LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES

2021-2022 ANNUAL REPORT

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The charge of the Louisiana Department of Wildlife and Fisheries is to protect, conserve and replenish the natural resources, wildlife and aquatic life of the state.

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COVER PHOTO: This photo was taken during vegetation surveys on a 1,000-acre coastal prairie remnant near Vinton, LA. Photo by Brian Early, LDWF

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LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES

ORGANIZATIONAL OVERVIEW

OFFICE OF SECRETARY

The Office of Secretary is administered by LDWF's chief administrative officer, who oversees all scientific operations as organized by the Office of Wildlife and the Office of Fisheries. The Secretary also has ultimate authority over the operation of LDWF's fiscal and business matters as administered by the Office of Management and Finance. Support operations of LDWF report directly to the Secretary. These include the Enforcement Division, LDWF's Legal Section, Internal Audit Section and Public Information.

ENFORCEMENT DIVISION

The Law Enforcement Division is responsible for enforcing laws enacted by the Louisiana Legislature, rules and regulations adopted by the Louisiana Wildlife and Fisheries Commission, and federal laws relative to fish and wildlife resources, boating safety, waterways enforcement activities, search and rescue, and homeland security missions.

LEGAL SECTION

The Legal Section represents the department and the Wildlife and Fisheries Commission in all legal matters involving promulgation, enforcement and administration of the state's fish and game laws and regulations, litigation involving department programs, daily advising and counsel, and drafting of contracts, legal documents and legislation.

INTERNAL AUDIT SECTION

The Internal Audit Section provides independent, objective assurance and consulting services designed to add value and improve the departments' operations. Internal Audit assists the department in accomplishing its' objectives by bringing a systematic, disciplined approach to safeguard and protect the department's resources and assets.

PUBLIC INFORMATION

The Public information section is responsible for media relations, all print publications (regulation brochures, "The Louisiana Conservationist" magazine, annual report, etc.), the agency website, social media, video production, photography, press conference organization, as well as speech writing and talking points as needed.

OFFICE OF MANAGEMENT & FINANCE

The Office of Management and Finance is directed by the Undersecretary. This unit is responsible for the following functions: human resources, accounting, budget forecasting and control, strategic and operational planning, property control and fleet management, boat registration, motor and boat titling, federal grant reporting, license and permit administration and issuing, fees, taxes and penalties collections.

LICENSING

The Licensing Section administers the issuance of all licenses, harvest tags and most other permits, boat and motor titles and registrations, and is responsible for the collection and deposit of related fees.

PROPERTY CONTROL

The Property Control Section is responsible for LDWF's movable property program, fleet management program, and managing property, marine, general liability, aviation and vehicle insurance claims.

FISCAL

The Fiscal Section is responsible for all financial operations of LDWF.

HUMAN RESOURCES

The Human Resources section handles all matters of employee relations, processes all employee personnel actions, processes all retirement/benefits related actions, develops related policies and procedures, coordinates all training activities for the agency, conducts new employee orientation, administers the performance planning and review program, handles all FMLA related matters and manages the safety program which includes worker's compensation processing.

OFFICE OF WILDLIFE

The Office of Wildlife consists of the Wildlife Division and the Restoration Program.

WILDLIFE DIVISION

The Wildlife Division is responsible for the state's wildlife conservation program, gathering biological data to properly manage wildlife resources, and conservation of coastal wildlife species and their associated habitats, along with statewide responsibility for nongame and threatened and endangered species, mandatory hunter education and training, minerals management, and wetlands conservation through regulatory programs. This is addressed through major programs: Wildlife Research; Land Development and Management; Rockefeller Wildlife Refuge; White Lake Wetlands Conservation Area; Wildlife Diversity; Alligator and Furbearer; Hunter Education; Minerals Management; and Habitat Section.

RESTORATION PROGRAM

The Restoration Program is responsible for informing and implementing habitat and species restoration projects throughout coastal Louisiana for the benefit of wildlife and fisheries. This program is also responsible for statewide response to oil spills and documenting their impacts to natural resources.

OFFICE OF FISHERIES

The purpose of the Fisheries program is to manage aquatic resources and their habitat, to support the fishing industry, and to provide access, opportunity and understanding of the Louisiana aquatic resources to the state's citizens and others beneficiaries of these sustainable resources. The Office of Fisheries is comprised of two Divisions: Fisheries Management and Fisheries Research and Development. The Fisheries Management Division includes the Marine Fisheries and Inland Fisheries Sections and the Oyster Lease Program. The Fisheries Research and Development Division includes Fisheries Extension, Fisheries Habitat, Fisheries Research and Assessment, and Socioeconomic Research sections.

MARINE FISHERIES

The Marine Fisheries Section is responsible for the monitoring and management of the state's estuarine and nearshore marine fishery resources. This includes both fishery-dependent (recreational and commercial) and fishery-independent monitoring of fish and shellfish populations. Section personnel annually develop recommendations for seasons, harvest limits, and other management measures to ensure sustainable populations.

INLAND FISHERIES

The Inland Fisheries Section is responsible for the monitoring and management of the state's freshwater resources. This includes sportfish population monitoring and management, providing boating access through aquatic vegetation control, as well as sportfish production and stocking through the hatchery system.

OYSTER LEASE PROGRAM

The Oyster Lease Section is responsible for the administration of oyster lease agreements and alternative oyster culture permits, in addition to the collection of revenue generated by these processes. This is done through a Geographic Information System (GIS) that the section manages and maintains.

FISHERIES EXTENSION

Fisheries Extension provides guidance and assistance to Louisiana's valuable commercial and recreational fishing sectors through assistance, education and outreach. The artificial reef program enhances the state's abundant marine resources by developing additional habitat utilizing clean, durable and stable materials.

FISHERIES RESEARCH & ASSESSMENT

The Fisheries Research and Assessment Section is responsible for conducting research on the state's estuarine, marine and inland fishery resources. The section includes the Fisheries Development Group and the Fisheries Research Laboratory on Grand Isle, which, in addition to research, also conducts monitoring of offshore fishery stocks through cooperative sampling programs. The section also includes the Fisheries Stock Assessment Program, responsible for developing modern measures of the health of fish stocks statewide to ensure sustainable populations and estimate effects of regulatory changes, and the Fisheries Habitat/Permitting Group which interacts with all LDWF sections and divisions and state and federal entities in planning and implementation of restoration initiatives for fulfillment of resource recovery agreements from oil spill settlements, reviewing and commenting on regulatory and consistency permit applications, and efforts to conserve and restore fish and wildlife habitat. In addition, the section conducts aquatic nuisance species monitoring and outreach.

A Word from the Secretary

One of the most rewarding parts of my job as Secretary of the Louisiana Department of Wildlife and Fisheries is observing our dedicated employees tackle the challenges we face daily.

Some days, we know exactly what to expect and how to go about solving those problems. Other times, the adversity comes without warning. But in either case, LDWF folks know how to react.

As you peruse this annual report, you'll see cases of both. And you'll get an idea of the scope of what we do each day. Most people see LDWF only from the periphery. I have the privilege of witnessing the great work of the LDWF staff.

Sometimes it makes headlines. But more often than not, we go about our business with little fanfare.

Our enforcement team is the most visible part of LDWF. You see our agents out administering the laws, rules and regulations in Louisiana's Sportsman's Paradise. They're busy.

In fiscal year 2021-22, enforcement conducted 119,096 patrol hours, including 72,638 on land and 23,685 on the water. Agents made 280,422 contacts with the public, most of whom were in compliance with the regulations. But they did issue 6,282 criminal citations and 4,232 warnings.

They also conducted many rescues during storms and other weather events. You may have heard about this one. LDWF Sgt. Stephen Rhodes, with help from good Samaritans, successfully rescued nine people after their boat capsized off Grand Isle.

With help from those folks, Sgt. Rhodes made his way to the capsized vessel that had eight people on top of the hull. A 7-year-old girl, however, was still in the water. Sgt. Rhodes was able to get the people from the capsized vessel onto his patrol vessel.

Sgt. Rhodes dove into the water and located the young girl under the capsized vessel. She was unresponsive but Sgt. Rhodes revived her by performing CPR. Sgt. Rhodes then transported those from the capsized vessel to a local marina where emergency responders were waiting. The EMS crew stabilized the young girl and airlifted her to Children's Hospital in New Orleans for recovery.

Enforcement also made many rescues during and after the devastating strike of Hurricane Ida in August of 2021. We were able to highlight Sgt. Rhodes heroic act, other enforcement actions and what we do as department through our public information staff.

Facebook remains our strongest social channel and thousands of questions are submitted annually through the messaging function, providing constituents another means of communicating with LDWF.

We communicate to the public through our website, which was redesigned two years ago. It is more user-friendly, easier to navigate, catalogs our publications and research in an easy to use format. The new website debuted Feb. 18, 2020. Between July 1, 2021 and June 30, 2022 we had 2.2 million users to the site, 3.7 million sessions and 7.5 million page views, an increase of 115% over the same period the prior year.

Our licensing section is busy with the public as well. We interact with more than 1 million customers who operate businesses, fish commercially, fish and hunt and use state lands for non-consumptive purposes, such as birding, hiking or photography.

During the fiscal year, we issued more than 1.5 million recreational hunting, fishing, trapping and non-consumptive use licenses and permits sold to more than 800,000 customers. That generated more than $27 million in revenue. The licensing section also maintained records for more than 100,000 lifetime licenses. It sold 47,600 commercial licenses representing about 8,600 commercial fishermen, 3,000 business entities, 1,000 charter businesses and other permits that generated more than $5 in revenue.

Another example of us meeting adversity head on came in our wildlife section with our deer program. Unfortunately, chronic wasting disease was found in Louisiana as we became the 29th state to detect the always fatal disease. The result from the positive 8.5 year old Tensas Parish buck was reported on Jan. 28, 2022.

LDWF and our deer program immediately implemented our Chronic Wasting Disease Response Plan. Mitigation measures include the prohibition of bait and deer carcass export restrictions. These measures were implemented for the Chronic Wasting Disease Control Area, which consists of the immediate area of the detection as well as a buffer area around the known positive case.

LDWF collected 1,602 chronic wasting disease samples in 2021-22 and 13,551 since 2002. The bulk of samples

are collected directly from hunters, but LDWF secured additional samples from deer hit by vehicles, taxidermists, processors and target deer which include symptomatic deer.

Hunters wishing to have their harvested deer tested for chronic wasting disease are encouraged to visit the LDWF website at *www.wlf. la.gov/page/cwd-testing* and follow the steps outlined, or call the nearest LDWF Field Office for assistance.

Deer hunting remains the most popular hunting sport in our state. During the statewide 2021-2022 deer season, 208,200 deer hunters harvested an estimated 233,400 white-tailed deer. The estimated harvest exceeded the previous 10-year high by more than 20%.

The 2022 turkey season was a success as an estimated 24,200 turkey hunters harvested approximately 9,100 wild turkeys during the spring of 2022. Both the estimated turkey hunter numbers and the estimated turkey harvest increased significantly from that of 2021. Estimated hunters increased approximately 23.5% while harvest increased approximately 65.5%.

Our whooping crane introduction program continues to make great progress. Eight chicks fledged from the 2022 spring nesting season, a record high for Louisiana and the number of fledged chicks for any previous or current reintroduction project.

In the Gulf of Mexico, 78% of the seafood production comes from Louisiana shrimpers, crabbers, oyster harvesters and fishermen. A total of 9,091 commercial fishermen and 4,711 seafood dealers/processors and brokers register each year to provide the nation with fresh seafood. There were 185,376 commercial fishing trips reported in 2021-2022 producing in excess of 865 million pounds of seafood.

Shrimp are the state's most valuable fishery. In 2021-2022, total shrimp landings measured over 83.1 million pounds and had a dockside value of approximately $119.4 million.

Louisiana commercial blue crab landings for 2021-2022 totaled approximately 51 million pounds and had a dockside value of nearly $77.2 million.

Louisiana commercial freshwater finfish landings for 2021-2022 totaled approximately 12.5 million pounds and included common species such as alligator gar, blue catfish, channel catfish, flathead catfish, freshwater drum, buffalo, bowfin, carp and gizzard shad. Total dockside value of these species was approximately $5.7 million.

Since 2004, Louisiana has been the leading oyster producing state, with the exception of the year of 2020. During that time, Louisiana accounted for 48% of all eastern oyster landings in the country. Total 2020 landings were the lowest ever recorded, a reflection of the unprecedented 2019 floods that affected the oyster reefs across the state. However, 2021 combined landings showed recovery landing about 6.6 million pounds of meat, as Louisiana was once again the number one producer of eastern oysters in the country.

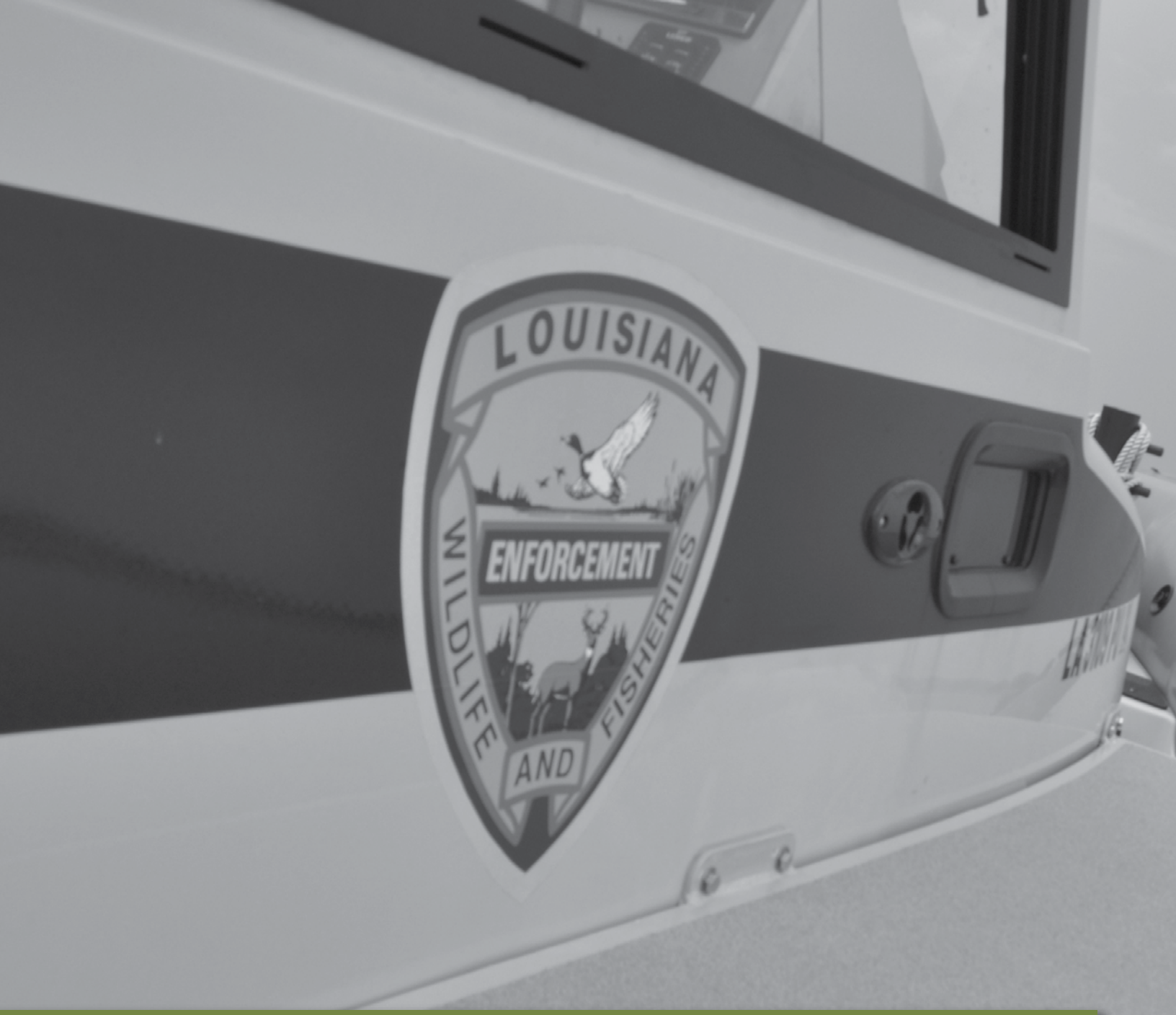
Keeping a close eye on the state's resources is certainly one of our top priorities. Our LA Creel program has been a key asset in doing that. Through the LA Creel program, 11,269 recreational fishing trips, comprised of 29,898 individual anglers, were surveyed dockside during fiscal year 2021-2022. Sixty-three different interviewers completed 1,545 (94%) of the 1,643 assignments as drawn during the sample period.

During 2021-2022, 285,216 contacts were made with Louisiana recreational saltwater fishing license holders for the purposes of collecting private saltwater fishing effort. After expansion, the estimated number of private saltwater fishing trips taken during the period was 1,635,573.

Our fish hatcheries were busy in 2021-22. We released approximately 12.9 million fish into public Louisiana waterbodies during the period. The released fish were comprised of 11 species and included various surplus hatchery fish as well as fish purchased by other state/local organizations through cooperative agreements. Ranging in size from fry to adults, the fish were planted into 67 public waterbodies for the purposes of rough fish control, sportfish enhancement, aquatic plant control or to provide improved fishing opportunities.

This only skims the surface of the hard work that our staff performs each day. I hope you'll read further in this report and gain a better understanding of what we do to enhance our state's wildlife and fisheries resources.

Jack Montoucet, *LDWF Secretary*



Office of Secretary

ENFORCEMENT DIVISION

The Louisiana Department of Wildlife and Fisheries Law Enforcement Division (LDWF-LED) is responsible for enforcing laws enacted by the Louisiana Legislature and federal laws relative to fish and wildlife resources, boating safety, waterways enforcement activities, search and rescue, and homeland security missions.

LDWF-LED is a fully-commissioned statewide law enforcement agency with the primary mission of protecting Louisiana's natural resources and serving the people who utilize them. Beyond the traditional role of ensuring compliance with licensing and harvesting regulations, LDWF-LED also conducts search and rescue missions, enforces boating safety laws, investigates boating crash incidents and hunting accidents, and provides boater education classes for thousands of citizens each year.

The Law Enforcement Division is responsible for enforcing laws as provided for in the:

- Constitution of the State of Louisiana
- Louisiana Revised Statutes
- U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA)/LDWF Law Enforcement - Cooperative Enforcement Agreement - Law Enforcement Services under:
  - Magnuson-Stevens Fishery Conservation and Management Act
  - Endangered Species Act of 1973
  - Marine Mammal Protection Act of 1972
  - Lacey Act
- U.S. Department of Interior, U.S. Fish and Wildlife Service (USFWS)/LDWF Law Enforcement - Memorandum of Agreement - Law Enforcement:
  - Migratory Bird Treaty Act
  - Lacey Act; Migratory Bird Hunting and Conservation Stamp Act
  - Bald and Golden Eagle Protection Act
  - Airborne Hunting Act
  - National Wildlife Refuge System Administrative Act
  - Endangered Species Act
  - Marine Mammal Protection Act
  - Archeological Resources Protection Act
  - African Elephant Conservation Act
  - Antarctic Conservation Act
  - Wild Bird Conservation Act and Recreation Act
- U.S. Coast Guard/LDWF Law Enforcement - Statement of Understanding - Boating Safety Regulations:
  - BWI
  - Public Education and Training
  - Boating Accident Investigations
  - Search and Rescue
  - Regattas and Marine Parades
- Louisiana Department of Health/LDWF Law Enforcement
  - Memorandum of Understanding - Louisiana Shellfish Sanitation Program
  - National Shellfish Sanitation Program

LDWF-LED conducted 119,096 patrol hours in FY 2021-2022: 72,638 on land and 23,685 on water. Agents made 280,422 contacts with the public, the majority of whom were in compliance with state and federal wildlife and fisheries regulations. LDWF-LED agents issued 6,282 criminal citations and 4,232 warnings during this period. The most common types of citations were fishing without a license, failure to comply with personal flotation device requirements, not abiding by rules and regulations on wildlife management areas (WMAs), and failure to comply with deer tagging or harvest record regulations.

ORGANIZATIONAL STRUCTURE & PERSONNEL

LDWF-LED is organized in a paramilitary structure to assure the efficient use of resources, consistent statewide enforcement policy, and an effective, coordinated response to urgent needs. LDWF-LED is commanded by one colonel, the Chief of Enforcement, who reports directly to LDWF's Secretary and oversees administration of the division. Reporting to the colonel are two Lieutenant Colonels. One Lieutenant Colonel serves as assistant chief of administration while the other Lieutenant Colonel serves as assistant chief of patrol. The administration side includes budget, communications, emergen-

FIGURE 1. *LDWF Law Enforcement Division Organization Chart during FY 2021-2022*

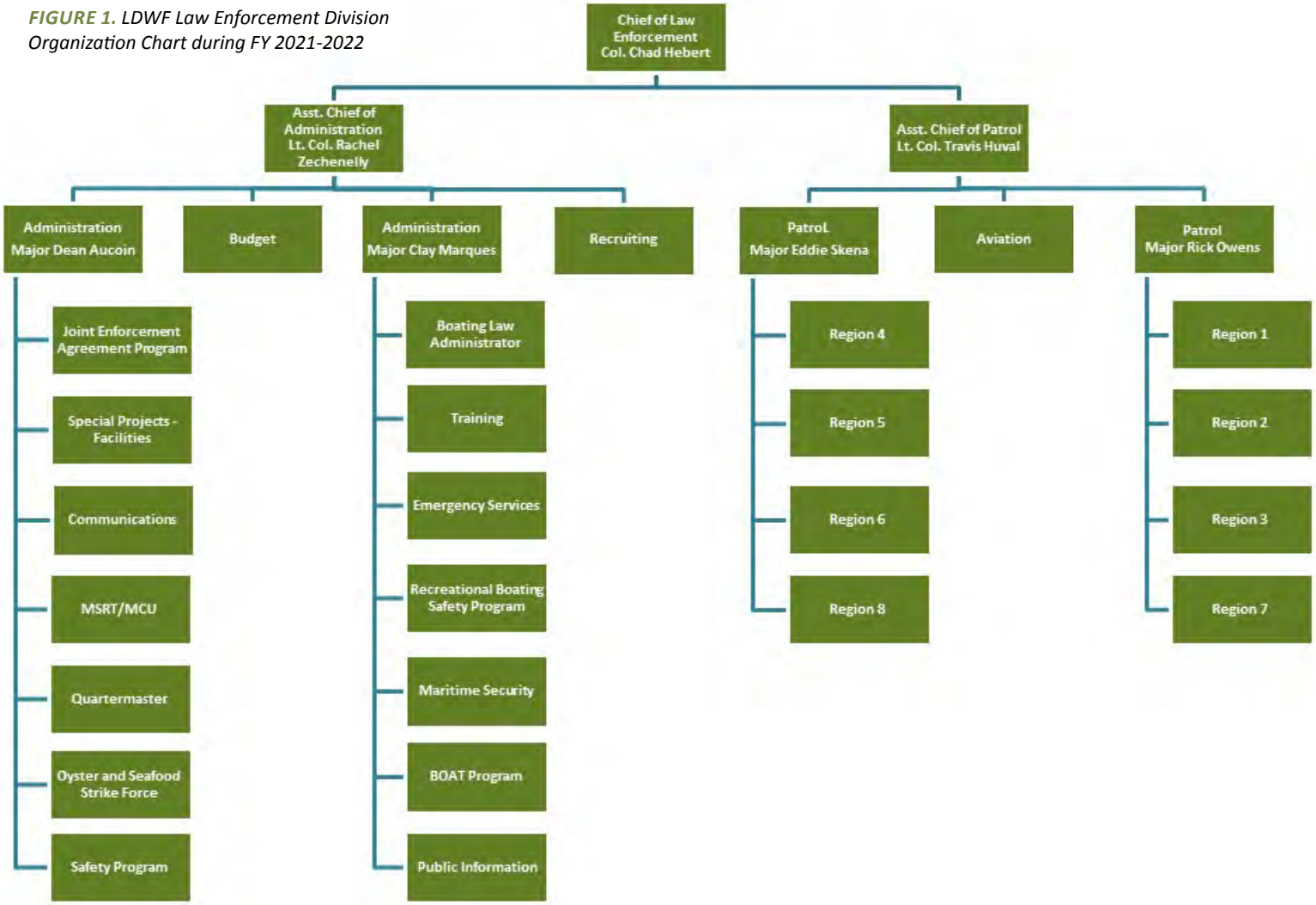


FIGURE 2. *Enforcement Division Regions*

cy services, recreational boating safety and education, training, support, and public information. The patrol side includes all state regional field operations and the aviation section.

