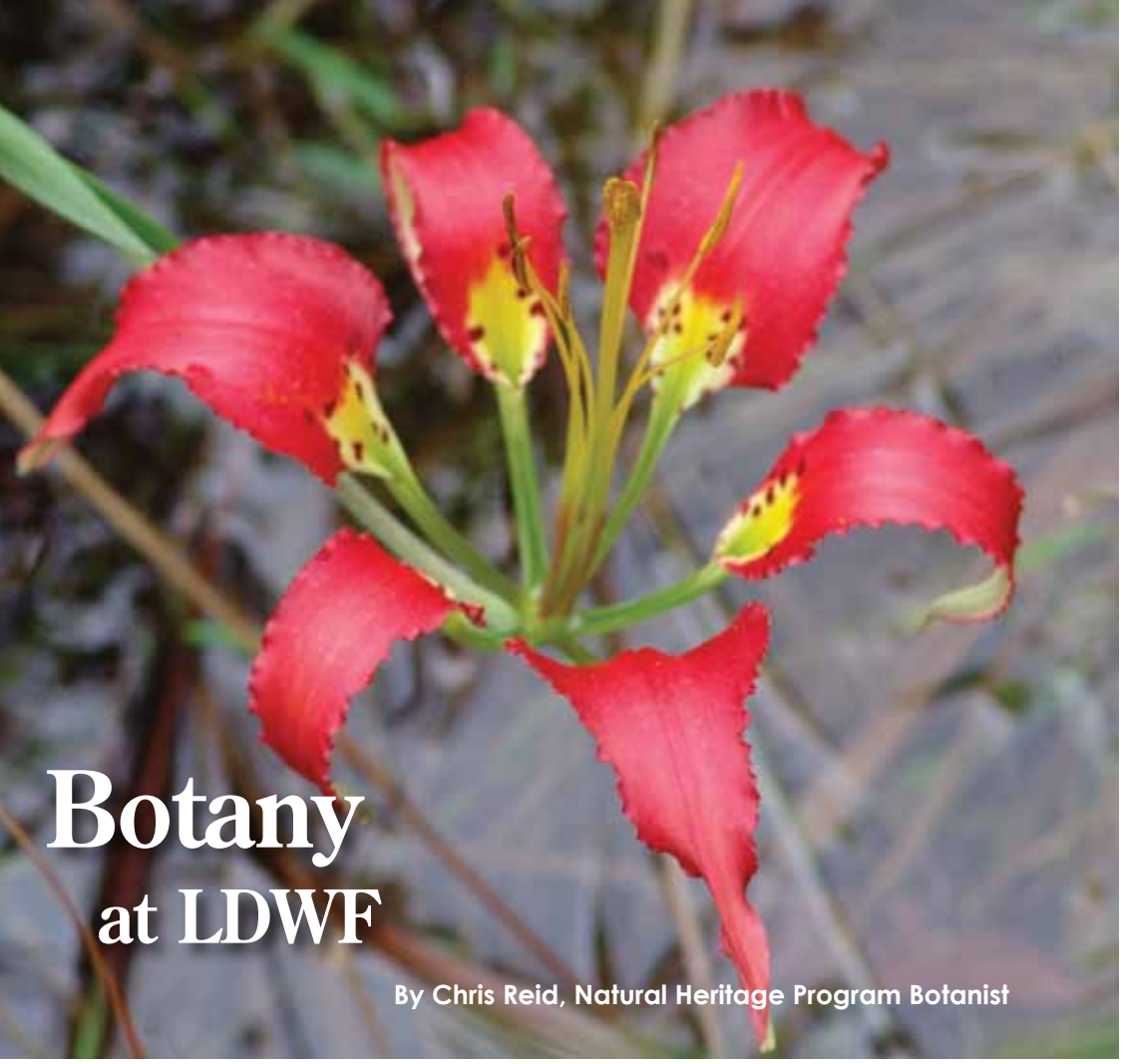
Nevertheless, despite occasional setbacks from weather or mechanical difficulties, the swallow-tailed kite pre-migration roost survey pilot work in 2008 and the region-wide effort in 2009 were tremendous successes. Several new roosts were discovered in all three basins surveyed in Louisiana; in fact, the 2008 survey documented roosts in the Sabine River Basin for the first time. Preliminary results are encouraging, and such a survey method is a viable way to measure the number of kites roosting in Louisiana river basins. It is important to note that these surveys cannot be used to estimate number of nesting kites in Louisiana, because birds roosting in our state may actually nest in neighboring states. Telemetry studies performed after the nesting season in Louisiana and Florida showed that kites are highly mobile, frequently traveling great distances from their nesting territories during their pre-migration period. These study results should prove helpful in monitoring populations and providing assistance in conservation of this rare species, perhaps, the rarest of U.S. birds lacking protection under the federal Endangered Species Act of 1973.