There are four majors:

- One over the Joint Enforcement Agreement Program, special projects-facilities, communications, Maritime Special Response Team, quartermaster, Oyster and Seafood Strike Force, and safety program.
- One over safe boating program, training, emergency services, maritime security, public information, and National Association of State Boating Law Administrators (NASBLA) Boat Operations and Training Program.
- One over Regions 4, 5, 6 and 8.
- One over Regions 1, 2, 3 and 7.

The LDWF Enforcement Division is currently headed by Col. Chad Hebert, a 28-year veteran at LDWF. Hebert was promoted to the rank of Colonel in July 2020 and replaces Col. Sammy Martin, who announced his retirement in June 2020 after 38 years.

Col. Chad Hebert

Hebert, from Schriever, has earned numerous awards during his LDWF career. He has twice been honored with the LDWF Meritorious Service Award (2006, 2017), named Statewide LDWF Agent of the Year (2001), Region 9 Agent of the Year (2001) and Outstanding Officer (2001). Named Lt. Colonel in 2018, Hebert helped direct statewide operations and patrols as well as the administrative functions of the Enforcement Division. He also worked with other federal and state enforcement agencies, including USFWS, the Drug Enforcement Agency, Homeland Security, the Louisiana State Police and state attorney generals and judges.

Col. Hebert served as major from February 2017 until his promotion and represented the LDWF Enforcement Division on the Crab Task Force, Oyster Task Force, Shrimp Task Force and Finfish Task force. He also served as an enforcement captain from 2013-2017, an enforcement lieutenant from 2009-2013, an enforcement sergeant from 2005-2009 and an enforcement senior agent from 1994-2005. As a senior agent, in addition to his other honors, he received the Certificate of Valor from the North American Wildlife Officer's Association in 2002. He completed the LDWF Cadet Academy in 1993, earning the high overall achievement award, the high marksmanship award and physical fitness award during the training academy.

The Enforcement Division is divided into eight enforcement regions. Each numbered enforcement region is composed of two or three multi-parish districts. Each region is managed by a captain who supervises two or three district supervisors of the lieutenant rank. Regions have between 16-25 agents, depending on regional size, resident population and participant population. Current funding provides a field enforcement staff of two to four agents per parish, according to the nature of wildlife-based activities in the area, the number of people participating, the frequency of their participation and other factors.

Total division head count is 257 positions including 234 enforcement agents, 13 administrative staff, eight communications officers and two pilots. The actual number of filled positions (as of July 2022) is 223.

REGIONAL ENFORCEMENT PROGRAMS

Most of the law enforcement activity performed by LDWF-LED is conducted by regional agents. Regional agents work a schedule assigned by their supervisors to address seasonal needs, reported violations, weather conditions and predominant activities. Agents are on-call 24 hours per day and must be willing to change their work hours and locations as circumstances require. Schedules are often changed due to weather and reported violations, and agents are often called out to respond to violations in progress, boating and hunting accidents, and calls for search and rescue.

Agents use a variety of vehicles during land patrols, primarily four-wheel drive trucks and all-terrain vehicles. The primary patrol vessels used during water patrols are outboard bay boats and 19-to-40-foot marine patrol vessels. LDWF-LED also deploys go-devils, airboats, surface river mudboats, bass boats and flatboats.

SPECIALIZED UNITS

The LDWF Enforcement Division contains three specialized units with selected missions or purposes: the Maritime Special Response Team; the Aviation Section; and the Oyster Seafood Strike Force. Agents in specialized units have developed specific skills, expertise and knowledge appropriate for their particular operational fields. Agents in specialized units operate in relatively broad geographic areas and may work alongside regional enforcement agents when appropriate.

MARITIME SPECIAL RESPONSE TEAM

The Maritime Special Response Team cooperative endeavor by LDWF-LED and the Louisiana State Police SWAT team addresses maritime security threats within the state of Louisiana. The team provides a maritime tactical response capability at the state level in order to effectively provide public safety, officer safety, Chemical, Biological, Radiological, Nuclear and High-yield Explosives prevention, and response and tactical support for LDWF's federal, state and local partners.

AVIATION SECTION

The Aviation Section contains two pilots and three total planes which include one Kodiak and two Cessna 206 amphibians. The Aviation Section's aircraft provide a valuable platform for detecting illegal hunting and fishing activities and frequently play a vital life-saving role in search and rescue operations. The Aviation Section also contributes its services to other divisions for biological missions, such as waterfowl counts and the monitoring of commercial fisheries.

OYSTER SEAFOOD STRIKE FORCE

The Oyster Seafood Strike Force is assigned to work problem areas on the coast. They devote attention to commercial fisheries with a focus mainly on oysters, license fraud and white collar crimes. Violations include smuggling, interstate commerce violations and false reporting, and underreporting of commercial fish harvests. Violations pertaining to oysters include harvesting polluted oysters, theft of oysters, illegal tagging, oyster size regulations, and sanitary code violations. The agents are licensed FAA drone pilots. The unit has three drones assigned, which are capable of night or day surveillance. Oyster Seafood Strike Force agents also work with regional agents on coastal patrols.

BOATING SAFETY PROGRAM

With 15,000 miles of tidal coastline, 5,000 miles of navigable waterways, three of the busiest ports in the country, a thriving shipping industry, a large commercial fishing fleet, and over 317,000 registered boats, Louisiana contains many geographic, demographic and economic features that pose special challenges for boating safety enforcement.

LDWF-LED agents made 77,501 public contacts during the course of 25,386 patrol hours dedicated to boating enforcement, education and accident investigation in FY 2021-2022. Of those hours, 16,913 patrol hours were performed in vessels on the water.

The adoption of “Rules of the Road” regulations for boaters has enhanced the enforcement of boating safety regulations and boating under the influence laws. These regulations provide the boating public with clear rules for the manner in which boats are operated and are an important tool in determining fault in boating accidents. The “Rules of the Road” also enhance the ability of agents to address reckless and careless operation of motorboats. In FY 2021-2022, LDWF-LED agents issued 57 citations for careless and reckless operation of a vessel and 89 citations for operating a vessel while intoxicated.

The statewide LDWF-LED boater education course teaches safe, legal and responsible boat operation and is approved by NASBLA. This program provides a vital outreach to the community and has greatly improved the awareness of and compliance with boating safety practices and regulations in Louisiana.

Agents hold monthly classes in each region for anyone who wishes or is required by Louisiana law to take them. In FY 2021-2022, 4,749 citizens were certified in classroom and online classes. LDWF-LED continues to recruit and train additional volunteer instructors to complement and enhance the efforts of its own agents. Since the inception of the boating safety education course in 2003, LDWF has certified 144,848 students.

LDWF-LED remained committed in marketing and promotion of boating education courses by creating special events and activities for students attending courses.

LDWF participated in the National Association of Boating Law Administrators (NASBLA) Operation Dry Water Weekend from July 2-4 in 2021. During the Operation Dry Water weekend, LDWF agents were out in force patrolling state waterways for impaired boat operators. During the weekend, LDWF agents cited 11 people for DUI while operating a vessel.

LDWF participated in several national campaigns including “Wear your PFD to work Day” on May 20 and the “Safe Boating Week” in Louisiana from May 21-27. LDWF-LED agents were out in full force as always during the safe boating week to perform boating safety checks and driving or operating a vessel while intoxicated (DWI) patrols.

LDWF-LED held their annual "Boating Education Lagniappe Day" on April 23, 2022. This was the 11th annual Lagniappe Day. LDWF certified 72 boaters at boating safety classes in eight different locations across the state and provided food and drinks, giveaways and door prizes.

Media interviews, news release articles, public relation events and social media comments occurred throughout the state during all listed campaigns.

SEARCH & RESCUE OPERATIONS

LDWF-LED is responsible for providing and coordinating search and rescue response and maritime security activities for the state. This activity supports the state’s goal of hurricane recovery and emergency preparedness by planning, training and coordinating local, state and federal response for search and rescue associated with natural or man-made disasters. Preparedness and efficient execution of search and rescue response events is essential to saving lives and swift recovery efforts. Providing maritime security on our state’s waterways is essential to protection of critical infrastructure located in maritime environments throughout Louisiana.

An LDWF enforcement agent with the help of some good Samaritans successfully rescued nine people after their boat capsized in Jefferson Parish on May 7. LDWF Sgt. Stephen Rhodes was on patrol on the beach of Grand Isle with his patrol vessel in tow around 6:40 p.m. He observed a vessel trying to exit the rock jetties and start to take on water before capsizing. Sgt. Rhodes was picked up by some good Samaritans in an ATV to transport him to his truck to launch his vessel. The same good Samaritans helped him launch his vessel. Sgt. Rhodes made his way to the capsized vessel that had eight people on top of the hull. Those people notified Sgt. Rhodes about a missing 7-year-old girl still in the water. Sgt. Rhodes was able to get the people from the capsized vessel onto his patrol vessel. He then flagged down another boat to help hold his vessel in place so he could jump in the water to look for the young girl. Sgt. Rhodes jumped in the water and located the young girl under the capsized vessel. He got her onto his vessel and she was unresponsive. Sgt. Rhodes then started CPR on the young girl and was able to revive her and get her breathing. Sgt. Rhodes then transported the people from the capsized vessel to the Bridgeside Marina where EMS was waiting. The EMS crew stabilized the young girl and she was airlifted to Children’s Hospital in New Orleans where she is expected to make a full recovery.

LDWF enforcement agents and Vermilion Parish Sheriff's Office deputies rescued three boys from Vermilion Bay this morning, Nov. 26. LDWF agents were alerted around 6 a.m. about a capsized vessel in Vermilion Bay with two 17-year-old boys and an 18-year-old clinging to the vessel. LDWF agents along with Vermilion Parish Sheriff's Office deputies arrived on scene around 6:45 a.m. and were able to get the boys into the LDWF vessel. The agents and deputies then transported the boys to shore where they were checked out by emergency medical services personnel and released to their families. Agents learned that the boys launched their 14 to 16 foot vessel in Vermilion Bay to go duck hunting around 5 a.m. The water was too rough so they tried to turn around to go back when the motor stalled. The boat then took on water and capsized. One of the boys had his cell phone in a waterproof case and they were able to call the Vermilion Parish Sheriff's Office for help.

LDWF-LED agents rescued two men in Sabine Parish on Feb. 12. Agents received a call around 12:45 p.m. that a vessel flooded with two men on board and was not able to return to shore on Toledo Bend. Agents learned that the two men were fishing in a tournament when the weather turned bad and waves overtook their vessel. Agents responded to the scene immediately and found the men around 1:30 p.m. about a quarter of a mile from Solan's Landing on Toledo Bends. The vessel was flooded and grounded in shallow water. Agents loaded the men into their enforcement vessel and transported them back to shore where an ambulance was on standby. One of the men was treated for hypothermia at the Desoto Parish Medical Center and released the same day.

LDWF enforcement agents are investigating a fatal boating incident that occurred in Sabine Parish on March 4. The body of Alfred D. Jackson, 52, of Lake Charles, was recovered from Toledo Bend around 6 p.m. on March 4. Search and rescue crews from LDWF, Sabine Parish Sheriff's Office and Texas Parks and Wildlife received a call around 3 p.m. on March 4 about two men that were in the water after their vessel sank. The crews immediately began searching the area. Texas Parks and Wildlife personnel found the men in the water around 6 p.m. with one of them still alive. The survivor was brought to the shore and airlifted to a Shreveport Hospital for severe hypothermia. Jackson's body was turned over to the Sabine Parish Coroner's Office to determine an official cause of death. LDWF will be the lead investigative agency for this fatal boating incident. The men were in a 20 foot vessel when high winds caused high waves that swamped their boat causing it to sink. Both men were found wearing personal flotation devices.

LDWF-LED took part in a successful search and rescue mission for three stranded boaters in Sabine Parish on March 26. Agents received information around 11 p.m. that three boaters were stranded on Toledo Bend after their boat was swamped and ran aground. Agents along with a Sabine Parish Sheriff's Office deputy responded to the scene immediately and found the three boaters clinging to a side of a cliff near the water with their personal flotation devices on. The agents were able to load them in their vessel and transport them to the bank where they were checked out by medical personnel and released. Agents learned that the boaters left out of Kite's boat launch near Florien around 9 p.m. in an 18-foot vessel. They were fishing for about an hour in a half when large waves started to come over the gunwale and eventually flooded the vessel causing the vessel to run aground and then sink. The boaters were able to make a call for help before swimming to the shore and clinging to the cliff to await for help. Agents were able to retrieve the sunken vessel on March 27. Agents believe that high winds and waves as the contributing factors for this boating incident.

LDWF enforcement agents rescued a deck hand from the Mississippi River in East Carroll Parish early this morning, April 8. Agents received a call around 1 a.m. about a 33-year-old deck hand who fell off a tugboat and into the Mississippi River near the Lake Providence port. Agents responded to the scene immediately and rescued the deck hand on the banks of the river around 2 a.m. According to the deck hand, he fell off the tugboat while wearing a personal flotation device and holding a hand held radio. The deck hand was able swim to the bank on the Louisiana side of the river and notify the tugboat operator. The tugboat operator then notified officials. Agents brought the deck hand to the Lake Providence Hospital where he was treated for hypothermia and released.

HURRICANE IDA (Aug. 30, 2021)

226 people and 15 pets rescued

LDWF deployed 30 agents with trucks and vessels to Laplace and 20 agents with trucks and vessels to Lafitte in the aftermath of Hurricane Ida. Agents rescued 219 people and 15 pets from the Laplace area and six people from the Lafitte area after high water inundated those areas in the storm's aftermath. Agents were able to make many rescues with their traditional shallow draft vessels and trucks, but they also deployed two Hydratek amphibious track vehicles to make a bulk of the rescues.

AGENT TRAINING PROGRAM

ACADEMY

The LDWF Enforcement Division conducted the hiring process to fill 31 enforcement agent positions in the early part of 2022. The LDWF Training Academy Class 34 began their six months of training on Jan. 4, 2022.

On June 29, 2022, LDWF graduated its 34th class of cadets into the ranks of LDWF Enforcement Division agents at a ceremony in Baton Rouge. After six months of training at the academy, 17 newly commissioned agents are ready to begin enforcing hunting, fishing and boating regulations that govern the use of the state's natural resources.

Completed construction on the new Natatorium at the Waddill Training Complex in Baton Rouge. The Natatorium includes a swimming pool, full gym and locker rooms to be used for training and other activities.

LDWF certified one lifeguard in 2021-22 bringing their total to 11 certified lifeguards. Lifeguarding with CPR with AED for professional rescuers. First Aid and administering emergency oxygen. American Red Cross Certification.

LDWF has 10 NASBLA Officer Water Survival Credentialed Instructors.

LDWF sent two agents to Florida whom successfully passed and became Field Training Officer program managers.

Completed and enhanced the vehicle operator course. LDWF has delivered 13 out of 20 scheduled courses with nine instructors that are certified in enhanced driving instructor course by the Louisiana State Police.

LDWF has five additional DT instructors for a total of 15 Agents that have taken the Monadnock DT course.

LDWF has four new road SFST instructors and have 12 agents whom are now NASBLA credentialed instructors for the BUI seated SFST course.

LDWF sent one agent to Georgia whom is now a certified ATV Safety Institute Instructor.

LDWF currently has 18 agents whom are licensed through the FAA as remote pilots for our unmanned aircraft system program.

LDWF increased our Agents Crisis Team with six additional members whom successfully passed a critical incident stress management course in Baton Rouge.

LDWF hosted a FLETC TAC-MED course and certified 10 instructors. Louisiana hosted the course as law enforcement personnel from Texas, Mississippi and Arkansas attended the course.

LDWF had eight agents attend and successfully pass a Boating Incident Investigation and Reconstruction (BII-Level 2 advanced) course in Florida.

LDWF sent two agents to Texas whom became certified in NASBLA's Airboat Operator Course.

LDWF sent one agent to Texas whom became certified in NASBLA's Waterborne Armed Threat Emergency Response.

LDWF sent 11 agents to become certified as instructors by the National Safety Council in First Aid, CPR and AED.

LDWF sent four agents to become certified by the U.S. Coast Guard Marine Law Enforcement Academy in Federal Fish Law, Fish ID, Case Package Preparation, Mock Boarding's and Gear Examinations.

LDWF has sent five agents to the FLETC Use of Force Course and have successfully became instructors.

LDWF sent two agents to Texas whom have successfully passed the U.S. Coast Guard Search and Rescue Coordination and Execution Course.

LDWF had 21 agents participate in a Louisiana State Police electronic evidence familiarization course.

LDWF certified 23 agents to become WebEOC Operators to help with request and logistics for any upcoming ESF-9 events.

IN SERVICE TRAINING PROGRAM

The LDWF-LED in-service training program is conducted in three phases and consists of "annual in-service," "spring firearms" and "fall firearms." The in-service training is necessary in order to meet federal and state training requirements and to advance individual officer capability.

Annual in-service is usually around 40 hours and consists of 10 training sessions conducted over a 10-month period. During these sessions, agents receive training in firearms, defensive tactics/use of force, officer survival, legal, first aid and electives. Spring and fall firearms training sessions focus on firearms qualification and training.

At the end of 2021, agents completed their annual and fall/spring firearms in-service training requirements, which consisted of the following:

SPRING/FALL: IN-SERVICE

- Firearms - Rifles, Shotguns and Pistols

ANNUAL: IN-SERVICE

- First Aid/Blood Borne Pathogens/CPR for the Professional Rescuer
- MDTS (Monadnock Defensive Tactics Systems) Defensive Tactics/DT Scenarios
- MEB (Monadnock Expandable Baton) Retrainer
- Officer Survival w/simunitions/Use of Force with scenarios
- HIATT Tactical Handcuffing
- DWI Intox. 9000
- Standardized Field Sobriety Testing

DWI

One agent was certified as Drug Recognition Experts (DRE), bringing the LDWF-LED total to 20 DREs.

MARINE LAW ENFORCEMENT TRAINING PROGRAM

At the end of 2021, all agents had completed their annual recertification as Boat Operators for Search and Rescue in NASBLA, Boat Operations and Training Program (BOAT). Additionally, we certified three agents as NASBLA Instructors for Boat Crew Member and Boat Operators for Search and Rescue.

CRISIS INTERVENTION OR CRITICAL INCIDENT TRAINING

LDWF trained six agents in Crisis Intervention and Critical Incident as part of the Agents Crisis Team. LDWF now has a total of 14 agents trained in Crisis Intervention. The Agents Crisis Team consists of agents who are specially trained as skilled listeners. The objective of the Agents Crisis Team is to provide support for law enforcement personnel,

and their immediate family, who have experienced a critical incident or traumatic event. A Critical Incident is defined as any incident, action, or event, which has the potential for producing significant emotional trauma that may adversely affect the psychological well-being of law enforcement personnel.

RECRUITING

LDWF created a recruiter position within the enforcement division. The recruiter position focuses on reaching more qualified candidates who have the motivation and interest in becoming an LDWF agent while also diversifying the workforce.

JOINT ENFORCEMENT AGREEMENT

LDWF-LED again entered into a Joint Enforcement Agreement with NOAA's Office for Enforcement. LDWF-LED received approximately $880,624 in FY 2021-2022 to patrol for compliance with federal commercial and recreational fisheries regulations, primarily in the Gulf of Mexico.

OPERATION GAME THIEF

Louisiana Operation Game Thief, Inc. is a program which provides cash rewards to those providing information leading to the apprehension of wildlife violators. Violations can be reported anonymously by calling a 24-hour toll-free telephone number (1-800-442-2511) or by using LDWF's tip411 program. To use the tip411 program, citizens can text LADWF and their tip to 847411 or download the "LADWF Tips" iPhone or Android apps from the Apple App Store and Google Play free of charge. The hotline and the tip411 program are monitored 24 hours a day by the LDWF Communications Center. Reports are immediately referred to agents for action.

During the 2021 year, Operation Game Thief paid out $10,100 in rewards. In 2021 the Louisiana Operation Game Thief board reviewed 28 cases that led to 52 subjects getting cited or arrested and a total of 203 citations issued. From 1984 till the end of 2021 the Louisiana Operation Game Thief board has paid out a total of $456,910 in reward money to informants.

HOMELAND SECURITY

LDWF-LED is an active participant in Louisiana's Homeland Security Plan and represents the state in waterborne emergencies. Through the Governor's Office of Homeland Security and Emergency Preparedness, LDWF-LED is the lead agency for search and rescue operations during natural disasters and maritime security of Louisiana's vital business and government interests along the coast and major rivers. As members of the Governor's Homeland Security Advisory Council and all major port security committees within the state, LDWF-LED agents frequently respond to requests to deploy LDWF marine resources for security concerns. LDWF-LED's specialized training and equipment and its ability to operate throughout the state's vast maze of waterways and wild areas has complemented Louisiana's ability to respond to emergencies on land and water.

Emergency Support Function annual support plan for maritime and port security has been updated. LDWF-LED serves as the primary port and maritime security support partner.

LDWF-LED is a member of the First Responder Committee through the Governor's Office of Homeland Security and Emergency Preparedness which was legislatively created. LDWF-LED's maritime security role coincides as a multi-mission responsibility and further enhances the agency's core mission responsibilities to improve public safety services and protect natural resources and the supporting ecosystem while improving security in the state and nation.

MARITIME SPECIAL RESPONSE TEAM

During this period the LDWF-LED Maritime Special Response Team completed their annual training which consisted of:

- Close Quarter Battle Techniques
- Firearms Training
- Security Zone Enforcement Procedures
- Underway Training
- Hostage scenarios
- Large Vessel Training
- Rural Operations and Tactical Tracking
- Water Survival

At the end of 2021, Maritime Special Response Team members had completed their annual recertification as Tactical Operators Course in the NASBLA BOAT Program.

PREVENTATIVE RADIOLOGICAL AND NUCLEAR DETECTION

LDWF continues to work with key local, state and federal partners to implement a Preventative Radiological and Nuclear Detection Program in the state of Louisiana. Through our partnership with the Domestic Nuclear Detection Office, the state has developed a Statewide Concept of Operations Plan, as well as standard operating procedures for individual agency partners. LDWF and Preventative Radiological and Nuclear Detection partners successfully completed a three-day training exercise as well as a full-scale exercise.

ACQUISITIONS

EQUIPMENT:

- 25 Point Blank Bullet Proof Vests
- 200 Bluebird "Gizmos"
- 200 Bluetooth Portable Printers
- Six Honda FourTrax Rancher 4x4 ATV's
- Four 17'x 50" Gator Tail Boat/40 HP XD-EFI Motor/Remote Steer/Trailer
- Six 40 HP Gator Tail Motor/Center Console
- Seven Suzuki 30 HP Motors
- Five Suzuki 150 HP Motors
- Two Suzuki 200 HP Motors
- Three Suzuki 250 HP Motors
- One Suzuki 300 HP Motor
- Two Suzuki 350 HP Motors
- Two GPSMAP Sidevu Boat Mounted Sonars with Radomes
- 12 Glock 17 Gen 5 Pistols
- Five Glock 43x Pistols
- Two Ford F250 4x4's
- One Ford Expedition XL
- 220 Dell Laptops
- 20 Dell Desktops
- 17 Dodge 1500 Pick-ups
- Four Dodge Durangos
- Lowrance HDS16 Sidescan Sonar

PUBLIC INFORMATION

The LDWF-LED Public Information section does various media and public information related tasks. The public information section handles public emails, Facebook questions, media requests including setting up interviews, and gathering enforcement related information. The public information section also provides footage and photos to media outlets both in-state and nationally.

LDWF-LED issued 129 enforcement related press releases during FY 2021-2022. These press releases were issued to a media contact list via email both state and nationwide. They were also posted on the LDWF website. The press releases ranged from rewards for information on current cases, conviction results, announcements of event and upcoming cadet academies, highlighting important and unusual cases, enforcement division and agent achievements and awards won, and boating safety information.

LDWF-LED public information also produces videos for both external and internal use. The videos range from public service announcements, cadet recruitment, hunting and boating safety and cadet training.

LDWF ENFORCEMENT NEWS

LDWF RELEASES RECRUITING VIDEO AND AUDIO CLIP FOR UPCOMING ACADEMY ANNOUNCEMENT

LDWF-LED has released recruiting video and audio files to help with recruiting for their next academy that will be announced in August.

The recruiting video and audio clips can be used for any TV or radio public service announcement spot that is available. The recruiting video can be found at *www.wlf.la.gov/page/become-an-agent*. For a direct download of the video and for the audio attachment, please email Adam Einck at aeinck@wlf.la.gov.

"We are trying to recruit the best possible candidates for our next cadet academy that will be announced soon," said Col. Chad Hebert, head of the Enforcement Division. "Anyone that is interested in working in the outdoors and is qualified should strongly consider a career as a Louisiana Wildlife Agent."

The LDWF Enforcement Division plans on announcing their 34th Cadet Academy sometime in August. Once the announcement is made, the application period will be open for 21 days on the Louisiana Civil Service website for the job title "Wildlife Enforcement Cadet."

AGENTS RESCUE WOMAN FROM OVERTURNED CAR IN CREEK IN UNION PARISH

LDWF enforcement agents successfully rescued a woman after a traffic accident in Union Parish this afternoon, July 19.

LDWF Corporal Clint Branton and Senior Agent Hunter Breed were traveling westbound around 1 p.m. on Evergreen Road west of Farmerville when they encountered a Honda Civic in the eastbound lane. The car crossed over the road into the agents' lane and then into a creek that runs alongside the road.

The car entered the creek and was upside down in the water with a 46-year-old woman trapped inside. Corporal Branton and Senior Agent Breed responded immediately and were able to free the woman from the car and get her to safe ground. The woman only suffered a small cut on her arm.

"This could have been a very different outcome if no one would have witnessed this traffic accident and been able to respond within seconds," said Col. Chad Hebert. "The agents were in the right place at the right time and their quick reaction saved this motorist's life."

SPECIAL EPISODE OF "LOUISIANA LAW" FEATURES LDWF ENFORCEMENT DIVISION EFFORTS FOR HURRICANE IDA

On Aug. 29, 2021, Hurricane Ida made landfall as a Category 4 hurricane, slamming Louisiana's coastline with 150 mile per hour winds and catastrophic storm surge. One of the strongest storms in Louisiana's history, Ida left a trail of devastation across the state and triggered a heroic response from emergency personnel, including the Wildlife Agents of LDWF. An all-new special episode of Animal Planet's Louisiana Law offers a stunning up-close look at the Wildlife Agents' missions during Hurricane Ida, from the hours leading up to landfall through the aftermath and recovery.

LOUISIANA LAW: IN THE EYE OF HURRICANE IDA premieres on Animal Planet Sunday Oct. 10 at 8 p.m. central and streams on discovery+, the definitive non-fiction, real-life subscription streaming service, the same day.

LOUISIANA LAW: IN THE EYE OF HURRICANE IDA features LDWF Agents conducting search and rescue missions through the floodwaters and wrecked homes. With communications and utilities down, Agents bring their unique skillsets and equipment to the aid of their fellow Louisianans. In the aftermath of the hurricane, agents go door to door on humanitarian missions getting critical supplies to those who need them the most.

"Louisiana experienced one of the most destructive hurricanes in the state's history and we felt a responsibility to bring these search and rescue stories to our audiences," said Amy Introcaso-Davis, Executive Vice President, Development and Production, Factual Programming, Discovery.

"What the public sees in this segment of Louisiana Law is the best example of how our agents immediately answer the call to help the great people of our state during times of disaster, while in some instances, those agents are leaving their own homes and families at risk," said LDWF Secretary Jack

Montoucet. “It is gratifying to see the resilience of the people our agents interacted with. They are the best examples of Louisianans who get stronger and battle back, both emotionally and physically, after catastrophes.”

Colonel Chad Hebert, head of the LDWF Enforcement Division said, “We are super proud of the job our agents did in the aftermath of Hurricane Ida. From search and rescue to humanitarian and security patrols, our agents stepped up and performed their duties to the best of their abilities. This Hurricane Ida special of Louisiana Law showcases the job our agents did and also the spirit of the Louisiana people for the rest of the nation to see.”

LDWF AGENT RECEIVES AWARD FOR MIGRATORY GAMEBIRD ENFORCEMENT

An LDWF-LED agent was honored by the Mississippi Flyway Council at the Oct. 7 Louisiana Wildlife and Fisheries Commission meeting in Baton Rouge.

Lt. Chad Watts, of Lecompte, received the Louisiana Waterfowl Enforcement Officer of the Year award from the Mississippi Flyway Council. The Mississippi Flyway Council recognizes law enforcement officers from each state who make outstanding contributions to the protection of waterfowl.

At the time of the application for this award, Lt. Watts was a sergeant that mainly patrolled Grant Parish. He has since been promoted to lieutenant where he is supervisor over Catahoula, Concordia, LaSalle and Winn parishes and has been an agent for over 14 years.

Lt. Watts was honored for his participation in numerous illegal waterfowl hunting investigations. His cases have involved hunting migratory game birds during a closed season and from a moving vessel, taking over the limit of waterfowl, using lead shot and hunting without licenses. His enforcement efforts also help ensure that hunters adhere to migratory waterfowl bag limits, required licenses and hunting hours.

LDWF AGENT RECEIVES BOATING SAFETY AWARD AT DECEMBER LWFC MEETING

An LDWF enforcement agent was honored at the Louisiana Wildlife and Fisheries Commission meeting this morning, Dec. 2, in Baton Rouge.

Sgt. Tim Fox, of Metairie, was recognized as this year’s NASBLA “Boating Law Enforcement Officer of the Year” award for Louisiana.

Sgt. Fox has been an agent for over 14 years and mainly patrols the waterways in southeastern Louisiana. He is a boating safety educator, certified drug recognition expert, instructor for standard field sobriety, instructor for seated battery and is currently training to be an Intoxyilizer instructor.

“Sgt. Fox is a major asset to LDWF and more specifically to the safe boating mission,” said Major Clay Marquez, who presented the award. “His most beneficial contribution to the department’s boating program is his tireless effort over his entire career to enforce boating laws on the water. He’s always fair in his discretion with the public and applies the law fairly - making the waterways in his district safer for the boating public.”

Sgt. Fox has also graduated from the U.S. Coast Guard Marine Patrol Officers Course, the Marine Law Enforcement Training Program and the NASBLA Comprehensive Accident Investigation and Analysis Course.

LDWF ANNOUNCES NEW BOATING LAW ADMINISTRATOR FOR LOUISIANA

LDWF has appointed a new state Boating Law Administrator, which will represent Louisiana on NASBLA. Major Clarence Marques, of Livingston, is replacing Lt. Col. Rachel Zechenelly as Louisiana’s Boating Law Administrator.

“I’m extremely honored to be named as the Boating Law Administrator for the state and am excited for the opportunity of continuing our safe boating mission,” said Marques. “I’ve served numerous boating safety positions with my time in the enforcement division and am ready to take on this position.”

Major Marques is originally from Chalmette and joined the LDWF Enforcement Division in 2006. Major Marques started as an agent patrolling Livingston Parish. While he was a

field agent, Major Marques also became a NASBLA Tactical Operator's Course instructor and certified in the NASBLA Officer Water Survival Course.

Major Marques was then assigned to the LDWF Enforcement Division's Headquarters Staff in 2014 in Baton Rouge as the boating education coordinator. In 2015, he received the NASBLA Boating Law Enforcement of the Year award.

From 2016 to 21, Major Marques served on the NASBLA Boat Advisory Board and is currently on the NASBLA Finance and Grants Committee. He also recently graduated from the NASBLA Leadership Academy in 2021.

LDWF AGENT RECEIVES CHARTER BOAT AWARD AT LWFC MEETING

An LDWF enforcement agent was the recipient of a Louisiana Charter Boat Association award at the Louisiana Wildlife and Fisheries Commission meeting this morning, March 3, in Baton Rouge.

Sgt. Joshua Laviolette received the inaugural Theophile Bourgeois Memorial Award for the law enforcement agent that best exemplifies the LDWF mission, specifically pertaining to promoting professionalism within the Louisiana charter for hire industry.

"Sgt. Laviolette has proven to be a dedicated, through and hardworking Enforcement Agent," said Colonel Chad Hebert, head of LDWF Enforcement. "He has been a leader in charter guide compliance and investigating guides operating without licenses. He is firm but fair, with a tenacious work ethic."

Sgt. Laviolette, of New Orleans, primarily patrols the waterways in southeastern Louisiana and has been an agent for over six years. Since 2018, Sgt. Laviolette has led LDWF Enforcement in charter guide regulation citations. Several of these citations involve unlicensed charter operators.

According to the Louisiana Charter Boat Association, the recipient demonstrates above-and-beyond performance and professionalism in the field, while also demonstrating outstanding conservation of our natural resources and promotion of Louisiana fisheries.

"Led by Col. Hebert's leadership and Sgt. Laviolette's commitment, LDWF Enforcement has done a tremendous job of increasing the professionalism of the Louisiana charter fishing industry by citing many charter violations, including unlicensed charter operators," said Louisiana Charter Boat Association Executive Director Richard Fischer. "We thank Sgt. Laviolette for his remarkable and selfless service and we look forward to recognizing LDWF Enforcement's continued success on this front."

As part of the award, the Louisiana Charter Boat Association gave Sgt. Laviolette $1,000 for a donation in his name to the charity of his choice, which was the Cure Spinal Muscular Atrophy Foundation.

The award is named after Theophile Bourgeois who was a charter captain and owner of Bourgeois Charters. His life ended in 2019 during a seaplane crash in which he was credited with saving the lives of two passengers.

"LOUISIANA LAW" FOLLOWS LDWF AGENTS, PREMIERES ON DISCOVERY CHANNEL SATURDAY, APRIL 9 AT 7 P.M.

LOUISIANA LAW follows the men and women of LDWF as they patrol one of the most geographically diverse states in the U.S. Their jurisdiction ranges from the deep forests at the Arkansas border to the lowland marshes and bayous near the coast and extends 200 miles into the Gulf of Mexico.

Louisiana's wildlife agents are tasked with protecting the natural resources of the state, but also have the authority to enforce all state and federal criminal laws. Often patrolling alone and miles from backup, agents encounter and manage dangerous situations involving both wildlife and people - all in the name of conservation. Audiences ride along on the wildlife agents' mission when LOUISIANA LAW premieres exclusively on Discovery Channel Saturday, April 9 at 7 p.m.

Nicknamed "Sportsman's Paradise" for its rich land and wildlife resources, Louisiana is home to more than one million alligators, countless crawfish, shrimp, oysters, bobcats, black bear, deer, 160 species of birds, and a wealth of fresh and saltwater fish. Fishing and hunting is a way of life for many residents; to preserve the land and protect both citizens and wildlife, agents are on call 24/7 as they patrol Louisiana's beautiful bayous, vast river deltas, and dense pine forests.

LOUISIANA LAW premieres with a man's life on the line as Sgt. Scott Dupre and Lt. Joey Thompson race to locate an elderly hunter

who's gone missing in a vast river wilderness area. Cpl. Blaine Wagner and Lt. Adam Young investigate a haul of illegal redfish dumped on a riverbank and nearby anglers who refuse to take responsibility, while Cpl. Michael Cook tracks down a suspected hunter/trespasser and finds bloody evidence tying the hunter to an illegal deer. Later, Sgt. Kurt Hatten and Sgt. Leroy Tarver crack down on a pair of hunters using illegal ammunition to shoot ducks in a protected area, and Sr. Agent Suni Nelson handles a tense encounter on the roadside.

LOUISIANA LAW is produced for Discovery Channel by Warm Springs Productions in association with Watson Pond Productions, where Christopher Voos, Marc Pierce, Chris Richardson, and Brad Johnson serve as executive producers. For Discovery, Lisa Lucas is executive producer with Katie Meloy as production coordinator.

FIRST TWO STUDENTS COMPLETE THE LDWF ENFORCEMENT DIVISION INTERNSHIP PROGRAM

LDWF-LED is announcing the first completion of their new internship program by two college students.

Brittany Stroh from South Louisiana Community College and Erica Bonvillain from Nicholls State University are the first two students to complete the LDWF Enforcement Division's internship program. They had to give a final presentation this morning, May 4, at the LDWF HQ building in Baton Rouge to receive college credit from their universities.

The LDWF Enforcement Division started their internship program this spring semester with the goal of providing college students relevant experience in conservation law enforcement and potentially a career as an LDWF Enforcement Agent.

The internship program lasts 90 to 130 hours and consists of shadowing LDWF agents in the field such as during patrols, training and outreach programs that will help them acquire a broad knowledge of LDWF Enforcement Agent activities.

College and University Internship Coordinators and Faculty that are interested in offering the LDWF Enforcement Division Internship at their college or university can contact LDWF Internship Coordinator Corporal Anthony Corner at acorner@wlf.la.gov.

PUBLIC INFORMATION

The Public Information Office handles the communication programs for LDWF. These programs cover a variety of communication outlets including publications and brochures, media relations, press releases, social media, audio-video productions, photography, and website development.

SOCIAL MEDIA

LDWF continues to strengthen constituent engagement by leveraging and enhancing its social media platforms and execution. Our constituents are taking a more active role in social media conversations and storytelling today, making our social media outlets one of the key methods of distributing department information. As our Facebook page audience continues to grow, the agency has shifted some of its social media focus to Instagram, to begin building a stronger audience base on this platform. Instagram is a great tool to showcase behind-the-scenes work at the agency that our constituents don't typically get to see. Facebook remains our strongest social channel, and thousands of questions are submitted annually through the messaging function, providing constituents another means of communicating with LDWF.

- Facebook Fans: 123,595
- Instagram Followers: 10,019
- YouTube Subscribers: 1,795
- Twitter Followers: 7,758

PUBLICATIONS

The Public Information staff is responsible for the production of specialized publications, all regulation pamphlets and the annual report. All pre-press functions, including graphic design and final printing approvals are handled by staff in this section.

Specialized publications include any publication not produced on a regular basis. These publications are used for educational, informational and promotional use for conservation management programs and special events.

LOUISIANA CONSERVATIONIST MAGAZINE

Louisiana's longest running outdoor magazine returned to print in the fall of 2016. The "Louisiana Conservationist" had been the long-standing outdoor publication for Louisiana's wildlife and fisheries enthusiasts.

The "Louisiana Conservationist" is a 90-year-old publication that began in 1917 when Lucy Powell Russell became the first female to serve as Secretary of the state's wildlife agency.

The long-term goal of the magazine is to serve as an educational outlet for anyone yearning to know more about Louisiana's outdoors, especially students. The print publication is a product of existing department staff, and available free of charge on a quarterly basis from LDWF field offices across the state. The current issue, and archived issues back to the magazine's inception in 1927 are available at *www.wlf.la.gov/page/la-conservationist*.

PHOTOGRAPHY AND AUDIO-VIDEO PRODUCTIONS

The Public Information Office is responsible for the production of specialized audio and video projects, video news releases, media footage requests, and audio recordings of various meetings. The audio and video library consists of more than 2,000 tapes of raw footage available for media and education purposes. Public Information staff is also responsible for department photography needs. Experienced photographers are on staff to help document the numerous department programs featured in LDWF news releases, brochures, posters and the "Louisiana Conservationist" magazine.

The Audio and Video Production staff assisted the department in promoting several programs throughout the year by producing educational videos and video news releases for media distribution and for viewing by the public on LDWF's website and across LDWF social media platforms. Public Information staff handle all video pre- and post-production in-house.

Public Information staff has implemented a digital storage and file sharing system for our large library of videos and photos. This searchable system archives tens of thousands of files, many of which are rare historic images from LDWF's past. Many of our videos are also shared publicly on our YouTube channel at *www.youtube.com/user/LAWildlifeFish*.

WEBSITE

The LDWF website, *wlf.louisiana.gov*, was completely redesigned two years ago. The new website is more user-friendly, easier to navigate, catalogs our publications and research in a more intuitive manner, and allows the agency to feature 'top news' on the homepage. Our new website launched on Feb. 18, 2020. Between July 1, 2021 and June 30, 2022 we had 2.2 million users to the site, 3.7 million sessions and 7.5 million page views (an increase of 115% over the same period the prior year).

2021-2022 PUBLIC INFORMATION PROJECTS

PROJECTS FOR OFFICE OF SECRETARY
Overall Projects
News Releases (501 news releases issued for the agency)
Recruitment, Retention and Reactivation of License Holders (strategic planning, grant writing, marketing, etc)
Employee Appreciation Week Activities (print and email materials, hosting events, etc.)
Website Design (concept, style guide, banners, buttons, etc.)
LDWF Digital Library
Social Media Graphics
Resources for New Hunters (website, social media, videos)
Baton Rouge Headquarters Lobby Rotating Display
Louisiana Conservationist
Fall 2021
Winter 2021
Spring 2022
Summer 2022
Brochures/Handouts
Conservation Conversations Handout
LDWF Natchitoches Programs Handout
LDWF Outreach Programs Brochure
Public Information Handout
Miscellaneous Publications
Personal Floatation Device PSA
Enforcement Intern Opportunities Poster
LDWF Pocket Directory
Ads for Printed Hunting/Fishing Licenses
Litter Posters
WAFWA/CMBA Conference Ad
Best Management Practices for Alligator Farming Booklet
Annual Publications
2020-2021 Annual Report
Videos
2022 Enforcement Commencement
Cadet Training Academy Orientation
Safe Boating “Do the RIGHT Thing!”
Become a Wildlife Agent (2022 update)
Enforcement Pre-employment Physical Fitness Assessment Standards
LDWF Overview (2022 update)

PROJECTS FOR OFFICE OF WILDLIFE
Overall Projects
Trapper Education Promotion Materials (flyers, social media, website, etc.)
Archery in Louisiana Schools/ALAS (flyers, social media, wesbite, etc.)
Chronic Wasting Disease (handouts, social media, website, etc.)
Annual Publications/Newsletters
Wildlife Insider Newsletter (Fall/Winter 2021, Spring/Summer 2022)
2021-2022 Hunting Regulations
2021-2022 Trapping Regulations
2020-2021 Alligator Advisory Committee Annual Report
2020-2021 Fur Advisory Council Annual Report
2020-2021 Alligator Program Annual Report
2021 DMAP Brochure

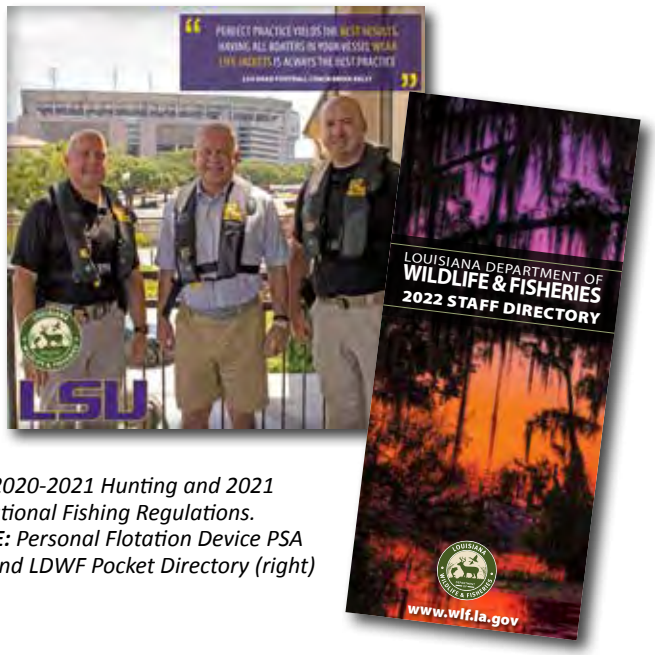
PROJECTS FOR OFFICE OF WILDLIFE (cont.)
Videos
Release of Rehabilitated Oiled Birds - Bayou Teche NWR
Pass a Loutre 100 Year Anniversary
2021 Waterfowl Stamp Competition
eTag Validation demo - via web link
eTag Validation demo - via text
LA Wallet License demo
Galva Canal - Manchac WMA
Second Release of Rehabilitated Oiled Birds - Bayou Teche NWR
Brochures/Handouts
Bear Trash Can Flyer
Dove & Teal Season ID Handout
Hunter Education Flyer
RAWA Info Handout
Squirrel ID Handout
Office of Wildlife Programs Flyer
Miscellaneous Publications
Louisiana Pearlshell Workshop Registration Form