Surveys and data analyses funded through SWG for swallow-tailed kite pre-migration roosts should conclude in late 2010. A full report will be made available to interested parties at that time. You can assist researchers studying the swallow-tailed kite by reporting nests and roosts to: Jennifer Coulson at Jacoulson@aol.com or by calling 504-717-3544.

LDWF and Orleans Audubon Society would like to thank USFWS for their commitment to this project, and we thank our dedicated volunteers: Tom Coulson; Sherry DeFrancesch; Jessica Evans; Whitney Gayle; B. Mac Myers; and Joshua Sylvest.

Photo courtesy of NF Lorenz

*I-10 cuts a path through the vast Atchafalaya Basin, the largest remaining block of contiguous bottomland hardwood forest in North America.*



# Botany at LDWF

By Chris Reid, Natural Heritage Program Botanist

*Earth-fruit (above), southern red lily (left) and Texas saxifrage (below)*

LDWF file photos

Photo courtesy of Sue Wilder

Botanical research at the Louisiana Department of Wildlife and Fisheries (LDWF) focuses primarily on determining which members of our native flora are rare and then locating, mapping and documenting rare species through field surveys and secondary sources (e.g. herbarium specimens, literature). The Louisiana landscape supports approximately 2,400 native plant species and an additional 800 non-natives. Currently, there are 384 species on the rare plant tracking list. This list usually is revised annually and can change as we learn more about the native flora. Field studies are also aimed at increasing the knowledge of specific habitats through complete botanical inventory work.

While Louisiana has been fairly well-explored botanically over the past several decades, the true status of many of our native plants is poorly known and field studies remain important. There are still many exciting botanical discoveries yet to be made in Louisiana. For example, in the past few years, LDWF staff has found 10 new native species records for the state. One these is Texas saxifrage (*Saxifraga texana*), which was discovered in 2007 in two saline prairies near Shreveport. Finding new occurrences of globally rare plants does still happen and is very exciting. Recent floristic studies of natural communities conducted by LDWF staff and colleagues have focused on saline prairies and Morse Clay calcareous prairies with the results being published in peer-reviewed journals. Both of these communities are small-scale natural grasslands that occur in the northwestern part of the state. Monitoring of the federally-listed earth-fruit (*Geocarpon minimum*) has been carried out for the past three years. Earth-fruit is a tiny plant that occurs on saline prairies in northwest Louisiana. We hope to continue this monitoring annually for at least 10 years to determine trends in population levels and stability, thereby adding to our knowledge and understanding of the ecology of this rare plant and its habitat. Other projects under way include a detailed study of flora and soils of saline prairies in northwest Louisiana, a study of the flora of a marsh-fringing coastal prairie at White Lake Wetlands Conservation Area, and surveys of flatwoods ponds in southwest Louisiana and longleaf pine savannahs on both sides of the Mississippi River.

Rare plant information can be accessed through the LDWF website. The botany materials may be accessed by navigating to the LDWF home page (*www.wlf.louisiana.gov*) and then selecting the headings entitled "Experience Wildlife," then "Natural Heritage," and then "Rare Plants." Resources available include the rare plant tracking list, fact sheets for globally imperiled plants and rare plants of the coastal zone, and photos of many species. Revision of the botany web page is currently in progress. The revisions are aimed at consolidating information and improving access.

In addition to emphasizing rare species, I also perform plant identification within the department and for the public. Since plants are so obviously important to wildlife, time spent providing technical assistance can be substantial. Identification requests involve all manner of materials ranging from fresh samples, to seeds taken from duck crops, to vegetative material obtained from deer rumen samples. Most identification requests come from within the department or from environmental consultants. I would welcome more general interest plant identification requests from the public. If there is a plant you are curious about, take a digital image and email it to me, or bring in a sample. I can be reached at 225-765-2828 or creid@wlf.louisiana.gov.