PROJECTS FOR OFFICE OF FISHERIES
Overall Projects
Get Out & Fish! Marketing Materials (flyers, signs, brochures, etc.)
Brochures/Handouts
CARES Act Handout
Derelict Crab Trap Removal Handout
Fishing Workbooks Handout
Fisheries Biologist Job Fair Flyer
LATRIP Infographic Handout
Descend Act Pocket Card
Toledo Bend Artificial Reefs Pocket Guide
Miscellaneous Publications
Louisiana Blue Crab Fishery Management Plan
Louisiana Spotted Seatrout Fishery Management Plan
Big Bass Rodeo Program
Wrap Graphics for Mobile Touch Tank
Weir Warning Signs
Annual Publications
2022 Recreational Fishing Regulations
2022 Commercial Fishing Regulations
Videos
Get Out and Fish Spotlight - Joe Brown Park, New Orleans

LEFT: *Wildlife Insider Newsletter*
RIGHT: *Litter campaign poster*

ABOVE: *Weir and parking lot signs*

RIGHT: *Alligator Advisory Council Annual Report (left) and Fur Advisory Council report (right)*



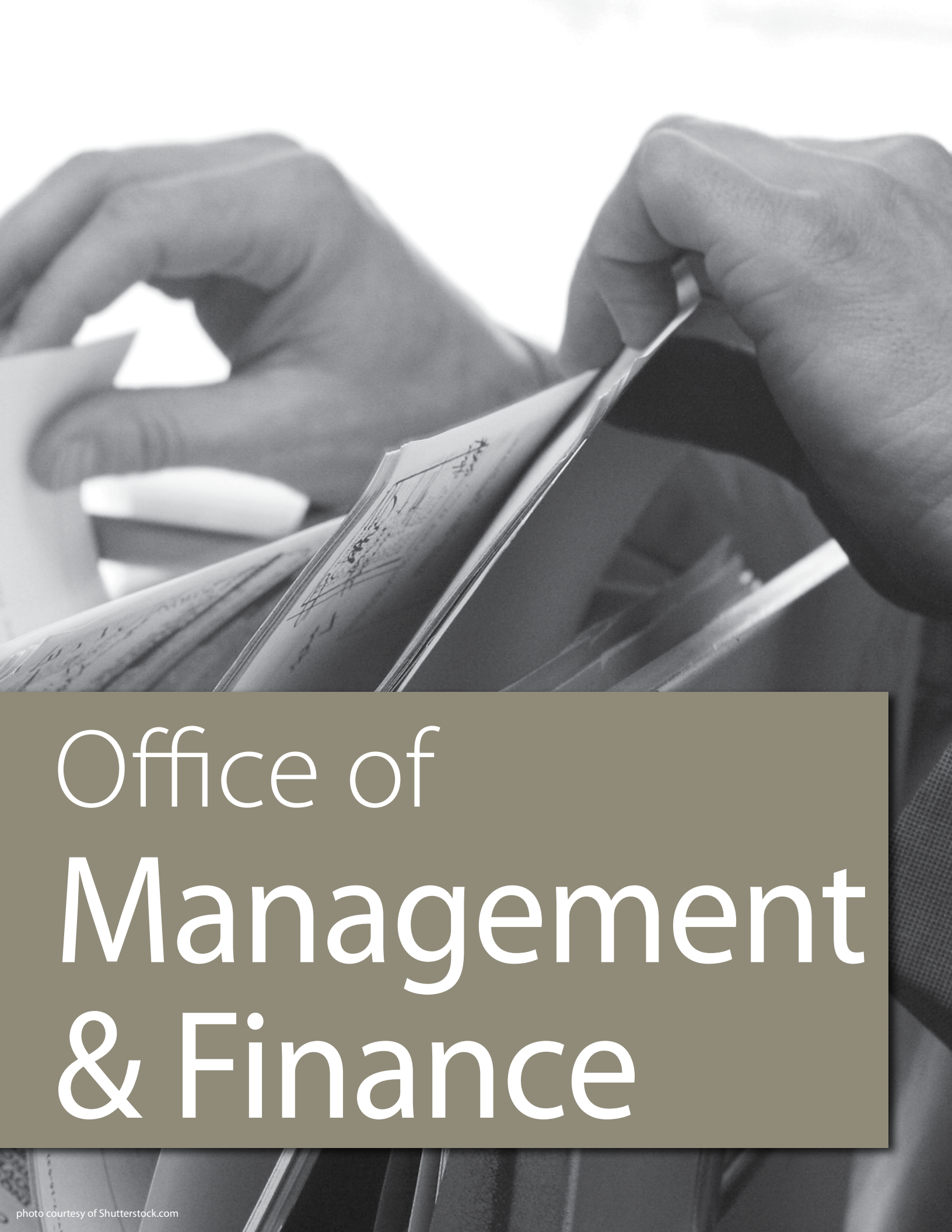
LEFT: *2020-2021 Hunting and 2021 Recreational Fishing Regulations.*
ABOVE: *Personal Flotation Device PSA (left) and LDWF Pocket Directory (right)*

LEFT to RIGHT: *LA Pearlshell Mussel Workshop registration form, Conservation Conversations handout, LATRIP infographic*

RIGHT: *Louisiana Squirrels and Dove Season ID handouts.*

RIGHT: *Descend Act pocket card (left) and Toledo Bend Artificial Reefs pocket guide (right)*

LEFT: *Louisiana Conservationist Magazine.* ***ABOVE:*** *BRHQ Lobby Rotating Display.*



Office of Management & Finance

photo courtesy of Shutterstock.com

LICENSING

The Licensing Section serves as the information hub for more than 1 million customers who operate businesses, fish commercially, recreationally fish and hunt, and use state lands for non-consumptive purposes. The staff provides customers with state, federal and commission laws, rules and regulations that govern fishing, hunting and titling/registration of boats and motors in Louisiana. The Licensing Section handles the issuance of all commercial licenses, boat and motor title and registration services, and various permits; and manages the statewide electronic licensing system providing recreational license availability at more than 700 locations statewide. The Licensing Section continues to evaluate processes and streamline to improve availability and reduce processing time for licenses and boat titles and registrations.

License and boat and motor title/registration activities and related revenue collections are as follows:

- Issued over 1.5 million recreational hunting, fishing, trapping and non-consumptive use licenses and permits sold to 800,000+ customers, generating in excess of $27 million in revenue. Maintained license records for in excess of 100,000 lifetime licensees.
- 47,600 commercial licenses sold, representing 8,600 commercial fishermen, 3,000 business entities, 1000 charter businesses, and various permits that generate in excess of $5 million in revenue.
- 344,000 boat registration/title transactions that generated in excess of $5.5 million in revenue. Maintained boat data in excess of 1 million records - 315,000 of which are actively registered.
- Made available various types of game harvest tags to deer and turkey hunters and oyster tags to oyster fishermen and processors as required by federal and state law - in excess of 3 million.

PROPERTY CONTROL

The Property Control Section is responsible for managing LDWF's Property, Risk Management Insurance Claims and Fleet Management programs. The section is staffed with three full-time employees and one student.

PROPERTY CONTROL PROGRAM

During FY 2021-2022 this program certified a moveable property inventory, which consisted of 11,304 items for a total acquisition, cost of $81,334,354.48. Annually, the program is responsible for ensuring that a physical inventory of moveable property is conducted at its locations throughout the state.

FLEET MANAGEMENT PROGRAM

In accordance with state fleet management regulations this section records, approves and processes requests for personal assignment or home storage, daily vehicle usage, vehicle maintenance, and title, registrations and vehicle licenses for LDWF's approximately 566 fleet vehicles and 1,200 other licensed equipment.

RISK MANAGEMENT PROGRAM

The Property Control Section is responsible for filing insurance claims and recovering payment from the Office of Risk Management and third party insurance companies for property damage, automobile physical and liability damage, and wet marine, aviation, boiler and machinery damage. The section is also responsible for filing general liability insurance claims.

Driver's authorization and annual certification for LDWF's approximate 785 employees is also a responsibility of the Property Control section. This process is accomplished in accordance with Office of Risk Management's loss prevention guidelines.

FISCAL

The Fiscal Section staff consists of 13 employees who are responsible for the financial operations of LDWF. The main goals of the Fiscal Section are to achieve compliance with all applicable laws, rules, policies and regulations governing the functions managed, to provide guidance and support, and to provide accurate and timely financial reports, all with exceptional customer service to all interested parties. This section also develops and implements fiscal controls, monitors program spending and provides advice, assistance and training, and standardizes procedures for approximately 800 employees.

The functions include:

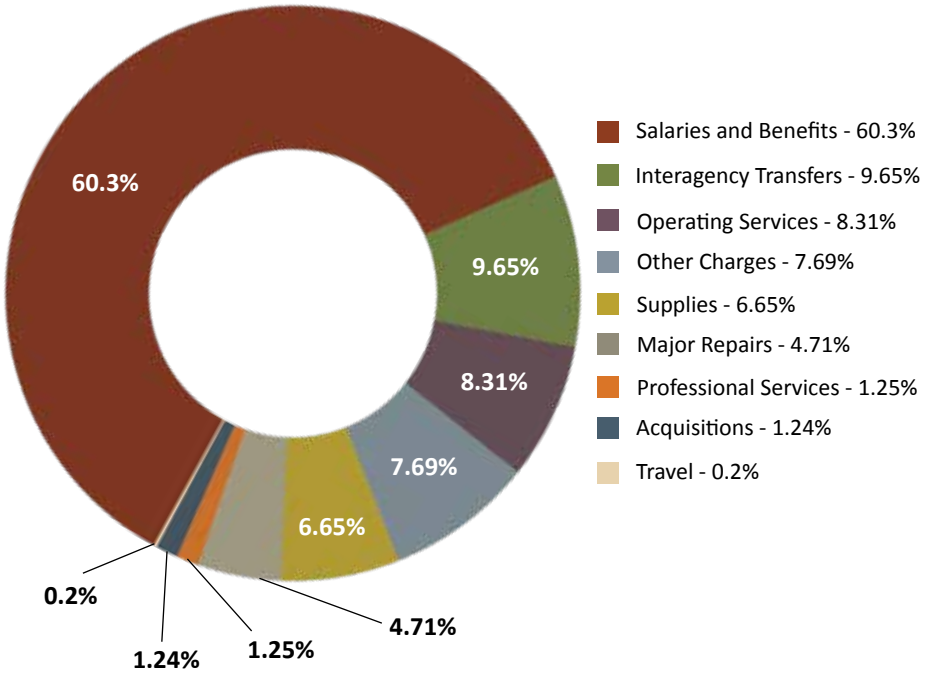
- Preparation of the annual operating and capital outlay budgets.
- Budget and expenditure control and monitoring.
- Federal grant tracking and reporting.
- Self-generated and interagency transfer agreement tracking and reporting.
- Preparation of annual financial report.
- Preparation of all required expenditure and fund financial reports.
- Reviewing and processing professional, consulting, Title 38 and Memorandum of Understanding contract payments.
- Processing of employee purchasing card transactions.
- Processing of employee travel reimbursements.
- Payment of all vendors.
- Receipt and classification of various sources of revenue.
- Fund management.
- Receipt of civil fines.
- Strategic and operational planning.
- Reviewing legislation and preparing fiscal notes.
- Consulting with internal and external auditors on all financial audits.
- Financial management of FEMA projects and other disasters.

During FY 2021-22, the Fiscal Section staff:

- Controlled and monitored four agency budgets consisting of five programs totaling $192 million.
- Monitored department capital outlay budget totaling $277 million.
- Warranted funds and prepared periodic reports for 115 federal grants.
- Warranted funds and prepared periodic reports for nine self-generated agreements.
- Warranted funds and prepared periodic reports for six interagency agreements.
- Audited and processed 640 contract invoice payments with a total amount payable of $8.5 million.
- Processed 8,885 vendor invoice payments.
- Audited and processed 9,936 purchasing card transactions.
- Audited and processed 574 travel reimbursements.
- Processed 339 checks through QuickBooks.
- Deposited $51,978,821 in receipts from various sources on 1525 pay in vouchers.

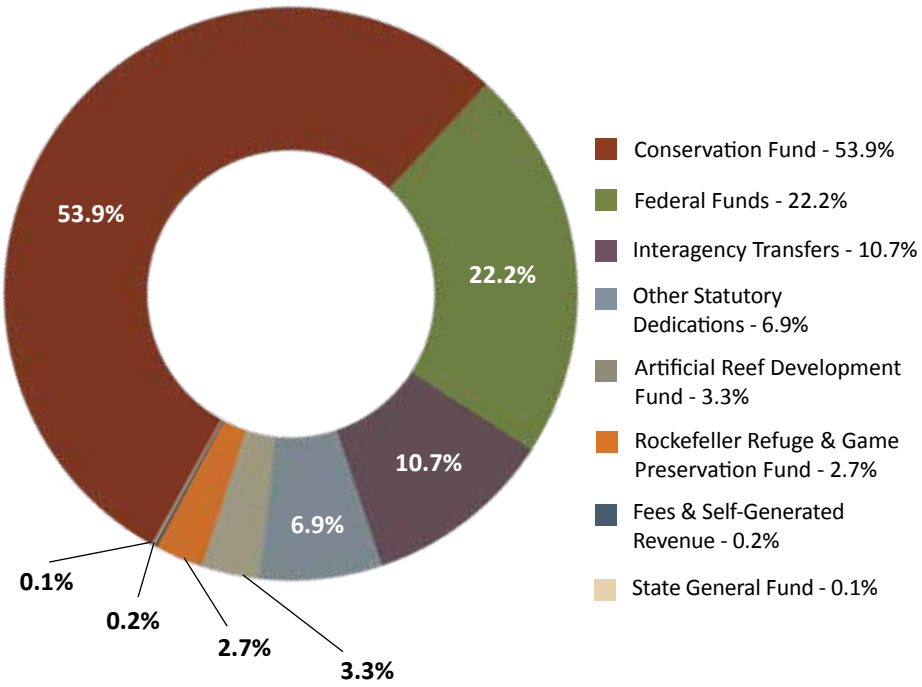
LDWF EXPENDITURES BY CATEGORY (FY 2021-2022)

Total Expenditures: $130,924,262



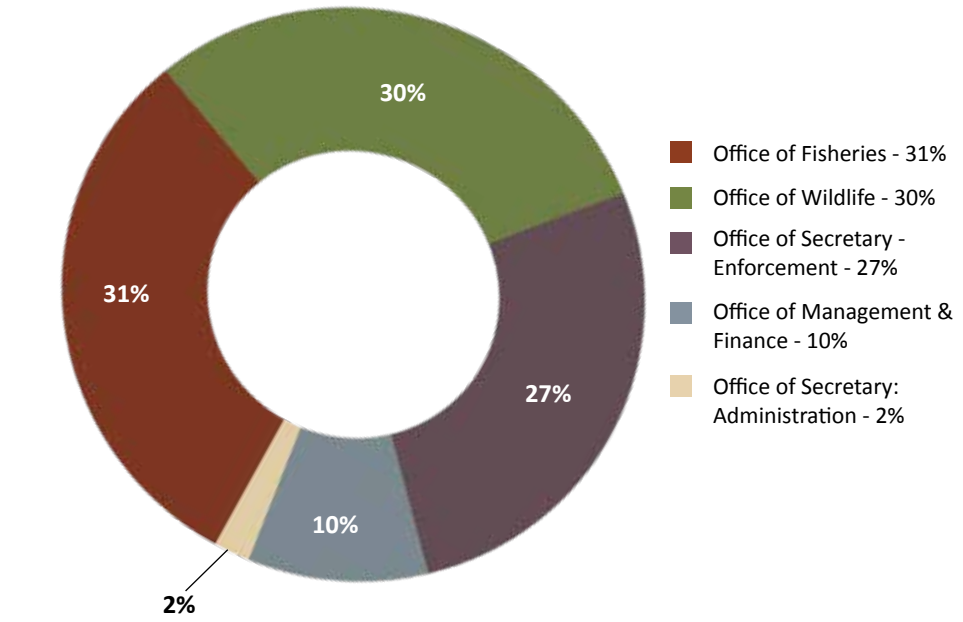
HOW EXPENDITURES WERE FUNDED (FY 2021-2022)

Total Expenditures: $130,924,262



LDWF EXPENDITURES BY PROGRAM (FY 2021-2022)

Total Expenditures: $130,924,262

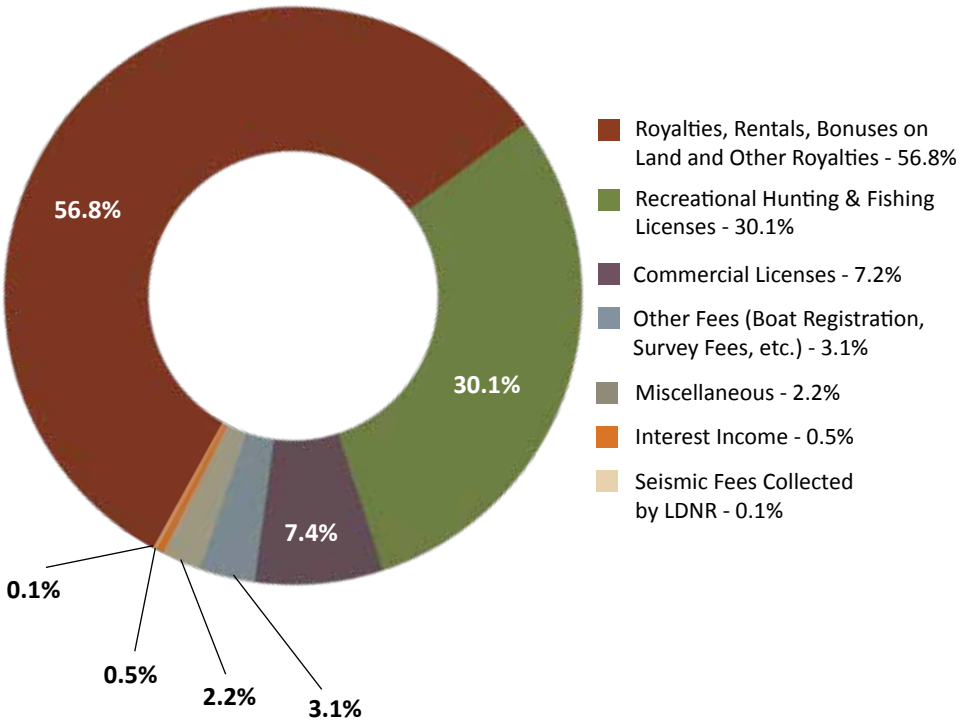


EXPENDITURES BY CATEGORY	
Salaries and Benefits	$78,945,373
Interagency Transfers	$12,632,005
Operating Services	$10,875,484
Other Charges	$10,072,412
Supplies	$8,704,338
Major Repairs	$6,167,386
Professional Services	$1,637,523
Acquisitions	$1,627,721
Travel	$262,020
TOTAL	***$ 130,924,262***

HOW EXPENDITURES WERE FUNDED	
Conservation Fund	$70,519,323
Federal Funds	$29,063,411
Interagency Transfers	$13,958,439
Other Statutory Dedications	$9,043,979
Artificial Reef Development Fund	$4,312,226
Rockefeller Refuge & Game Preservation Fund	$3,560,907
Fees & Self-Generated Revenue	$305,460
State General Fund	$160,517
TOTAL	***$ 130,924,262***

SOURCES OF REVENUE TO THE CONSERVATION FUND (FY 2021-2022)

Total Revenue: $67,632,753



EXPENDITURES BY PROGRAM	
Office of Fisheries	$40,367,792
Office of Wildlife	$39,391,575
Office of Secretary - Enforcement	$35,210,639
Office of Management & Finance	$13,124,519
Office of Secretary - Administration	$2,829,737
TOTAL	***$ 130,924,262***

SOURCES OF REVENUE TO THE CONSERVATION FUND	
Royalties, Rentals, Bonuses on Land, and Other Royalties	$38,414,027
Recreational Hunting & Fishing Licenses	$20,386,470
Commercial Licenses	$4,861,818
Other Fees (Boat Registration, Survey Fees, etc.)	$2,090,601
Miscellaneous	$1,479,682
Interest Income	$307,971
Seismic Fees Collected by LDNR	$92,184
TOTAL	***$67,632,753***

HUMAN RESOURCES

The Human Resources section originates and leads human resources practices and objectives that provide an employee-oriented, high performance culture emphasizing empowerment, quality, high productivity and standards, goal attainment, and the recruitment and ongoing development of a superior workforce. The Human Resources section is actively involved in developing, organizing and carrying out programs, projects and operations to assist in furthering LDWF's mission and goals. The section works to ensure all programs are in compliance with the Louisiana State Civil Service (SCS) rules and LDWF policies and procedures as well as state and federal laws, regulations and guidelines.

The authorized number of funded positions for LDWF for FY 2021-2022 was 783. LDWF also employs students and other temporary employees throughout the state and has a total of 855 employees statewide.

The Human Resources program areas include:

ORGANIZATIONAL MANAGEMENT

- Maintaining and/or monitoring organizational areas, costing issues, and position authority in the LaGov Human Capital Management system.
- Working with agency administrators to develop and structure organizational units and position reporting relationships.
- Assuring appropriate documentation is maintained for all employees in compliance with record and retention policies.
- Managing the human resources section of the OnBase paperless scanning system.

CLASSIFICATION & COMPENSATION ADMINISTRATION

- Reviewing job specifications and position descriptions and making recommendations for classification and compensation issues.
- Managing the position description process.
- Advising managers and employees regarding the SCS system's classification and compensation, policies, rules and structure.
- Meeting with department heads and SCS staff to address and resolve allocation and/or salary issues.
- Preparing job studies for submission to SCS.

RECRUITING, SELECTION, PLACEMENT

- Advising agency personnel and clients on recruitment and staffing matters.
- Advising section heads, appointing authorities and managers on various appointment types and selection procedures in order to create and maintain a diverse workforce.
- Serving as the LDWF system administrator for the NeoGov (LaCareers) Online Hiring Center.
- Administering the onboarding program which aids new employees in acquiring the necessary knowledge, skills and behaviors to become effective organizational members.
- Facilitating pre-employment drug testing and criminal history checks for all LDWF new employees. Managing the random drug testing process for active employees.

EMPLOYEE ADMINISTRATION

- Managing the notification process for the attainment of permanent status by probational employees and attainment of career progression group eligibility for LDWF employees.
- Developing the LDWF workforce plan and collaborating with LDWF sections to create workforce plans tailored to address specific needs/issues.
- Developing LDWF succession planning procedures.
- Managing and advising requests for unclassified and classified authority. Monitoring appointment contract end dates and requesting extensions.
- Serving as a resource for layoff-related matters and for handling administrative aspects of the layoff process to maintain compliance with the SCS rules.

DISCIPLINE, GRIEVANCES

- Working with management to investigate and address performance and behavioral incidents, grievances, appeals and other personnel matters.
- Managing disciplinary actions, SCS appeals and litigation resulting from employment actions in accordance with SCS rules and federal and state law.

PERFORMANCE EVALUATION SYSTEM

- Administering the Performance Evaluation System including reporting statistics to SCS. Training managers on the effective use of the Performance Evaluation System program and advising managers regarding performance management.

EMPLOYEE RECOGNITION

- Reviewing special pay requests for individuals under SCS rules: Optional Pay Adjustments; Rewards and Recognition; and other available pay mechanisms.

NEW HIRE ORIENTATION, BENEFITS, RETIREMENT

- Developing course materials and providing orientation to all new employees for LDWF.
- Educating and advising managers, section heads and employees on available health and life insurance policies and other programs available.
- Managing all aspects of the Annual Statewide Charitable Contribution Campaign for the LDWF.
- Assisting all active and retired employees for LDWF on all matters relating to retirement benefits.

PAYROLL, TIME ADMINISTRATION

- Conducting time and attendance audits for all LDWF agencies and auxiliaries for compliance with policies and procedures established by LDWF and/or the Office of State Uniform Payroll.
- Serving as the lead time administrator over the other section time keepers. Answering all time entry questions and providing guidance.
- Entering all prior pay period adjustments.

EMPLOYMENT LAWS

- Americans with Disabilities Act, Affirmative Action, Equal Employment Opportunity, Fair Labor Standards Act
- Advising and training employees regarding the applicability and obligations of federal employment laws (Fair Labor Standard Act, Family Medical Leave Act, American's with Disabilities Act, and Title VII) and assisting in the interpretation and administration of those laws. Managing these programs for LDWF and our employees.
- Maintaining updates on federal and state labor law postings. Assisting LDWF sections in maintaining compliance with the Fair Labor Standards Act and other state/federal pay provisions.

FAMILY MEDICAL LEAVE (FMLA)

- Managing FMLA requests including providing and reviewing the required forms, establishing eligibility, approving/denying requests and maintaining quotas

UNEMPLOYMENT

- Managing the claims made for unemployment by former employees of LDWF and clients.

POLICIES, PROCEDURES, ANNUAL REPORTING

- Developing, recommending, implementing, reviewing, interpreting and revising all LDWF personnel and compensation policies.
- Coordinating the Human Resources Strategic Plan.
- Processing all personnel/payroll actions and various other documents relating to employee status to ensure data integrity and quality assurance are maintained in accordance with SCS rules and regulations, departmental/agency policies and procedures, and federal and state laws.
- Facilitating the annual audits of human resources practices conducted by SCS, the Louisiana State Employee's Retirement System, the Teacher's Retirement System of Louisiana, the Louisiana Legislative Auditors, and the LDWF internal audit section.
- Managing public record requests specific to Human Resources.
- Managing all required human resources reporting (i.e., annual drug testing reporting to the Division of Administration, annual reporting to SCS, annual reporting to the Office of Statewide Reporting and Accounting Policy, annual Affirmative Action reporting, etc.).
- Drafting and maintaining departmental policies.
- Identifying and bringing to the attention of management employee trends which need to be addressed, current developments in labor and employment law which would impact the department, recommending implementation of best Human Resources practices in dealing with all employee matters.

WORKPLACE SAFETY

- Leading LDWF's safety program including, but not limited to, preparing Headquarters (non-Enforcement) for annual audits/compliance reviews; preparing quarterly safety meetings, providing assistance to field offices, maintaining-up-to-date Office of Risk Management training records and providing training reminders to employees, as necessary.

TRAINING AND DEVELOPMENT

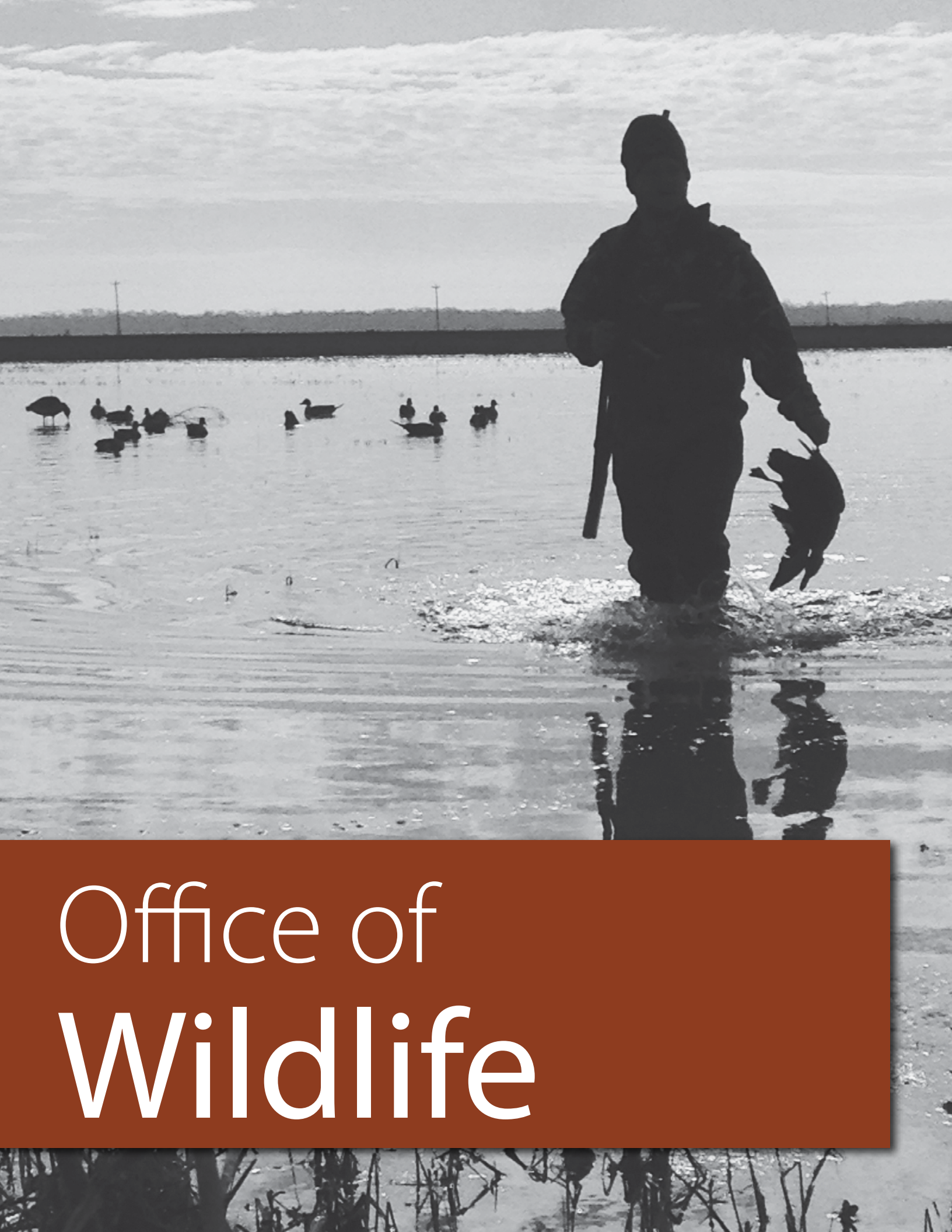
- Ensuring employee compliance with training required by law, departmental policies, SCS and Office of Risk Management.
- Monitoring compliance with Minimum Supervisory Training, training required by law and legislation such as Ethics and Sexual Harassment and required Office of Risk Management training such as defensive driving.
- Leading management development and supervisory training by providing training to supervisors and other management personnel beyond that required by the Comprehensive Public Training Program and ensuring that these employees are aware of required training and training resources.

WORKER'S COMPENSATION

- Advising employees and coordinating with Office of Risk Management/Sedgwick concerning all issues relating to Workers' Compensation.
- Administering LDWF's Return to Duty policy for employee's suffering on-the-job illness/injury.

The table below highlights of some of the actions that were processed by Human Resources staff in FY 2021-2022. This is not an all-inclusive list of every action processed.

ACTION PROCESSED	NUMBER
Position Description Reviewed and Processed	147
Applications Received and Reviewed	2,759
New Hires	127
Retirements	30
Separations	81
Career Progression Group Reallocations	35
Promotions	685
Market Adjustments	680
Miscellaneous Entries	356
Performance Evaluation System (PES) Documents Processed	1,435
Worker's Compensation Claims	32



Office of Wildlife

WILDLIFE DIVISION

WILDLIFE RESEARCH

A wide range of research and management work is conducted in order to maintain healthy productive populations of wildlife and to provide wildlife associated recreational opportunities for citizens to enjoy. Louisiana Department of Wildlife and Fisheries (LDWF) staff biologists conduct research and surveys for use in formulating hunting regulations and for development and management of habitat. They present information to the public and develop workshops for LDWF personnel and other agencies. In addition, the staff represents LDWF on state, regional and national committees, providing input to a wide array of public agencies, non-governmental organizations and private industry. The species programs are White-tailed Deer, Webless Migratory Birds, Wild Turkey and Resident Small Game, Waterfowl, Large Carnivore, and Wildlife Disease.

WHITE-TAILED DEER

During the statewide 2021-2022 deer season, 208,200 deer hunters harvested an estimated 233,400 white-tailed deer. The estimated harvest exceeded the previous 10-year high by more than 20%. The estimated sex ratio of deer harvested for a third consecutive year was 55% male and 45% female. The estimated number of deer harvested and hunters was derived from the annual online hunter survey. While the annual mail survey has been used since 1970, 2022 marked the third year that all surveys were conducted online. Both mail and online surveys were used to estimate harvest trends for the 2016-2017, 2017-2018, and 2018-2019 hunting seasons in order to determine compatibility between the two methods.

LDWF managed wildlife management areas (WMAs) provide abundant opportunities for public land deer hunters. LDWF staff collects biological data from deer harvested during the WMA-managed deer hunts through mandatory deer checks at designated weigh stations on pre-determined days. While not all deer are checked throughout the season, the mandatory checks serve to collect an adequate sample size of known age deer harvest data for the purpose of monitoring the health and productivity of the deer herd. WMA hunters harvested 1,750 deer during the WMA-managed deer hunts. While deer harvest on WMAs has been trending down over the past 10 seasons, harvest per effort has been better over that same period . Fewer hunters participating in the hunts has contributed to the lower harvest but the percentage of hunters bagging a deer has increased over the same period. The result is an increase in available days outside of the managed hunt weekends for deer hunters where data supports. A combination of harvest, habitat and user data is utilized to adjust the number of available deer hunting days and hunting allowances. Collection of the user data is achieved through the use of self-clearing permits with both digital and paper options. Habitat monitoring and management is part of an extensive forest management plan as well as browse surveys which serve to measure the relationship between deer and available forage. This balance is important for ecosystem health and the health of all species that depend on the habitat provided by the WMA. Each WMA is managed independently for deer based on data collected for that particular site.

Mandatory tagging and reporting of deer entered the 14th year in 2021. Similar to the estimated harvest derived from the online survey, reported harvest was up from the previous season. More deer were reported in the 2021-2022 season than any of the past 10 seasons. Mandatory deer tagging and reporting data is used by LDWF biologists and managers to assess deer population parameters by parish and deer area. The percentage of bucks and does, number of deer reported by hunter, and harvest trends derived from the reporting system are recorded and assessed at the parish and deer area level.

The Deer Management Assistance Program (DMAP) provides detailed statewide harvest information while providing the largest known age sample of physical deer data. The cooperative between properties enrolled in DMAP and LDWF allows the agency to provide technical assistance for enrolled properties while those same properties collect known age harvest data for LDWF. The DMAP harvest last season was 12,152, a 1% decrease from the previous year. More than 1.4 million acres were enrolled in DMAP. Since the 685 participating properties are located in every major habitat type in the state, the data collected provides valuable insight into deer condition across Louisiana. DMAP harvest rates were one deer per 115 acres for the second consecutive season. In addition to known age measurements of harvested deer, habitat data is also collected in the form of browse surveys. A total of 71 browse surveys representing more than 180,706 acres were conducted on properties enrolled in DMAP during 2021-2022 season. Browse availability and utilization is recorded and assessed utilizing a browse transect survey. These indices provide managers an in depth analysis between available browse

resources and utilization by deer on the landscape. DMAP cooperators continue to harvest a high percentage (80%) of 3.5-year-old and older age bucks. That number was good enough to be second best in the nation as reported in the 2022 National Deer Association Report.

Utilizing deer harvest data from the previously mentioned programs allows managers to assess deer health and harvest at the parish, WMA, deer management area and statewide level. Deer regulations are influenced by these evaluations.

LDWF continues to maintain an active Louisiana records program for deer and turkey. Minimum qualifications have been established by weapon type for deer. A total of 19 bucks meeting the minimum qualification for the recognition program were reported by hunters in 2021-2022. In addition, 10 of the 19 bucks that met the recognition program requirements also qualified for the all-time Louisiana Big-Game Records. Four bucks qualified for the Boone and Crockett Recognition and three bucks harvested with a bow qualified for Pope & Young. The Louisiana Big Game Records Recognition Program and State Records List is available on the LDWF website. All entries are officially measured and there is no charge for participation in the records program.

Unfortunately, Louisiana became the 29th state to detect chronic wasting disease. Chronic wasting disease is a neurodegenerative disease that is transmissible and 100% fatal to deer. The result from the positive 8.5 year old Tensas Parish buck was reported on Jan. 28, 2022. The diagnosis was confirmed a week later by the National Veterinary Services Laboratory in Ames, Iowa. Due to the positive detection, the LDWF Chronic Wasting Disease Response Plan has been activated. Mitigation measures include the prohibition of bait and deer carcass export restrictions. These measures were implemented for the Chronic Wasting Disease Control Area, which consists of the immediate area of the detection as well as a buffer area around the known positive. At this time, parish boundaries and major roadways beyond 25 miles of the index case are utilized for Chronic Wasting Disease Control Area boundaries.

LDWF collected 1,602 chronic wasting disease samples in 2021-22 and 13,551 since 2002. The bulk of samples are collected directly from hunters, but LDWF secured additional samples from deer hit by vehicles, taxidermists, processors and target deer which include symptomatic deer. In addition, an effort to incentivize sampling through a promotion was sponsored by the South Louisiana Branch of the National Deer Association. A $1,000 gift card was given to the hunter with the winning entry. A second gift card for $500 was issued to the winning taxidermist. Eligibility included the submission of a chronic wasting disease sample from a Louisiana buck with a 10 inch or greater inside spread. The goal was to increase the number of 2.5 year and older bucks sampled. Adult bucks are priority samples based on their tendency for higher prevalence rates where the disease is endemic.

Hunters wishing to have their harvested deer tested for chronic wasting disease are encouraged to visit the LDWF website at *www.wlf.la.gov/page/cwd-testing* and follow the steps outlined, or call the nearest LDWF Field Office for assistance. Surveillance efforts are necessary for early detection. Additional drop-off locations are planned for the Chronic Wasting Disease Control Area in 2022. Hunters will be able to bring deer heads to designated drop off sites within the Control Area for submission by following the instructions provided. Locations will be listed on the LDWF website. Proactive measures such as following recommended disposal practices as well as limiting the placement of bait on the landscape could help slow the spread of chronic wasting disease. More on chronic wasting disease and current Chronic Wasting Disease Control Area regulations is available at *www.wlf.la.gov/page/cwd*.

WEBLESS MIGRATORY BIRDS

DOVE

Dove hunting regulations for Louisiana in 2021-2022 were set at 90 days with a bag limit of 15 birds. A survey of resident license holders indicates that approximately 22,800 Louisiana hunters harvested approximately 429,600 doves during the 2021-2022 hunting season. Additionally, an estimated 5,900 Eurasian collared doves and 20,500 white-winged doves were also taken.

In addition to dove fields on 12 WMAs, LDWF leases property from one private landowner for public hunting. This land is leased for public hunting on opening day only. In 2021, one field totaling 300 acres was leased. During the opening day hunt, 132 hunters participated, bagging 393 doves.

In the spring of 2003, U.S. Fish and Wildlife Service (USFWS) adopted a National Mourning Dove Harvest Management Plan. Determining current harvest rate in each management unit was identified as a key component of the plan. Wildlife Division personnel banded 771 doves during July through August 2021 as part of a national effort to provide information needed to develop harvest rate estimates for mourning doves. Another aspect of this study has been the development of production indices from mourning dove wings collected from hunters. A Wildlife Division biologist participated in the annual Mourning Dove Wing Bee. Due to COVID-19 travel restrictions, the Wing Bee was held remotely. Biologists were mailed wings and they aged them at their respective domiciles. State and federal biologists from across the country aged more than 40,000 wings.

WOODCOCK

LDWF bands woodcock annually in order to determine impacts of hunting on woodcock populations in the state via direct recoveries. As part of this project, 300 woodcock were banded. This project is ongoing.

Due to the COVID-19 pandemic, the USFWS did not hold its Annual Woodcock Wing Bee. Instead, biologists were mailed woodcock wings and they aged and sexed woodcock based on wing patterns at their respective domiciles. LDWF had one biologist participate in this Wing Bee. Data derived from aging and sexing about 8,100 woodcock wings were used to develop trend data on woodcock production and hunter success. These data, in combination with breeding bird surveys, are used to develop management strategies for woodcock. Although many people in Louisiana consider woodcock an under-utilized species, Louisiana's harvest of woodcock at one time ranked among the nation's highest. However, the number of woodcock hunters has decreased by over 90% since their peak in the early 1980s. Nonetheless, Louisiana still consistently ranks fourth in the nation for woodcock harvest. A survey of resident license holders indicates that approximately 3,000 Louisiana hunters harvested 20,000 woodcock during the 2021-2022 season.

ANNUAL HUNTER HARVEST SURVEY

Big and small game harvest indices for the 2021-2022 hunting season were obtained through an online survey based on the purchases of basic resident hunting licenses or any other resident license that included the basic resident hunting privileges for 2021-2022. The 2021-2022 Game Harvest Survey

was emailed to 12,734 (6% sample of email addresses) residents who had purchased the license for the current year's hunting season (or had a lifetime license). The survey questionnaires were completed and returned by 3,006 individuals before the cutoff date. The estimated harvest and hunter efforts for the 2021-2022 hunting seasons utilized 2,383 responses. The procedures used to calculate the 2021-2022 estimates were the same as those used for the 2020-2021 harvest estimates. The 2021-2022 harvest estimates were extrapolated based on the current year's license sales of 274,906. Hunter numbers reflect those that hunted a species even if they did not harvest an animal. No attempt was made to adjust the statistics to compensate for the lack of residents under 16 years old who are not required to purchase a basic license.

WILD TURKEY & RESIDENT SMALL GAME

WILD TURKEY

The most recent turkey hunter survey estimated 24,200 turkey hunters harvested approximately 9,100 wild turkeys during the spring of 2022. Both the estimated turkey hunter numbers and the estimated turkey harvest increased significantly from that of 2021 estimated hunters increased approximately 23.5 % while harvest increased approximately 65.5%. The number of recreational days spent turkey hunting (143,500) also increased approximately 16.6% compared to 2021 (123,100).

A poult production survey was initiated in 1994 to assess annual brood rearing success and monitor long-term production trends. The 2021 Summer Wild Turkey Survey indicates an increase in average poult production for the North Mississippi Delta region and a decrease for all other regions over last year's index. Two management regions, the Western Longleaf Pine and the Atchafalaya South Mississippi Delta regions, had fewer than 20 total observations. Fewer observations decrease confidence in the survey estimates. There could be numerous reasons for this including lack of survey effort due to other activities such as storm cleanup and a low local turkey population. Long-term (28-year) declines ($P < 0.0001$) have been occurring in turkey PPH production for four of five habitat regions; these regions are producing fewer poults each year. The only habitat region not experiencing a long-term decline in PPH production is the Southeast Loblolly Pine region.

LDWF is involved in several wild turkey research projects. In 2015, a research project was initiated on Peason Ridge WMA and Kisatchie National Forest to study female wild turkey movements and production in relation to habitat improvements. In 2019, this project was extended and expanded to include Washington, Tangipahoa and St. Helena parishes in southeast Louisiana. This work is being done in conjunction with Louisiana State University (LSU) and U.S. Forest Service (USFS) and is scheduled for completion in 2023. LDWF is also engaged in banding gobblers on the Kisatchie National Forest. Banding and subsequent reporting by hunters of banded gobblers provides information needed to estimate wild turkey harvest rates. Collectively 147 wild turkeys were captured and tagged as part of these research projects in 2022.

SMALL GAME

Squirrels and Rabbits

Small game populations and harvests are highly dependent on year-to-year habitat conditions. As a result, it is common to see more variation in populations and harvests of small game species when compared to other species from one year to the next. The 2021-2022 harvest survey results indicate that there were approximately 52,400 squirrel hunters in Louisiana, which is a decrease of 2.4% from 2020-2021. Total harvest estimates increased 4.8% to 772,500 squirrels for 2021-2022. The number of rabbit hunters is estimated at 16,400, which is a 10.8% increase from the previous year. In addition, estimated rabbit harvests increased 15.2% from the previous year to 100,000.

To expand small game hunting opportunity, LDWF has established Small Game Emphasis Areas on the following WMAs: Big Colewa Bayou, Bayou Macon, Bayou Pierre, Boeuf, Dewey Wills, Pomme de Terre, Richard K. Yancey, Russell Sage, Sandy Hollow, Sherburne, Tunica Hills, and Walnut Hill WMAs. Within these WMAs on that portion designated as the Small Game Emphasis Area, small game hunting and training with dogs is allowed for extended periods of time throughout the season and year. Specific dates vary as hunting regulations indicate each year.

LDWF staff continued a research project in Southeast Louisiana assessing home range size and habitat use of Bachman's fox squirrels. In the Winter of 2019, LDWF staff deployed 10 GPS/VHF collars on Bachman's fox squirrel on two separate study sites in south-

east Louisiana. Data collection began with deployment in East Feliciana and Tangipahoa parishes. LDWF staff deployed another three collars in 2021 and collected home range and habitat data through 2022. A final home range/habitat summary is currently being developed and set to wrap up in 2023.

Quail

Statewide fall whistling counts were conducted on four randomly located routes and an additional five routes on LDWF WMAs and the Kisatchie National Forest. All regions continue to exhibit significant long-term (1983-2021) declines in calls per stop. Spring bobwhite surveys were also conducted on the Sandy Hollow WMA and Kisatchie National Forest. Inferences about population status and habitat conditions were developed based on the results of these surveys during the breeding season.

A survey of resident license holders indicates that approximately 1,000 Louisiana hunters harvested 1,800 wild quail during the 2021-2022 season. Hunters were also asked about their harvest of pen-raised quail. About 2,300 hunters harvested an estimated 52,000 pen-raised quail.