# Coastwide Nutria Control Program

By Paul Provence, Fur and Marsh Management Biologist, and Edmund Mouton, Fur and Marsh Management Program Manager

## Introduction

The nutria (*Myocastor coypus*) is a large semi-aquatic rodent, indigenous to South America. The first introduction of nutria to North America occurred in California in 1899; however it was not until the 1930s that additional animals were introduced in seven other states, including Louisiana. These importations, primarily for fur farming, failed as a result of poor reproductive success. After the failures of these fur farms, nutria were released into the wild. As a result, 16 states now have feral populations of nutria.

Nutria breed year round and are extremely prolific. Sexual maturity may vary with habitat quality; however, males reach sexual maturity between 4-9 months and females reach sexual maturity between 3-9 months. Females also can breed within a day of having a litter. With a gestation period of only 130 days, in one year, an adult nutria can produce two litters and be pregnant for a third. The number of young in a litter ranges from one to 13 with an average of 4.5 young. Litter size can vary with age of female, habitat quality and time of year. At birth, nutria are fully furred and their eyes are open. Newborns feed on vegetation within hours, but also nurse for up to eight weeks.

Nutria harvest in Louisiana was not appreciable until a concerted effort to develop a market for the pelts was successful. Until then, nutria damage was being increasingly reported on agricultural lands in southern Louisiana, and trappers were blaming nutria for reduced muskrat populations. Annual nutria harvest was over 1 million animals from 1961-1979. However, because of the depressed economy in Russia and the Far East, harvest was generally below 300,000 from 1988-2002.

As nutria harvest declined, reports of marsh vegetation damage by land managers became common again. Such complaints began in 1987 and became more frequent during the early 1990s. In response, the Coastal and Non-game Resources Division (CNR), formerly known as the Fur and Refuge Division, initiated limited aerial survey flights, particularly in southeastern Louisiana. Survey flights of Barataria and Terrebonne basins were conducted during the 1990s with initial support from Barataria-Terrebonne National Estuary Program (BTNEP) and later support from Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA). These flights recorded increasing marsh damage from herbivory. Marsh loss impacts Louisiana citizens economically and recreationally, and decreases flood protection. In order to remove the threat of land loss due to nutria, the Coastwide Nutria Control Program (CNCP) was developed in January 2002.

The project is funded by CWPPRA through the Natural Resources Conservation Service and the Louisiana Department of Natural Resources with the Louisiana Department of Wildlife and Fisheries (LDWF) as the lead implementing agency.

## Implementation

The program area is coastal Louisiana, bounded to the north by I-10 from the Texas state line to Baton Rouge, I-12 from Baton Rouge to Slidell, and I-10 from Slidell to the Mississippi state line. The project goal is to significantly reduce damage to coastal wetlands attributable to nutria herbivory by removing 400,000 nutria annually. This project goal is consistent with the Coast 2050 common strategy of controlling herbivory damage to wetlands. The method chosen for the program is an incentive payment to registered trappers/hunters for each nutria tail delivered to established collection centers. Coastal Environments Inc. (CEI) was selected through the competitive bid process as the contractor to develop and maintain the program database, collect nutria tails and distribute incentive payment checks to participants for tail harvests. Initially, registered participants were paid $4 per nutria tail. To encourage participation, the payment was increased to $5 per tail in the 2006 season.

Prior to trapping season, individuals interested in participating in the CNCP submit applications to CNCP staff at the LDWF New Iberia Office. In order for a participant to qualify, the individual must complete the application form, obtain written permission from a landowner or land manager with property in the program area, complete a W-9 tax form and provide LDWF with a complete legal description of the property to be hunted or trapped and a map outlining the property boundaries

## Harvest Results

Louisiana's open trapping season begins each year on Nov. 20 and runs through March 31. Trapping efforts normally peak between January and March when nutria are most active. Vegetation dieback provides better access to and visibility in the nutria's preferred habitats for trappers and hunters. Over the past seven years of the program, annual nutria harvest has averaged approximately 300,000. To date, almost 2.5 million nutria have been harvested through this program, and $9.5 million in incentive payments have been paid to the participants. The CNCP has averaged approximately 300 active participants annually. Of these participants, approximately one-third of them harvest over 800 nutria annually per hunter, with some participants harvesting over 5,000. Generally about half of the participants' preferred method of take is shooting nutria with a rifle, and slightly less than half of the participants prefer to set traps. A few participants use shotguns. Most of the nutria harvested are from fresh marshes in the southeastern half of the state with Terrebonne Parish having the highest harvest. Terrebonne Parish and the Barataria-Terrebonne Estuary are experiencing some of the most rapid land loss rates in the state, and removal of nutria from these areas is critical.