LDWF continues to work with its partners to address the decline in bobwhite populations. Habitat development efforts using U.S. Department of Agriculture (USDA) Farm Bill programs and the State Wildlife Grants Program have been implemented to promote management practices such as prescribed burning. LDWF is also partnering with the USFS to assist in habitat management on a Quail Emphasis Area on Kisatchie National Forest to promote and develop quail habitat on approximately 6,000 acres.

WATERFOWL

Louisiana has approximately 3.5 million acres of coastal marsh that winter large and diverse waterfowl populations. Aerial waterfowl inventories of the entire coastal marsh, as well as associated agricultural lands and managed wetlands in the Mississippi Alluvial Valley and northwest Louisiana are conducted each winter.

The estimate of 1.3 million ducks calculated for the 2021 November aerial waterfowl survey, consisting of 27 coastal transects and Catahoula Lake, was a 51% increase from the record low estimate of 855,000 ducks in November 2020 and the highest November estimate since 2017. It was lower than the most recent five-year (1.5 million) and 10-year (1.7 million) averages. Louisiana's only major storm of 2021 was Hurricane Ida (Category 4), tied with 2020's Hurricane Laura as the strongest hurricane on record for the state. It made landfall Aug. 29 southeast of Houma and did widespread damage to marshes in Terrebonne and Barataria Bays. Waterfowl abundance in the southeast marshes was mostly confined to the eastern margin of the state. Nearly the entire state experienced warm dry conditions from October through December. The last week of December experienced daily high temperatures in the high-80s. Cold weather finally arrived with some rain at the beginning of January 2022. The duck estimate for January increased to 2.1 million, a 43% increase from the December count and a 4% increase from the previous January (2021). However, it was 9%, 16%, and 28% lower than the most recent five-year, 10-year and long-term averages, respectively. The 85% decline in ducks at Catahoula Lake (268,000 to 38,000) is not uncommon as Catahoula is surveyed during the open hunting season in January and can experience significant disturbance. January estimates for mallard, mottled duck, gadwall, and wigeon were record lows for January counts in Louisiana for those species. Blue-winged teal, scaup, ring-neck, and canvasback were above their January long-term average.

The special scaup survey, flown on lakes Maurepas, Pontchartrain and Borgne increased 462% and 93% from the previous year December and January, respectively. The 44,700 scaup estimated in December increased from 8,300 in 2020 and the January count rose to 29,000 from 14,500 in January 2021.

MID-WINTER WATERFOWL INVENTORY

The mid-winter waterfowl inventory is a USFWS coordinated effort including other states that winter waterfowl. The Louisiana effort includes the January coastal, Catahoula and scaup survey with the addition all other major waterfowl habitats throughout the state. The 2022 mid-winter total included 2.37 million ducks and 499,000 geese. Duck numbers increased 5% from 2021 and were 20% below the most recent 10-year average. The goose estimate decreased 7% from 2021 and was 15% below the most recent 10-year average. Species composition of the goose estimate included 463,000 light geese (snow geese & Ross' geese) and 36,000 greater white-front-

ed geese. The white-fronted goose estimate was a 63% decrease from the 95,000 counted in 2021 and 63% below the most recent 10-year average.

Based on federal harvest estimates, 37,300 active duck hunters (down 2.4% from 38,200 in 2020) spent 263,000 days afield, for an average of seven days per hunter during the 2021-2022 season. Total duck harvest was 495,000 during the 2021-2022 season, a 19% decrease from the 2020-2021 season. Duck harvest per hunter also decreased to 16.5 from 19.7 (-16%) the previous year. Blue-winged teal were harvested in the greatest numbers (216,000) followed by green-winged teal (124,000), gadwall (79,000) wood duck (46,000), and northern shoveler (31,000). Mallard harvest decreased 35% from 23,000 to 17,000 in 2021-2022.

Goose hunter estimates also declined. An estimated 7,100 goose hunters (down 5% from the 2020 season and the 35% below the most recent five-year average) averaged 5.5 days afield (-6% from 2020 and +14% the most recent five-year average) for a total of 40,000 total days. Success increased, as total goose harvest was estimated at 43,000 (up 43% from 30,000) for an average seasonal harvest of 6 geese per hunter. Greater white-fronted geese made up 55% of the harvest, light geese 45%, and Canada geese less than 1%.

Use of the federal harvest data over LDWF's Big and Small Game Harvest Survey is necessary because federal data 1) are collected the same way in every state allowing for comparison over states and times which likely index changes in distribution and local abundance, 2) are species specific, and 3) include age-ratios in the harvest which are the most important large-scale index to reproductive success on the breeding grounds. The federal-estimated harvest of 495,000 ducks included 44% blue-winged teal, 25% green-winged teal, 16% gadwall, 9% wood ducks, 6% northern shoveler, 5% of both ring-necked and northern pintail, 4% lesser scaup and 3% mallard. Wigeon, canvasback, bufflehead, redhead, greater scaup, goldeneye and ruddy duck comprised the remainder in order of harvest.

NORTH AMERICAN WATERFOWL MANAGEMENT PLAN

Louisiana continues to play an important role in the North American Waterfowl Management Plan as LDWF maintains ongoing projects and other activities associated with the goals of the North American Waterfowl Management Plan. In FY 2021-2022 the Sherburne farms North American Wetlands Conservation Act project was completed after lengthy weather-delays. This consisted of levelling work as part of the completed tasks that included the replacement of water control structures, levee repair, installation of a well, and land contouring. Additional projects in the northern part of the state have been identified and discussions are ongoing for the funding of these projects.

The Louisiana Waterfowl Project, a private land conservation partnership between LDWF, Ducks Unlimited, USDA Natural Resources Conservation Service (NRCS), USFWS, and private landowners completed three projects, totaling 5,002 acres. There are four projects for the upcoming fiscal year totaling 2,797 acres. There are five projects that have been approved by the committee and are currently under development that total 790 acres. All but two projects (that totaled 60 acres) were located in southwest Louisiana in priority mottled duck nesting and brood rearing habitat. There are currently 81,334 acres under wetland development agreements. The Louisiana Waterfowl Project has now enhanced a cumulative total of 126,046 acres of wetlands statewide since its inception in 1992. Two new projects in the Gulf Coast Joint Venture's Chenier Plain Initiative Area were initiated, developed, and funded. Sites are currently being identified for enrollment. The Louisiana Mottled Duck Project, also a partnership with Ducks Unlimited, incentivizes landowners to manage vegetation and hold water on coastal properties during spring and summer months for mottled duck brood habitat. The Coastal Grasslands Restoration Initiative Program, a Gulf Coast Joint Venture partnership, provides technical and financial assistance to reclaim and enhance working coastal lands to provide cover for grassland birds, especially nesting mottled ducks.

WOOD DUCKS

During 2021-2022, LDWF banded 2,146 wood ducks, which is 40% less than the 3,568 banded last year. Pre-season rocket-netting accounted for 2,061 of the total bandings, and 85 hens were captured in nesting boxes. In addition, 245 black-bellied whistling ducks were banded during the winter and spring. This is far lower than the 1,600 banded last year due to the training of new employees in trapping, sexing, and banding techniques. Plans include increasing the distribution of banding sites throughout the state to build a more representative database that may have to depend on recaptures rather than hunter-recoveries to obtain information on movement and survival of these birds and support future harvest management decisions.

The wood duck nest-box program completed its 33rd year in 2022. LDWF personnel maintained 1,764 and monitored 1,723 of those boxes in spring 2022. That is an 4.5% decrease in maintenance from last year and still below the annual goal of 2,000 boxes. There were major losses of boxes in the Hammond region as a result of Hurricane Ida. Replacement of deteriorating boxes and those lost to flooding, as well as relocating both unused boxes and those with high rates of dump-nesting to more suitable habitat continues to be a focus of this program. A four-year research project was initiated in February 2020 with a goal of assessing breeding ecology of wood ducks and black-bellied whistling ducks using boxes in central Louisiana. In 2022 researchers intensively monitored 325 boxes on Sherburne and Thistlethwaite WMAs and Indian Creek Reservoir within Alexander State Forest WMA. Bi-weekly visits found 271 of those boxes (83.4%) were used by wood ducks, black-bellied whistling ducks, or hooded mergansers at some time during the 2022 nesting season. 2022 data shows 345 nest attempts by wood ducks resulted in 122 (35.4%) successful nests and 156 (45.2%) failed. An additional 67 (19.4%) were still active at the end of the reporting period. Black-bellied whistling ducks (70), and hooded mergansers (64) also attempted nests in the boxes. Twenty-nine (41.4%) black-bellies have hatched, 24 (34.3%) are currently active, and 17 (24.3%) have failed.

LARGE CARNIVORE PROGRAM

LARGE CARNIVORE RESEARCH

Of the 16 American black bear subspecies, the Louisiana black bear is the only to have received formal protection under the United States Endangered Species Act; listed as threatened in 1992. Recovery and delisting of the bear occurred in April 2016. Therefore, LDWF's current bear research efforts are mostly targeted at long-term monitoring to collect the critical demographic, genetic and spatial information required to effectively monitor population health. This information will also be used to sustainably manage bear populations into the future.

2021-2022 Bear Research

1. Reproductive Vital Rates -
To collect information on reproductive vital rates, we attempted to conduct den visits across all four bear subpopulations during February and March 2022 to count and mark cubs-of-the-year, and to count yearlings. Den visits and cub counts were attempted on 36 collared females. Sixteen cubs of the year were observed during den visits. During cub counts 10 cubs and 12 yearlings were observed.

2. Survival and Mortality -
To monitor survival and cause-specific mortality, we maintained bears outfitted with VHF or VHF-GPS radio-collars. Using monthly aerial telemetry, we monitored radio-collared bears from all four subpopulations during 2020-2021. We documented mortalities during FY 2021-2022, Most known mortalities are from roadkills. Fifty-seven road kills were documented during 2021-2022.

3. Abundance, Density and Growth -
To estimate abundance and density and monitor temporal changes in population growth in the Corridor/Richard K. Yancey complex we conducted spatially explicit hair snare work during the summer 2021; 210 hair snares were monitored for six weeks. Hair snare traps allowed us to collect hair samples. All collected samples will be sent to Wildlife Genetics International for microsatellite genotyping at eight to 21 markers, depending on study objectives.

BEAR MANAGEMENT

LDWF personnel responded to 255 human-bear conflict calls from the public and other government agencies. Response varied from technical assistance being provided over the phone to site visits with recommendations provided to reduce conflict and trapping. During FY 2021–2022, we captured 12 bears to address human-bear conflict issues reported to LDWF.

Work continued with the U.S. Geological Survey (USGS) to improve the BearTrak database, and USGS is working to update and add additional features to the online database.

EDUCATION AND OUTREACH

The Large Carnivore Program Manager attended The Southeast Association of Fish and Wildlife Agencies Large Carnivore Working Group meeting to discuss Sarcoptic mange in black bears. A National Fish and Wildlife Foundation grant was awarded to provide a BearWise outreach position within LDWF. The BearWise program is now being taken national to be included under the umbrella of the Association of Fish and Wildlife Agencies.

In continuation of our black bear outreach, the majority of efforts conducted in FY 2021-2022 centered on exhibition and presentation of information and displays to schools and other interested groups around the state.

Bear Safety in Mind (St. Mary Parish Program)

Accomplishments during 2021-2022 include:

- Maintained close communications with biologists to assist specific call areas by working with caller reporting the nuisance bear behavior to ensure all bear proofing efforts were being implemented in the area with the nuisance bear problems.
- Daily monitoring of bear proof cans to assist the homeowner or small business with questions, damages and procedures to further bear proof their property and facilities.
- Work closely with Pelican Waste to monitor bear proof garbage cans and bear proof dumpsters concerning residential and small business compliance with waste hauler and new procedures for services.
- Pelican Waste has completed the delivery of bear resistant garbage cans to the expanded use areas in Patterson. The new areas of use for the bear resistant cans are located North of U.S. Highway 90 and affect almost 1,000 residents.
- Besides assisting residents of St. Mary Parish with repairs and replacements of damaged bear resistant garbage cans, time is provided for additional education in home/property bear proofing measures through written, internet and verbal communications with assessments of nuisance bear activities during and after any implementations of shared measures.
- Provided door to door outreach opportunities through door knob bag distribution campaigns sharing bear proofing informational flyers as well as open conversations with concerned homeowners of these outreach areas.
- The City of Franklin is working with Pelican Waste & Debris to expand the use of bear proof garbage cans in areas with nuisance bear activities.
- The City of Franklin is also drafting an ordinance regarding bear proofing and for the residents to use the bear resistant garbage cans correctly.
- Worked closely with the Public Works Director for St. Mary Parish, Parish Council Member, Rodney Olander and Cypremort Point residents to improve services at the Louisa Road/Cypremort Point Bridge dump site. The fence and gates have been repaired so now the gates are chained closed every evening by the St. Mary Parish Sheriff's Department to help deter the bears from getting into the dumpsters. The property outside the fence area has been cleared and cleaned of all garbage piled by the bears. New signs and rules have been implemented at this site as well as new bear proof dumpsters.
- Assisted residents with repairs, lost and stolen bear proof cans throughout St. Mary Parish and the municipalities of Berwick and Patterson. We make a site visit to each location with a broken or "lost" garbage can to assess the condition of the can and/or the property to make further suggestions for bear proofing. We also monitor the area to make sure Pelican Waste and Debris repairs or replaces the bear can in a timely fashion.
- Working with St. Mary Parish to change and implement more bear proof dumpsters at parks and public sites like Elizabeth Davis Park in the Four Corners area, Sorrell Park, Burns Point and Verdunville Boat Launch.
- Working with residents in the Ashton/Four Corners/Sorrel area with nuisance bear activities.
- The Parish is negotiating plans with Pelican Waste & Debris for the use of residential bear resistant garbage cans in the Ashton/Four Corners/Sorrel, which are the western most area of St. Mary Parish south of U.S. Highway 90.
- Working with Pelican to help provide additional hardware for better locking capabilities of bear resistant cans for use in the high bear activities areas South of U.S. Highway 90 throughout St. Mary Parish.
- We delivered bear resistant garbage cans to residents establishing new waste services in the "bear can" designated areas so I may provide flyers, property assessments, reference websites and contact information related to black bear activities and deterrents.

WILDLIFE HEALTH

The statewide Wildlife Health and Disease Monitoring Program is administered by the state wildlife veterinarian, the assistant state wildlife veterinarian and the wildlife disease biologist.

As part of the LDWF white-tailed deer chronic wasting disease surveillance program, 1601 samples were collected statewide for chronic wasting disease surveillance. Samples were submitted to the Louisiana Animal Disease Diagnostic Laboratory at the LSU School of Veterinary Medicine. This brings the total number of wild white-tailed deer tested in Louisiana to 13,556 animals since the inception of the program in 2002.

One deer, an 8.5+ year-old buck from Tensas Parish tested positive for chronic wasting disease. Upon receiving confirmation of the positive chronic wasting disease result from the National Veterinary Services Laboratory, LDWF instituted its Chronic Wasting Disease Response Plan.

The program continued statewide white-nose syndrome surveillance, collecting samples from nearly 1,000 live bats for *Pseudogymnoascus destructans* (Pd). Samples were submitted to the USGS National Wildlife Health Center and the Pathogen and Microbiome Institute at Northern Arizona University. Pd was detected for the first time on Mexican free-tailed bats in Natchitoches Parish. Additionally, winter and summer transportation structure surveys were conducted at over 1,000 sites in conjunction with 36 mobile acoustic surveys for population monitoring.

Additional projects included feral hog toxicant research, , surveillance for SARS CoV-2 in white-tailed deer, surveillance for *Tritrichomonas foetus* in white-tailed deer, and surveillance for blood parasites in wild turkeys, coronavirus sampling in conjunction with Bat Conservation International, presence of viral pathogen in bats with LSU School of Environmental Science.

LAND DEVELOPMENT & MANAGEMENT

Hardwood plantation thinning to enhance wildlife habitat.

Taping of an outreach video on Richard K. Yancey WMA.

Seedlings being loaded for a restoration project on Soda Lake WMA.

FORESTRY PROGRAM

The mission of the Forest Management Program is to improve forest and wildlife habitat on WMAs though sound forest management, reforestation practices, and active forest/wildlife research activities. To demonstrate wise stewardship of LDWF's forests, 545,695 acres of forestland is certified through the Sustainable Forestry Initiative Program. LDWF completed its fifth surveillance audited and was found to be in accordance with the requirements of the Sustainable Forestry Initiative Standard.

General forest inventories and habitat evaluations were conducted to facilitate the development of management prescriptions and to evaluate the effectiveness of prescribed treatments for Boeuf, Bayou Macon, Dewey Wills, Grassy Lake, Richard K. Yancey, Sandy Hollow, Sherburne and Russell Sage WMAs.

Harvest preparations including forest inventory, regeneration evaluations, timber marking, GIS map development, timber sale proposal preparations, timber sale development, contract development, and timer contract amendments were conducted on Bayou Macon, Boeuf, Dewey Wills, Richard K. Yancey, Russell Sage, and Sandy Hollow WMAs. Harvests to improve wildlife habitat were initiated and/or completed on Dewey Wills WMA and Sandy Hollow WMAs.

As a result of depressed timber markets across most of Louisiana, non-commercial timber treatments were prescribed to improve wildlife habitat on Grassy Lake and Elbow Slough WMAs. Treatment were used to improve forest structure, enhance hard and soft mast production, provide patches of dense understory to serve as important escape cover, and to stimulate understory and midstory development.

Chemical treatments of invasive/non-native species, primarily Chinese tallow tree, cogon grass, and trifoliate orange were carried out on Boeuf, Dewey Wills, Grassy Lake, Sandy Hollow, Spring Bayou, and Russell Sage WMAs

Prescribed burning treatments were conducted on Alexander State Forest, Lake Ramsay, Little River and Sandy Hollow WMAs to promote and improve habitat conditions for fire dependent wildlife and plants.

The annual statewide WMA mast survey was conducted to estimate annual mast production. The survey is used as an indicator of mast availability for wildlife as well as a predictor of small mammal populations. The mast survey is also used to map local abundance which aids in seed collection efforts.

Our reforestation program inventoried and evaluated hardwood plantations on LDWF-owned WMAs as well as private properties. Habitat evaluations and management

***LEFT:** Planting of a reforestation project on Soda Lake WMA.* ***RIGHT:** Non-commercial forest treatments to improve wildlife habitat on Elbow Slough WMA.*

plans were developed for four bottomland hardwood restoration sites on properties enrolled in the NRCS Wetland Reserve Program. Evaluations of state-owned properties include Boeuf, Buckhorn, Richard K. Yancey, and Russell Sage WMAs. Research continued on several ongoing studies investigating seedling survival, sapling development, tree growth and wildlife response to various silvicultural treatments. Our reforestation program restored approximately 300 acres through reforestation on Soda Lake WMA.

Our GIS program continues to update timber sale data, forest inventory, boundaries, prescribed burning, roads, and streams data input relative to our WMA forest management activities. The forestry GIS allows us to monitor, analyze, and evaluate for performance and outcomes of the entire forestry program.

Growth Monitoring Plots were reevaluated on Big Colewa Bayou, Grassy Lake, and Little River WMAs. These permanent plots aid in monitoring habitat conditions and effects of our forest management program on the habitat components represented on the WMAs.

Other survey and research projects on the WMAs that were supported by Forestry Section staff involved wildlife use of forested habitats and their response to various silvicultural treatments. Forestry Section staff hosted several training and outreach workshops to share research results and management experiences. Continuing education for the Forestry Section staff was practiced through participation at various symposiums, workshops, seminars, research meetings and conferences throughout the year, in and out-of-state.

WILDLIFE MANAGEMENT AREAS

The Wildlife Division of LDWF currently manages over 1.3 million acres in its WMA Program. These areas are distributed across the state and are comprised of a vast array of habitat types. The WMA Program's mission is to deliver conservation priorities to Louisiana's landscape, as well as provide an array of outdoor recreational opportunities to the public. The lands in the program serve to protect, conserve, replenish and manage the wildlife resources occurring on those areas. Habitats within these lands harbor and help conserve a multitude of endangered species such as the red-cockaded woodpecker and gopher tortoise. The majority of these lands are available for the public to utilize in recreational pursuits. Recreational opportunities range from a variety of hunting and fishing, to canoeing, hiking, ATV riding and berry picking. Habitats range from upland pine-hardwood, to cypress tupelo, pine savanna, bottomland hardwood, fresh to brackish marshes, with many globally rare habitat types and plant communities as well. For administrative and management purposes, the WMAs are grouped by region - Hammond, Lafayette, Lake Charles, Pineville, Monroe and Minden regions.

HAMMOND

Wildlife Management Areas (*Total Acres - 255,186 acres*)

- Biloxi
- Hutchinson Creek
- Joyce
- Lake Ramsey Savannah
- Manchac
- Maurepas Swamp
- Pearl River
- Sandy Hollow
- Tangipahoa Parish School Board
- Tunica Hills

Habitat types on these WMAs include marshes and swamps, natural longleaf and plantation loblolly pine stands, bottomland hardwoods, and rugged loess bluff uplands. The WMAs are managed to provide outdoor recreational opportunities for all user groups. Most of the areas are accessible via extensive road and trail systems that are maintained by LDWF staff, while other areas are accessible mainly by boat.

A total of 44,995 user days were estimated for Hammond WMAs during FY 2021-2022. An alligator season was available on Joyce, Manchac, Maurepas Swamp and Pearl River WMAs with a harvest of 900 alligators by 16 commercial alligator trappers. Alligator applications were reviewed, and licenses and tags were issued to 77 WMA lottery hunters who filled 124 tags. This lottery hunt is done through an application process, with each hunter selected receiving three tags. This gives the public an opportunity to participate in the alligator harvest program. Hammond WMA personnel on Joyce, Pearl River, Manchac and Maurepas Swamp WMAs monitored alligator egg collections. A total of 10,496 eggs valued at $104,960 were collected.

Hammond WMA personnel maintained existing WMA boundaries, buildings, equipment, roads and trails. Managed public hunts were also conducted on two WMAs. Combined results for managed deer hunts were 335 hunter efforts with a total of 10 deer harvested. On the 10 WMAs managed by the Hammond Office, 218 deer were harvested.

Lake Ramsey WMA.

Litter cleanup on Maurepas Swamp (above) and Joyce (below) WMAs.

This reduction in hunter efforts and harvest can be attributed to impacts of Hurricane Ida and Maurepas Swamp and Joyce WMAs being bucks only for modern and primitive firearms seasons.

LDWF personnel issued Special Use Permits for oil and gas actives along the vast pipeline infrastructure that traverses several WMAs within the region. These routine maintenance projects were coordinated by staff to allow for efficient access by work crews while also limiting WMA user conflicts. There are several large projects that are impacting Maurepas Swamp that have required interagency coordination. The West Lake Shore Protection Levee and Hope Canal River Reintroduction have similar impact areas. The Air Products CO^2 storage and corresponding new pipeline meetings were also attended. These projects have weekly coordination meetings and LDWF staff works diligently to ensure that construction impacts to the WMA are minimized and that LDWF's wildlife management goals are met.

Through the application of prescribed fire, 1,245 acres of longleaf pine on Sandy Hollow WMA and 796 acres on Lake Ramsay Savannah WMA were managed.

Hammond personnel maintained eight wood duck boxes. This reduction in wood duck nest boxes was a result of impacts of Hurricane Ida. Personnel also participated in the statewide mourning dove banding program, responded to numerous deer and nuisance animal complaints, provided technical assistance to the public, conducted public meetings, and collected white-tailed deer brain and lymph node samples across the region for chronic wasting disease testing.

Feral hogs have become a serious nuisance and ecological threat throughout the state. Aggressive control methods have been used on certain WMAs, such as Pearl River and Tunica Hills, to reduce their numbers. Each year, feral hog blood samples are collected and tested for a variety of diseases.

The Hammond Region Operations program offers assistance to the public in 17 parishes on a variety of wildlife related topics and programs. Biologists conducted data collection for research programs, disease monitoring, habitat evaluations, Wetland Reserve Easement monitoring, drafted habitat management plans for private landowners, conducted public outreach, and offered technical assistance regarding wildlife and nuisance animal issues. The DMAP program was delivered to 120 cooperators on more than 215,730 acres. In addition, staff participated in several bird banding programs for wild turkey, wood ducks, woodcock and mourning doves. During 2021-2022, regional personnel banded 57 wood ducks, 100 black-bellied whistling ducks and 49 woodcocks. These numbers are down drastically due to the impacts and office closures from Hurricane Ida. Region biologists conducted 50 Private Lands site visits offering technical assistance to landowners regarding wildlife and habitat management for 4,681 acres.

LAFAYETTE

Wildlife Management Areas (*Total Acres - 190,848 acres*)

- Acadiana Conservation Corridor
- Attakapas
- Elm Hall
- Grassy Lake
- Pomme de Terre
- Richard K. Yancey
- Sherburne
- Spring Bayou
- Thistlethwaite

Habitat types range from backwater bottomland hardwoods interspersed with agricultural lands, and cypress-tupelo swamps to open-water areas. One USFWS refuge (Atchafalaya National Wildlife Refuge) and two U.S. Army Corps of Engineers (USACE) properties (Bayou des Ourses and Shatters Bayou) are managed within the Lafayette region.

Lafayette WMA personnel administer and manage a variety of wildlife-oriented activities. These personnel work in conjunction

Boy Scout project on Sherburne WMA.

ABOVE: *Litter cleanup on Spring Bayou WMA.*
BELOW: *White ibis on Pomme de Terre WMA.*

with and provide technical advice to many different agencies, including USFWS, USACE, Louisiana Department of Natural Resources (LDNR), Louisiana Department of Environmental Quality, USDA and local parish entities. Lafayette WMA personnel helped deliver alligator and nuisance animal programs and assisted with program projects such as dove and wood duck banding, as well as deer, woodcock, turkey, black bear and nongame research projects.

The WMAs are maintained and managed to provide outdoor recreation opportunities for all user groups, including both consumptive and non-consumptive. WMA personnel performed a variety of development and maintenance functions such as boundary marking, building maintenance, road maintenance, water control structure operation, moist soil management, beaver and other nuisance animal control, farm contract supervision, equipment maintenance, public user data collection, vegetation control, food plot planting, reforestation, and conducting managed hunts.

A total of 96,927 user days were reported on Lafayette WMAs during FY 2020-2021.

White-tailed deer is the most popular game animal hunted on the Lafayette WMAs. Either-sex deer hunts, with mandatory deer checks were held on the WMAs, with 2,760 user-days recorded and 344 deer harvested. An additional 900 deer were harvested during other either-sex, bucks-only, youth/handicapped, archery and primitive weapons hunts, where self-clearing permits were utilized. Deer hunters totaled 20,600 efforts for the 2021-2022 season. Turkey hunts were held on four WMAs, where seven turkeys were harvested by an estimated 236 users. This includes nine youth hunters who participated in the, Sherburne, Spring Bayou and Pomme de Terre WMAs youth lottery hunts. In typical years, guides are provided for the youth turkey hunt on Sherburne WMA. However, this year was unguided due to COVID-19 restrictions and uncertainty. Squirrel and rabbit hunting is also very popular on the ecoregion's bottomland hardwood WMAs, accounting for over 10,750 user days. Waterfowl hunting is very popular as well on Lafayette WMAs in moist soil impoundments, green tree reservoirs, swamps and flooded bottoms. Waterfowl user days totaled over 5,700 for this period. Dove fields are maintained, along with many acres of wildlife openings.

Youth lottery deer and duck hunts were also held on Lafayette WMAs, with great success on these hunts. Fifteen youth waterfowl lottery hunters harvested 66 ducks, for an average of 4.4 ducks per youth hunter. A disabled veteran's waterfowl hunt was held where six disabled veterans participated and harvested 30 ducks, for an average of five ducks per hunter. Forty youth deer lottery hunters harvested 11 deer on nine hunts. Youth hunters observed many deer on the hunts. The hunts are held in refuge areas set aside for youth, where these youth hunters have a quality hunt and learn about hunting in a safe environment. Three different Physically Challenged Hunter Permit wheelchair hunters on 12 hunts utilized wheelchair-bound waterfowl and deer hunts.

Biologists and technicians maintain and monitor approximately 500 wood duck boxes,

conduct pre-season wood duck banding, and collect samples for chronic wasting disease, avian influenza and other disease testing. They also assisted with numerous nuisance animal complaints, illegal captive deer and sick deer complaints. Biologists assisted researchers with ongoing research projects.

Alligator applications were reviewed, and licenses and tags were issued to 144 WMA lottery hunters who filled 400 tags. This lottery hunt is done through an application process, with each hunter selected receiving three tags. This gives the public an opportunity to participate in the alligator harvest program.

There were also five contract alligator hunters who bid on tags on the WMAs. These hunters filled 208 tags.

Major projects being initiated, worked on, or completed included:

- North American Wetlands Conservation Act project on Sherburne WMA
- Upgrade Spring Bayou WMA Old River Landing
- Spring Bayou Road construction
- Spring Bayou Camping Area renovation which included newly upgraded electrical and water systems
- Renovation of office building on Richard K. Yancey WMA.

Routine maintenance activities on Lafayette region areas included road grading, culvert replacement, road and trail repairs, drainage improvements, beaver control, boundary work, sign replacement, self-clearing station maintenance, vegetation control, equipment maintenance, and facility upkeep. Repairs on all WMA roads and trails were made as funding allocations allowed.

COASTAL LAFAYETTE

Wildlife Management Areas
(*Total Acres - 321,411 acres*)

- Atchafalaya Delta
- Lake Boeuf
- Pass-a-Loutre
- Pointe-aux-Chenes
- Salvador
- Timken

Refuges
(*Total Acres - 93,274 acres*)

- Marsh Island
- State Wildlife
- St. Tammany
- Isle Dernieres Barrier Islands
- Queen Bess

Habitats on these WMAs/refuges are primarily fresh, intermediate and brackish marshes with some agriculture lands, bottomland hardwoods and cypress-tupelo swamp. Most of the WMAs/refuges in this region are only accessible by boat and include two active deltas and three barrier islands. The majority of the Coastal Lafayette WMAs/refuges are owned by LDWF with the remaining acreage under lease. St. Tammany Refuge is managed in cooperation with the USFWS along with Big Branch National Wildlife Refuge.

The Coastal Lafayette Region WMAs/refuges are maintained and managed to ensure optimum habitat conditions as well as provide outdoor recreational opportunities for all user groups. A total of approximately 22,000 user days were estimated for Coastal Lafayette WMAs and refuges during FY 2021-2022. Fishing, crabbing and shrimping make up the majority of the activities on some WMAs/refuges in this region. The most popular consumptive activities include hunting, fishing, crabbing and cast-netting for shrimp. Nonconsumptive uses include boating, camping, bird watching and nature photography. To facilitate public use, Coastal Lafayette staff maintained parking lots, docks, bridges, boat ramps and campgrounds as well as posted boundaries and provided public assistance (including emergency assistance to boaters).

Wetland management, enhancement, restoration and protection activities are high priorities on the Coastal Lafayette WMAs/refuges. Staff strive to manage all wetlands on these areas whenever feasible. In general, Coastal Lafayette WMA/refuge wetlands are managed to provide appropriate water levels and conditions (salinity, turbidity, flow) to optimize wetland health and wintering waterfowl conditions, establish/increase desired wetland vegetation and ensure proper habitat conditions for fisheries and other wildlife. Annual wetland management and enhancement activities included water level and salinity management, prescribed burning, species management, vegetative plantings, dredging/beneficial use, etc. There are 12 active management units on three of these WMAs/refuges (Pointe-aux-Chenes WMA, Marsh Island

***LEFT:** Preparing to make improvements on the Pass-a-Loutre campground.* ***RIGHT:** Pass-a-Loutre WMA campground after improvements.*

Aerial view of improved Pass-a-Loutre WMA campground.

Refuge and State Wildlife Refuge). These management units total approximately 45,000 acres and are managed via 25 water control structures. Staff routinely monitor water quality and conditions and adjust water control structures appropriately to ensure proper management. Staff continue to maintain and repair all water control structures, levees, etc. to ensure these management units function properly. During FY 2021-2022 several projects designed to improve wildlife habitat quality were either implemented, completed, or moved forward in the process to be implemented. On Marsh Island Refuge, contractors completed the replacement of a water control structure in March 2021; levee breaches made for access to the project site continued to remain open. LDWF is exploring options to address these breaches. Additionally, on Marsh Island Refuge, bids were received to replace two water control structures (Northeast Unit and Joe Aucoin) which came in significantly over budget ($2.6 million). Current plans are to revise the design of the water control structures and re-bid the project during FY 2022-2023. Two crevasse projects were completed on Pass-a-Loutre WMA during FY 2021-2022 both of which will improve waterfowl habitat conditions on the WMA as well as provide for better public access. Five crevasses were created throughout the WMA with funding provided through a North American Wetlands Conservation Act grant. The second crevasse project on Pass-a-Loutre was funded through the Coastal Wetlands Planning, Protection and Restoration Act where two new crevasses were created and one existing crevasse was cleaned out to restore its function. In addition to the crevasses constructed during FY 2021-2022, LDWF applied for a permit to construct or cleanout three additional crevasses on Pass-a-Loutre WMA; plans are to complete these crevasses during FY 2022-2023. Additionally, USACE continued dredging South Pass on Pass-a-Loutre WMA and completed that project at the end of January 2022. Spoil material from this project will be used beneficially on Pass-a-Loutre WMA; additionally, this project will improve navigation on South Pass as well as improve water flow down South Pass which will benefit habitat by allowing more water and sediment to flow into the crevasses on South Pass. On Atchafalaya Delta WMA, six crevasses were constructed or extended to improve waterfowl habitat and public access. Funding for this project is from Ducks Unlimited. During FY 2021-2022, Ducks Unlimited was awarded a North American Wetlands Conservation Act grant to fund the purchase of Couba Island (Timken WMA) for LDWF. Timken WMA is currently under lease from the City Park Improvement Association and is comprised of approximately 2,585 acres of fresh and intermediate marsh. The purchase of Couba Island should be finalized during FY 2022-2023. Finally, on Pointe-aux-Chenes WMA construction for the replacement of two water control structures (S1, S3) on the Pointe-aux-Chenes Unit began and is expected to be completed during FY 2022-2023.

Coastal Lafayette staff continued to identify needs and search for funding opportunities to address habitat related work (including coastal restoration) on these WMAs/refuges. Staff work with federal, state and local government agencies (NRCS, U.S. Environmental Protection Agency, USACE, USFWS, Coastal Protection and Restoration Authority [CPRA]), non-governmental organizations (Ducks Unlimited, Restore the Earth), universities and private landowners for assistance with possible projects, partnerships, and funding opportunities to address habitat issues. Staff routinely worked closely with the USACE for maintenance dredging of the lower Mississippi and Atchafalaya rivers and associated beneficial use of dredge material. Staff continued to work with Restore the Earth on an ongoing effort to restore cypress swamp on Pointe-aux-Chenes WMA and Salvador WMA. Coastal Lafayette personnel assist with project field trips and inspections, data collection and research as needed.

Waterfowl are the most popular animal hunted on the Coastal Lafayette WMAs. Coastal Lafayette staff manage wetlands on WMAs/refuges to provide optimum wintering waterfowl habitat conditions. The 2021-2022 waterfowl season was from Nov. 13, 2021 - Jan. 30, 2022 (closed Dec. 6-17 and Jan. 3-9) on coastal WMAs. Self-Clearing permits submitted by hunters showed that 3,099 hunters hunted on the coastal WMAs harvesting 8,280 waterfowl for a success of 2.67 birds per hunter effort. The 2021-2022 teal season was from Sept. 11-26, 2021. Self-Clearing permits submitted by hunters showed that 719 teal hunters hunted on the Coastal Lafayette WMAs this year during the September teal season. These hunters harvested an estimated 2,053 teal for a success of 2.86 teal per hunter effort.

Deer are the second most popular game animal hunted on Coastal Lafayette WMAs. Self-clearing permits revealed that 784 deer hunter efforts yielded 59 deer harvested during the 2021-2022 hunting season on Coastal Lafayette WMAs. This equates to a success of one deer for every 13.3 efforts. Due to Hurricane Ida all of the youth lottery deer hunts at Pointe-aux-Chenes WMA that normally occur over the first two weekends of October were cancelled. The majority of the deer hunter user days and deer harvested on coastal WMAs were on Atchafalaya Delta WMA.

Coastal Lafayette staff continue to conduct species management related activities as well as provide assistance as needed to species management programs including research assistance, habitat assessments and updates, surveys, harvest data collection, species updates, waterfowl banding efforts (mottled ducks, black-bellied whistling ducks and gallinules), etc. Personnel regulated and monitored alligator and furbearer harvest activities on the Coastal Lafayette WMAs/refuges. A total of 770 alligators and 12,120 nutria were harvested on these WMAs/refuges for FY 2021-2022. Fifty-four WMA lottery alligator hunters harvested 56 alligators. Approximately 70 acres of dove fields were maintained on Pointe-aux-Chenes WMA and many acres of wildlife openings maintained on all WMAs.

Pointe-aux-Chenes WMA pier construction.

Coastal Lafayette Region staff continued to assist LSU AgCenter researchers collect data on the Roseau cane scale on Pass-a-Loutre WMA. Assistance provided included providing vessel support to aid researchers in data collecting quarterly throughout the WMA.

Coastal Lafayette Region staff continued working with state and federal partners to develop and implement many recreational use projects with the goal of improving campgrounds as well as hunting and fishing access on Pointe-aux-Chenes and Atchafalaya Delta WMAs. During FY 2021-2022 fishing access improvements were completed on Pointe-aux-Chenes WMA. Additional campground improvement projects on Atchafalaya Delta WMA should be completed during FY 2022-2023.

Personnel also reviewed, commented on and monitored oil and gas production activities, facilities and spills as well as and other easement related activities on all Coastal Lafayette WMAs/refuges.

Additional routine maintenance activities on the Coastal Lafayette region areas included road maintenance, sign replacement, self-clearing permit kiosks maintenance, vegetation control, public user data collection, equipment maintenance, facility/building maintenance, etc. Coastal Lafayette region staff demolished the Marsh Island Refuge headquarters, boat shed and airboat shed due to continued deterioration and damages from multiple hurricanes.

During the 2021 hurricane season Hurricane Ida caused significant impacts to buildings and equipment on Pointe-aux-Chenes WMA. The Pointe-aux-Chenes WMA headquarters was a total loss and subsequently demolished by staff. Some repairs have been made and we are working continuously to repair/replace infrastructure and equipment damaged by these storms.

LAKE CHARLES

Wildlife Management Areas
(*Total Acres - 299,995 acres*)

- Clear Creek
- Fort Polk-Vernon
- Marsh Bayou
- Peason Ridge
- Sabine Island
- Walnut Hill
- West Bay

Habitat on these WMAs includes bottomland hardwoods, upland hardwood bottoms, pine plantations, natural pine stands, and mixed pine-hardwoods.

There were a total of 37,442 user days for Lake Charles WMAs during FY 2021-2022. These areas are readily accessible and very popular with the public. Along with public hunting and fishing opportunities, these areas provide many types of non-consumptive outdoor activities. Managed deer hunts were conducted on several of the WMAs to collect accurate information on herd health and hunter success rates. Collectively, managed deer hunts on Lake Charles WMAs resulted in 4,078 hunter efforts accounting for 601 deer harvested.

A youth deer hunt was held on Clear Creek WMA with 134 participants harvesting nine deer. Also, a youth/physically challenged hunt was held on West Bay with 177 efforts harvesting seven deer. Total deer hunting efforts on Lake Charles Region WMAs were 22,274 efforts with 1,467 deer harvested.

Eight physically challenged wheelchair bound hunting blinds where established on Clear Creek (4) and Fort Polk-Vernon (4) and utilized by the public who otherwise might not have any place to hunt. Future expansion of this program is expected.

Area infrastructure was an important goal during FY 2021-2022 with 146 miles of roadway graded by Lake Charles personnel. In addition, 386 miles of roads and trails were bush hogged on the WMAs; all infrastructure work was conducted as part of the "In-kind Service" agreements between landowners and LDWF for these WMA leases. Another infrastructure responsibility was the marking of WMA boundary lines with a summation of 89 miles completed for this job activity.

Youth-only lottery turkey hunts were held on Clear Creek, Fort Polk-Vernon/Peason Ridge and West Bay WMAs with 43 participants harvesting six gobblers. The Fort Polk-Vernon/Peason Ridge Lottery Youth Turkey hunt was a guided hunt where selected youths were provided guides, food and transportation to a hunting area predetermined by LDWF. These hunts were intended to get young hunters into the field that may not otherwise have an opportunity to hunt.

Most Lake Charles WMAs were leased to LDWF from private and government entities (Manulife Investment Management, Roy O. Martin, U.S. Army, USFS, Agvictus Capital Management, Calcasieu Parish School Board, Rayonier, and the State of Louisiana) for public use from the landowners. WMA landowners do not receive direct payments for the leases. Instead the owners are compensated through a combination of tax exemptions, road maintenance, mowing, prescribed burning contracts, reduced theft and vandalism (due to regular presence of LDWF staff), as well as public goodwill. To continue these lease areas, LDWF personnel are required to meet and negotiate annual agreements with the landowners. The leases help the landowners and LDWF to properly manage and maintain these properties for wildlife and public recreation.

***ABOVE:** Self clearing permit station on Clear Creek WMA. **BELOW:** Litter cleanup on West Bay WMA.*

Prescribed burning was conducted on Marsh Bayou WMA with a total of 112 acres burned and 5 miles of firebreaks installed. This burning operation improved upland habitat for a variety of wildlife species including songbirds, turkey, deer, reptiles, amphibians and small mammals. An additional 1,500 acres were burned on Peason Ridge with wma staff assisting Army Post Fire Section employees.

Wildlife openings were maintained by mechanical control through fallow disking to allow native forbs and grasses to regrow and agricultural planting of desirable forage totaled 293 acres. Manipulation of certain areas is accomplished to maintain an early successional stage for landowner operations as discussed in adopted lease agreements.

Lake Charles Region WMA personnel participated in a variety of Wildlife Division activities. These include environmental assessments, technical assistance, research, planning, development, management, and alligator and nuisance animal programs. Over 38 wood duck nesting boxes were maintained and monitored by Lake Charles WMA personnel. Routine trapping and banding of wood ducks and mourning doves was conducted on WMAs.

Feral hog control operations continued by shooting and trapping on all WMAs. Several WMAs required the removal of nuisance beavers.

Lake Charles WMA staff assisted with a joint (USFS, U.S. Army and LDWF) turkey project on Peason Ridge WMA. A total of 65 turkeys were trapped and banded; all hens were fitted with tracking transmitters. The project will continue into the next fiscal year as part of an on-going research program.

Personnel also reviewed and monitored oil and gas production activities and interstate pipeline installations on several Lake Charles WMAs. No new oil and gas exploration occurred on state-owned properties.

Private Lands Program

During FY 2021-22, Lake Charles Region biologists conducted 81 Private Lands site visits offering technical assistance on 41,848 acres. They produced 27 comprehensive written habitat management plans for landowners, provided 310 technical assists by mail, telephone, office visits and email, assisted 247 callers with nuisance and injured wildlife complaints, and they fielded 1,483 requests for information from the public. Under an agreement with NRCS, staff conducted 25 Wetland Reserve Easement property inspections to assess conditions and make recommendations for management.

Lake Charles Region biologists are also responsible for carrying out activities such as migratory and resident bird surveys and banding, collection of biological data for research, habitat evaluations, disease investigations, administration of the alligator program, delivery of the DMAP program to 35 cooperators on more than 98,000 acres, and public outreach via workshops, events and media outlets. Private Lands and WMA staff participated in the wood duck, woodcock, and dove banding programs, banding 543 wood ducks and 41 woodcock on private lands. In addition, biologists conducted four prescribed burns on private lands, four quail whistle surveys, three dove survey routes, four deer browse surveys, and assisted with turkey banding and research on Kisatchie National Forest.

PINEVILLE

Wildlife Management Areas (*Total Acres - 90,594 acres*)

- Alexander State Forest
- Camp Beauregard
- Dewey W. Wills
- Elbow Slough
- Little River
- Sabine

The Pineville region is arguably the most ecologically diverse region in the state. If you were to visit all six of the WMAs, you could experience cypress swamps and sloughs, riparian habitat, mature hardwood bottomlands, mixed hardwood and pine uplands, natural and commercial pine timberland, as

ABOVE LEFT: *Sabine Island WMA.* ***ABOVE RIGHT:*** *Fishing on Sabine Island WMA.* ***BELOW:*** *Deer harvested on Dewey Wills WMA.*

well as managed and mature longleaf pine habitat. In the Pineville region, a WMA user could hunt alligators and pick mayhaws in our swamps and bottomlands and, later in the season, hunt woodcocks or observe the endangered red-cockaded woodpecker in mature longleaf pine habitat. These WMAs are readily accessible and very popular with the public, documenting 37,195 user days. Along with public hunting and fishing opportunities, these areas are also utilized for many types of non-consumptive outdoor opportunities such as scouting, boating, camping, hiking, birding and nature photography.

In FY 2021-2022, the most popular activities performed within Pineville region's WMAs in descending order were deer hunting, fishing, squirrel hunting, and waterfowl hunting. White-tailed deer hunting was the most popular activity documenting 9,475 user days and 486 harvested deer. Fishing (recreational and commercial) was the second most popular activity documenting 8,284 user days. Squirrel hunting contributed with 3,792 user days and 7,049 squirrels harvested. Waterfowl hunting followed with 2,536 user days and 3,136 harvested waterfowl.