## Wetland Damage Assessment

The annual coastwide nutria herbivory survey is normally conducted in April when "green-up" occurs and nutria activity begins, and damage is most apparent. A total of 155.25-mile wide transects (about 2,350

miles) spaced at approximately 1.8 miles intervals are surveyed using helicopters at an altitude of about 300-400 feet starting at the swamp-marsh interface and continuing south to the beginning of the salt marsh. Due to low nutria population density, salt marsh habitat is not included in the survey. The location of each site with damage and its extent is documented. In addition to searching for newly damaged sites, all previously identified damaged sites are reassessed.

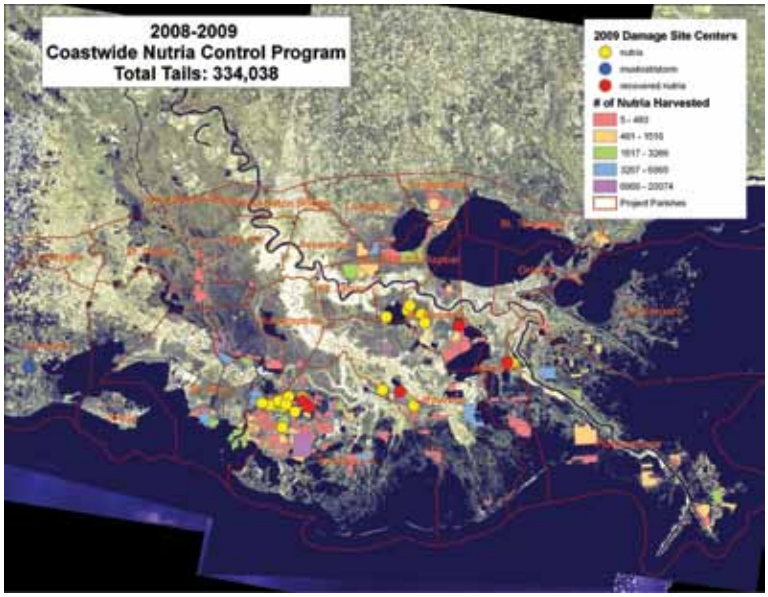
Fresh marsh continues to be the most affected by nutria herbivory (about 93 percent of the affected areas). The typical vegetation impacted in fresh marsh is spikerush (*Eleocharis spp*.) and pennywort (*Hydrocotyle spp*.). Three-cornered grass (*Schoenoplectus americanus*; formerly *Scirpus olneyi*) and spikerush are commonly impacted plant species in intermediate and brackish marshes. However, the trend in both reduced damage acreage and increased marsh recovery are significant.

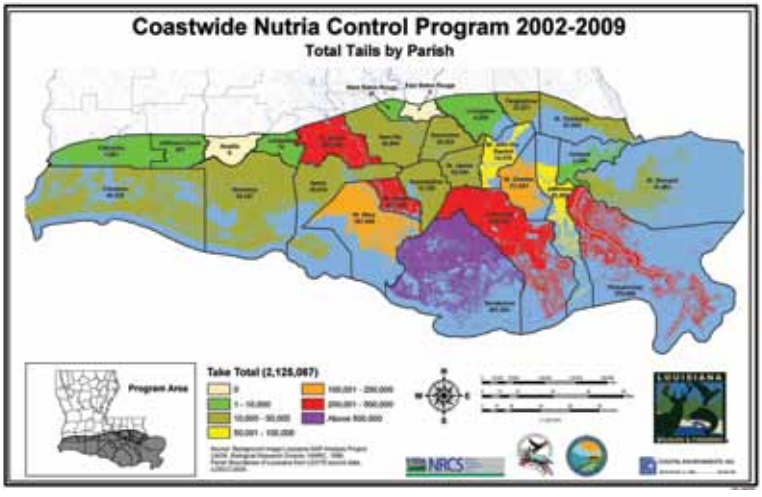
The 2009 vegetative damage survey yielded a total of 5,422 acres of nutria damage along transect lines. Due to the distance between survey lines, all areas impacted by nutria herbivory cannot be identified. Thus, the observed value is extrapolated. The 2009 coast wide estimated damage was 20,333 acres. When compared to 2008 (6,171 acres or 23,141 acres extrapolated coast wide), there was approximately a 12 percent decrease in the number of damaged acres from the previous year and a near 80 percent reduction from the approximately 105,000 damaged acres observed in the 1999 aerial survey. ■

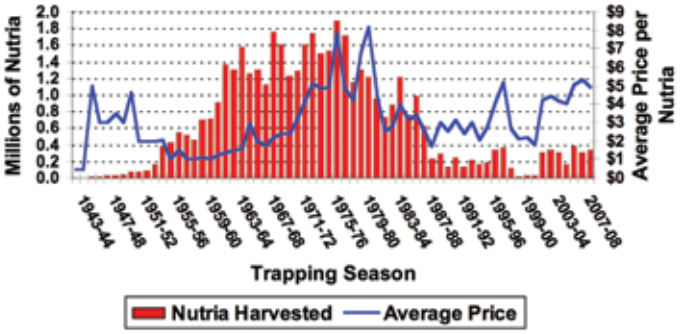
## FOR MORE INFORMATION

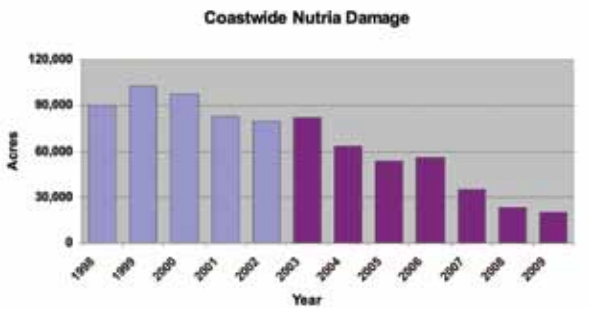
For additional information contact Paul Provence or Edmond Mouton at the New Iberia Office: 337-373-0032 or you may visit the website *www.nutria.com*

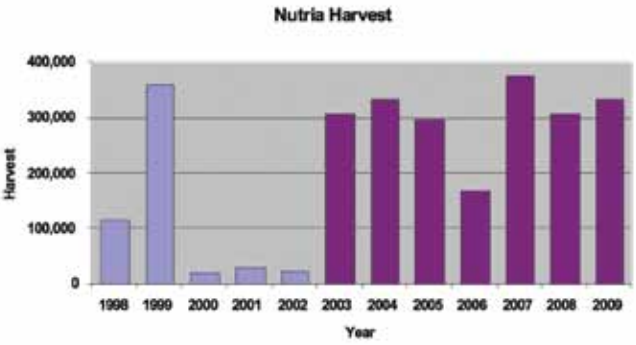
LDWF file photo

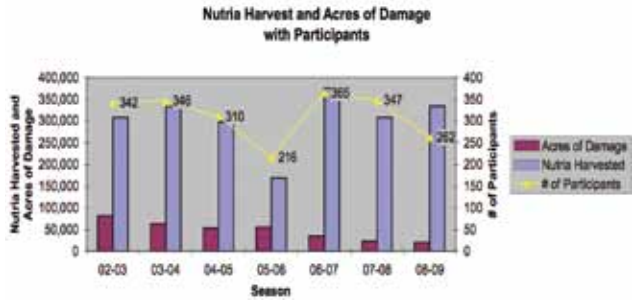


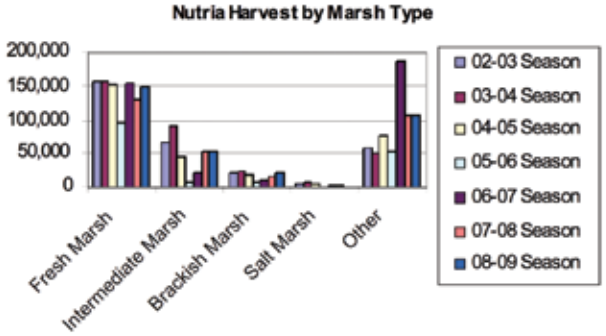



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# HABITAT IS THE POINT

*Wet pine savannahs provide excellent habitat for grassland species of wildlife such as Bachman's, Henslow's and LeConte's sparrows. Savannah meadow-beauty (Rhexia alifanus) is the prominent pink flowering plant.*

*Hardwood forests along drains provide added diversity for wildlife within pine flatwoods.*

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