The most popular non-consumptive activity was sightseeing with 1,750 user days. The next two popular activities were camping, 1,205 user days, and boating, 890 user days.

There are a regulated number of days when WMA users can utilize a primitive or modern firearm for deer hunting. During these dates, 6,027 hunters utilized Pineville region's WMAs and harvested 340 deer. Three of the WMAs (Alexander State Forest, Camp Beauregard, and Dewey Wills) require mandatory deer checks of harvested animals. During these mandatory deer check dates, Pineville regional biologists collected data such as sex, lactation rate, body weight, antler measurements, and chronic wasting disease samples. Any diseased or abnormal physiological characteristics observed during these checks are evaluated and, when necessary, are submitted to Southeastern Cooperative Wildlife Disease Study for testing and diagnosis. All of this information is utilized to track and evaluate deer herd health, population structure, and breeding success.

Alexander State Forest WMA has four permanent physically challenged hunting stands for wheelchair-bound, visually impaired, and amputee hunters. These hunters are given the opportunity to hunt multiple weekends from permanent LDWF ground blinds that are positioned in a restricted area containing food plots. Four weekend lottery youth deer hunts occur on Dewey Wills WMA. This hunt is very popular and many youths enjoy the opportunity to harvest their first deer. LDWF staff provide overnight bunking, permanent deer stands overlooking food plots, game retrieval, and assistance with deer processing.

While a few of the WMAs in the Pineville region are owned by LDWF, some of the WMAs are leased to LDWF for public use from private landowners (Hancock Timber, Roy O. Martin, Louisiana National Guard, Louisiana Department of Agriculture and Forestry, USACE and LaSalle Parish School Board). Landowners do not receive direct payments for the leases. Instead the owners are compensated through a combination of tax exemptions, road maintenance, mowing, prescribed burning contracts, reduced theft and vandalism (due to regular presence of LDWF staff), as well as public goodwill. To continue these lease areas, LDWF personnel are required to negotiate and meet annual agreements with the landowners. The leases help the landowners and LDWF to properly manage and maintain these properties for wildlife and public recreation.

LDWF staff burned approximately 100 forested acres and created or reconditioned 1.25 miles of firebreaks on Little River WMA. These burning operations improved upland habitat for a variety of wildlife species including songbirds, turkey, deer, red-cockaded woodpeckers and small mammals. The burns help to reduce high density sweetgums and French mulberries that were dominating the understory and reducing plant diversity. Presently, after many planned fire rotations, we are seeing an increase in native bunchgrasses, wildflowers and forb abundance, and wildlife usage.

Biological and habitat management work done on the WMAs include dove trapping and banding, wood duck box monitoring and maintenance, wood duck trapping and banding, road side and timber openings mowing, timber health checks, prescribed burning, green tree impoundment flooding, moist soil unit manipulation and flooding, feral hog trapping and removal, wildlife disease sampling, food plot planting, timber thinning stand improvement and invasive species control.

Private Lands Program

Wildlife biologists in the Pineville region diligently collected over 120 samples from white-tailed deer to be tested for chronic wasting disease. Chronic wasting disease was not detected in any of the samples. In addition to these samples, numerous other wildlife species were submitted because of unusual behaviors or poor body condition. All diagnosis were reported to Rusty Berry, state veterinarian, for evaluation. This is yet another way our agency is on the front lines when it comes to wild animal and human health disease concerns and interactions.

Pineville regional biologists participated in a wide variety of other Wildlife Division activities. These include habitat assessments, public presentations, technical assistance, species research, Wetland Reserve Easement monitoring, species banding and monitoring, and habitat management. LDWF personnel were also actively involved in disease monitoring, managed and lottery deer hunts, waterfowl bag checks, black bear population research, nuisance animal response, and alligator licenses and tag management.

Private lands biologists provided general and technical assistance to 1,342 citizens within the region. These outreaches contributed to the improvement of over 4,500 privately owned acres.

MONROE

Wildlife Management Areas (*Total Acres - 138,558 acres*)

- Bayou Macon
- Ben Lilly
- Big Colewa Bayou
- Big Lake
- Boeuf
- Buckhorn
- Bussey Brake
- Floy Ward McElroy
- Russell Sage
- J.C. Sonny Gilbert

The primary habitat type found on Monroe Region WMAs is the Mississippi River Alluvial Valley bottomland hardwood forest, with the exception of J.C. Sonny Gilbert, which provides a unique mixed pine upland hardwoods habitat on the fringe of the Mississippi Alluvial Valley. Several of the WMAs feature reclaimed agricultural lands, which have been reforested with bottomland hardwood forest species. Moist soil management units and green-tree reservoirs are managed to provide habitat for waterfowl and other wetland birds.

Monroe WMA biologists and technicians conducted a wide range of activities including research and surveys involving species, mourning doves, wood ducks, wild turkey, shorebirds and white-tailed deer. These included collecting harvest records of white-tailed deer through managed WMA bag checks, disease investigation such as chronic wasting disease and avian influenza testing, as well as habitat evaluations through vegetation surveys and timber cruising. Biologists and area personnel assisted the large carnivore program with bear management activities, including trapping/collaring, den visits, and handled numerous nuisance complaints. Additional effort was expended conducting public meetings, interacting with various constituents to collect concerns and interests about our management activities.

Fishing piers and boat launch at Bussey Brake WMA.

Litter cleanup on Russell Sage (left) and Boeuf (right) WMAs.

Biologists and technicians maintain and monitor over 175 wood duck boxes, conduct pre-season wood duck banding, and collect samples for avian influenza and other disease testing. Biologists participated in LDWF's woodcock monitoring efforts where they were able to capture, band, and attach GPS backpack units to birds during their winter migration. They also assisted with numerous nuisance animal complaints, illegal captive deer and sick deer complaints.

White-tailed deer is the most popular game animal hunted on the Monroe WMAs; 17,046 deer hunter user-days were recorded harvesting 1,351 total deer in the Monroe Region. Wild turkey hunts were held on four WMAs, where 472 hunter user-days yielded a total of 31 turkeys being harvested. Squirrel and rabbit hunting is also very popular on the ecoregion's bottomland hardwood WMAs, accounting for over 4,411 user days. Waterfowl hunting is very popular as well on Monroe WMAs in moist soil impoundments, green-tree reservoirs, swamps and flooded bottoms. Waterfowl user days were below average, totaling 3,353 attempts, due to lack of rainfall within the region during this period.

Alligator harvest applications were accepted, and licenses and tags were issued to 109 WMA lottery hunters who received 327 tags. This lottery hunt is done through an application process, with each hunter selected receiving three tags. This gives the public an opportunity to participate in the alligator harvest program.

Routine maintenance activities on Monroe region areas included road grading, culvert replacement, road and trail repairs, drainage improvements, beaver control, boundary work, sign replacement, self-clearing station maintenance, vegetation control, equipment maintenance, and facility upkeep. Repairs on all WMA roads and trails were made as funding allocations allowed.

Major projects being initiated or completed include:

- WRP SWA improvements which included the replacement of structures, levee repair, and restoring optimum grade and elevations of these units.

Private Lands Program

During FY 2021-2022, Private Lands Program biologists conducted 16 site visits. They fielded 1,696 requests for information from the public. Under an agreement with NRCS, Private Lands Program biologists conducted 202 inspections of Wetland Reserve Easement properties to assess conditions and make recommendations for management.

Private Lands Program biologists are also responsible for carrying out activities such as migratory and resident bird surveys and banding, collection of biological data for research, habitat evaluations, disease investigations including over 700 chronic wasting disease samples throughout the region, nuisance animal response, and administration of the alligator program to 149 license holders, delivery of deer management assistance to 180 DMAP cooperators, biologists and area personnel assisted the large carnivore program with bear management activities, including trapping/collaring of 12 bears, nine den visits, responding to roughly 60 nuisance complaints, as well as over 150 black bear education and outreach contacts. Regional private land biologists are able to use outreach workshops and media outlets to spread information on wildlife and its habitat to the public.

MINDEN

Wildlife Management Areas (*Total Acres - 45,624 acres*)

- Bayou Pierre
- Bodcau
- Loggy Bayou
- Soda Lake

Minden Office personnel are responsible for administering all wildlife division activities in northwest Louisiana. The following parishes are covered: Bossier, Bienville, Caddo, Claiborne, DeSoto, Jackson, Lincoln, Red River and Webster. Historically the area's predominant habitat type was shortleaf pine-hickory with large areas of bottomland hardwoods along major drainages. Over the last 75 years, there have been major changes in land use in upland areas. Shortleaf pine - hickory habitat has been almost completely replaced by commercial loblolly pine stands with some areas retaining hardwood components in streamside zones. Improved pastures have replaced scattered areas of cropland. As a result, there is currently much less habitat diversity in the current landscape. Acreages that were once longleaf pine have experienced a similar conversion to commercial pine stands. Large tracts of bottomland hardwoods originally found throughout the Red River drainage are non-existent, having been converted to agricultural use over the last 200 years. Scattered remnant stands of hardwood are still found in small acreages mostly in very low-lying terrain. The Red River provides primary drainage for the area with the Sabine River draining the western most portion of the region. Numerous bayous and lakes are located throughout northwest Louisiana, which provide additional habitat to a variety of wildlife species. Biologists and technicians assigned to the Minden office are assigned to either the WMA or Private Lands sections. However, they all work on a regular basis in cooperation on projects within both sections.

Habitat on the WMAs includes bottomland hardwoods, upland hardwood bottoms, pine plantations, natural pine stands, and mixed pine-hardwoods.

A total of 34,212 user days were estimated for Minden WMAs during FY 2021-2022. These areas are readily accessible and very popular with the public. Along with public hunting and fishing opportunities, these areas provide many types of non-consumptive outdoor activities. Managed deer hunts conducted on Bodcau and Loggy Bayou WMAs collected accurate information on herd health and hunter success rates. Collectively, managed deer hunts on Minden WMAs resulted in 512 hunter efforts accounting for 118 deer harvested.

Litter cleanup on Loggy Bayou WMA.

Prescribed burning on Bodcau WMA.

Checking wood duck nest boxes on Soda Lake WMA.

Wood duck nestlings.

Most of the Minden WMA acreage is owned by other governmental agencies. LDWF is the sole owner of Bayou Pierre WMA and owns 65% of Loggy Bayou WMA. USACE, Red River Waterway Commission and Caddo Parish Levee Board all provide acreage to the Minden WMA program. At present, landowners do not receive direct payments for the leases, but instead are compensated through a combination of road maintenance, mowing, prescribed burning projects, reduced theft and vandalism (due to regular presence of LDWF staff), as well as public goodwill. To continue these lease areas, LDWF personnel are required to meet with and negotiate lease agreements with the landowners. The leases help the landowners and LDWF to properly manage and maintain these properties for wildlife and public recreation.

Prescribed burns conducted on Bodcau WMA improved upland habitat for a variety of wildlife species including songbirds, turkey, deer, reptiles, amphibians and small mammals. Routine trapping and banding of wood ducks and woodcock were conducted on WMAs. Dove fields were planted and maintained on Bayou Pierre, Bodcau, Loggy Bayou and Soda Lake WMAs. All Minden WMAs have at least one waterfowl impoundment with a total of seven actively managed. Management activities include regulation of water levels, control of nuisance vegetation, mowing and disking to promote desirable vegetation, maintaining nest boxes, and monitoring of waterfowl activity.

Feral hog control operations continued by shooting and trapping on all WMAs, and contract aerial shooting on Bayou Pierre WMA. Trapping activities resulted in the removal of 125 hogs. An additional 73 feral hogs were killed on/or immediately adjacent to Bayou Pierre WMA by the USDA - Animal and Plant Health Inspection Service aerial shooting. Nuisance animal control activities also included the removal of beavers and coyotes.

Minden WMA personnel participated in a variety of Wildlife Division activities. These include environmental assessments, technical assistance, research, planning, development, management, and alligator and nuisance animal programs. Forty-seven wood duck nesting boxes were maintained and monitored by Minden WMA personnel.

Personnel also reviewed and monitored oil and gas production activities and pipeline maintenance activities on Minden WMAs.

Private Lands Program

The Private Lands Program assists landowners, land managers, hunting clubs and others who desire to improve habitat and/or manage wildlife on their property. Assistance can vary from answering simple questions to a comprehensive written management plan. Assistance is not only available for traditional game species such as deer, ducks and turkey, but includes all wildlife and their habitats.

Many landowners are already working with a natural resource professional, such as a consulting forester, or are enrolled in state or federal programs such as DMAP, Forest Stewardship, and/or NRCS programs such as the Wetland Reserve Easements, Conservation Reserve Program or Environmental Quality Incentives Program. Minden Private Lands biologists cooperate with other natural resource professionals to achieve the landowner's objectives. Most importantly, landowners are encouraged to develop a cooperative relationship with LDWF Private Lands biologists and other natural resource professionals. Wildlife habitat is dynamic, and with the assistance of knowledgeable wildlife professionals, landowners can provide productive habitat for wildlife while meeting other goals they may have, such as income generation and optimizing recreational opportunity.

During FY 2021-2022, Minden Private Lands biologists conducted 40 site visits. They fielded 1,489 requests for information from the public. Under an agreement with NRCS, Private Lands biologists conducted six inspections of Wetland Reserve Easement properties to assess conditions and make recommendations for management. Minden biologists and technicians monitored and maintained 52 wood duck boxes on USFS property.

Minden Private Lands biologists are also responsible for carrying out activities such as migratory and resident bird surveys and banding, collection of biological data for research, habitat evaluations, disease investigations, nuisance animal response, and administration of the alligator program to 234 license holders, delivery of the DMAP program to 71 cooperators, and public outreach via workshops and media outlets.

FARM BILL/GRANTS PROGRAM

FARM BILL

The Farm Bill Program provides support for many species management programs and the Private Lands Program within LDWF. A primary function of the program is to provide input on conservation and other programs contained within the Farm Bill at the national, state and local levels to enhance wildlife habitat. During FY 2021-2022, the program provided direct input on many conservation programs, such as the Agricultural Conservation Easement Program, Conservation Reserve Program, Environmental Quality Incentives Program, Regional Conservation Partnership Program, Conservation Stewardship Program, and Working Lands for Wildlife Program that were included in the Agricultural Improvement Act of 2018. In addition, the program provided training for Private Lands Program staff and developed recommendations on individual properties to facilitate enrollment into Farm Bill conservation programs. The Farm Bill Program continued implementation of agreements with the NRCS to provide technical assistance and restoration activities for the Wetland Reserve Program and Agricultural Conservation Easement Program. This agreement provides funding to develop wildlife habitat management recommendations in response to Compatible Use Authorization requests on Wetland Reserve Program/Agricultural Conservation Easement Program easements in Louisiana, which currently total over 300,000 acres. The program also implemented habitat enhancements on several of those properties through our Wetland Reserve Easement Restoration Agreement. Over 40 projects are at some level of development to deliver timber stand improvements and enhancements to shallow water habitat for migratory birds. Additional accomplishments in FY 2021-2022 included continued implementation of the Working Lands for Wildlife Program that directly benefits the threatened Louisiana pine snake, the endangered gopher tortoise, and a suite of Louisiana shorebirds that utilize agricultural lands statewide. The agency, along with partners, moved the shorebird component of the program toward implementation by incentivizing agricultural producers hold water or extend flooded conditions on various agricultural landscapes in the Mississippi Valley and coastal zone. This provided valuable shallow water habitat in late summer and early fall, when water is typically scarce across our state. The Conservation Stewardship Program rewards the good stewardship of private landowners while compensating them for habitat enhancements that will move them to the next level of conservation on their lands. New projects were initiated for forest landowners to be rewarded for the installation of wildlife habitat enhancements. Staff, along with partners from across the country, provided input at the national level that will impact how the 2018 Farm Bill is delivered nationwide. These activities help ensure that items within that legislation are applicable to cropland, pasture and forestland in Louisiana.

GRANTS

During FY 2021-2022, two State Wildlife Grants were administered under this program with assistance from the Private Lands Program. Both the East Gulf Coastal Plain and West Gulf Coastal Plain Prescribed Burn Initiatives provided funding to enhance wildlife habitat on privately-owned forestlands in Louisiana. 507 acres were identified and ranked for prescribed fire implementation, however high winds and low humidity prevented contractors from mobilizing. Twenty-one acres of mechanical timber stand improvement was implemented in the western part of the state to facilitate safer use of prescribed fire on a much larger tract. LDWF staff continued to work with the Louisiana Wildlife and Fisheries Foundation to deliver funding to update and revise the document that guides how bottomland hardwood forests are managed in the Mississippi Alluvial Valley. This effort will facilitate training private landowners, as well as professionals, to actively manage these forests while providing desired habitat conditions for multiple species of at risk wildlife.

ROCKEFELLER WILDLIFE REFUGE

Rockefeller Wildlife Refuge (RWR), located in coastal Cameron and Vermilion parishes, was created in 1920 through a land donation developed by E.A. McIlhenny. He later persuaded the Rockefeller Foundation to deed the land to the State of Louisiana. Along with serving as a refuge for wildlife and fisheries species, RWR is also considered an "outdoor laboratory," with the property serving as a site for marsh-related research pursued by RWR staff, collaborators and governmental and academic researchers. RWR staff also provides professional expertise regarding the sustainable use of alligators, management of coastal wetlands and other important wildlife and fisheries resources. Further, management expertise, technical assistance and guidance is provided by RWR staff to local landowners for the wise use of their marshland. Lastly, RWR serves as a recreational outlet for the local populace, as well as a destination for regional tourists.

Based on the original deed of donation, the primary goal of RWR is to provide a refuge and preserve for all wildlife and fisheries species. Therefore, management activities are used to promote appropriate habitat and conditions for waterfowl species (the original intent of E.A. McIlhenny for the property), establish/ maintain historic flora and fauna of RWR, and maintain the hydrology of the Mermentau River Basin. In many cases, refuge management activities positively benefit other marsh inhabitants including shorebirds, wading birds, alligators, furbearers and estuarine organisms (i.e., fish, shrimp and crabs).

Another main goal is to study wildlife, fisheries and wetlands in order to address pertinent ecological research questions and to disseminate findings to local, state, national and international audiences. Since 1955, RWR staff has published 350+ peer-reviewed manuscripts, while also preparing technical reports and contributed papers to professional conferences. Secondary goals include providing technical assistance and public outreach and providing a popular destination for recreational activity, primarily through the use of abundant fisheries resources (i.e., fishing, shrimping, crabbing) and the diversity of watchable wildlife (i.e., birdwatching); it should be noted that these two activities never supersede the main goals of RWR.

CONSTRUCTION/ REPAIRS

RWR personnel and administrators continue to work with Louisiana Facility Planning and Control on projects exceeding $250,000. Construction continues on the Phase III Levee Repair project from Hurricane Rita (2005) in FY 2021-2022. Facility Planning and Control awarded the project to Patriot Construction for $3,179,999. This project consists of approximately 21 miles of levee to be rebuilt to an elevation of 9.5 feet. RWR's maintenance and construction staff continue to maintain other levees for the protection and management of critical habitat for wildlife and fisheries. This annual practice maintains the refuge's levee system comprised of over 200 miles. The project is aimed to be complete in FY 2022-2023.

The partnership with Ducks Unlimited continued in FY 2021-2022 with the Unit 10 pump and two water control structures funded by a North American Wetlands Conservation Act grant for the Whooping Crane Habitat Enhancement Project, directly responsible for the enhancement of critical marsh habitat encompassing 445 acres. The water control structures and pump were successfully installed and the project completed in the beginning of FY 2021-2022.

In FY 2018-2019 funding became available from Natural Resource Damage Funds through CPRA to construct additional fishing piers and to install educational signs about the RWR in the amount of $690,000. The project was successfully completed in FY 2019-2020 and refuge staff continued to monitor recreational usage of the piers throughout FY 2021-2022. Over 75 navigational and educational signs were installed throughout the refuge as well as four new fishing piers constructed in three locations. The signs and new fishing piers aid in providing a safe and enhanced recreational opportunity for the public. Refuge staff continues to assess and replace damaged signs throughout the refuge with hopes to have all navigational signs completely restored in FY 2022-2023.

RWR is working in conjunction with other state and federal agencies, as well as adjacent landowners on a marsh creation project known as ME-20. This project is valued at $22,623,346 and consists of building marsh in exposed open water areas on the property next to the refuge, as well as the filling of borrow pits located on the refuge. The borrow pits run approximately 1,500 yards north from the shoreline to sensitive areas both on the refuge and within the neighboring property. The infrastructure was depredated by Hurricane Laura which opened up two channels allowing the free-flow of water from the Gulf into the refuge and neighboring property. The project will restore 414 acres of critical marsh habitat. Construction began in FY 2021-2022 and is scheduled to be completed in FY 2022-2023.

On Aug. 27, 2020, major Hurricane Laura made landfall as a Category 4 storm approximately 20 miles to the west of RWR. The eastern eyewall greatly affected the 70,000-acre refuge, bringing damaging winds and significant storm surge. Most water control structures on the refuge were badly damaged, and many levees were overtopped and blown out by the 12-foot surge. Facilities throughout the refuge sustained major damages from both water and the 150+ mph winds. All ground level facilities had metal siding damage, with most siding being completely ripped off at 10 to 12 feet. The surge inundated the Mechanic Shop, Lumber Shed, Airboat Shed, and Equipment Shed. The Main Office and General Quarters had a tremendous amount of rainfall come into each building, damaging the interior of both facilities. The storm surge pushed the flooring up throughout the southern portion of General Quarters. The West End Dorms had major roof damage as well as flooring/sheet rock damage from wind driven water throughout the southern portion of the building. The storm surge damaged the ground level rooms and elevator at the West End Dormitory. The four residential homes all had roof damage, stairways destroyed, and ground level rooms completely exhausted from wind and surge. Facility Planning and Control awarded a contract for $2,199,000 to Moore Industries for the repair of the Mechanic Shop, Lumber Shed, Airboat Shed, Residences 1, 2, 3 & 4, Research Laboratory and the Equipment Shed. Many facilities were successfully repaired in FY 2021-2022 and it is anticipated that all facility repairs will be completed in FY 2022-2023.

Over 85 miles of levees were impacted from the storm surge within RWR. Approximately 27 miles of these damaged levees protect the Mermentau River Basin from saltwater intru-

The boathouse/shop at Rockefeller Wildlife Refuge showing before (above) and after (below) repairs were made from damage caused by Hurricane Laura.

sion, making this section of levee critical in maintaining the native flora and fauna. In 2018, the protection levee was reconstructed to a finished elevation of 9.5 feet above sea level in response to damages from Hurricane Rita. There are several locations within this critical section of levee that were eroded to marsh level as a result of Hurricane Laura. Facility Planning and Control received $29 million of surplus to begin the repair work needed and will be reimbursed by FEMA once invoices are submitted; surveys have been conducted and are awaiting review. Five of seven surface pump units have been successfully repaired or replaced, all 22 miles of roads repaired, and the refuge fleet of outboards, surface drives, and airboats is almost completely restored.

After Hurricane Audrey in 1956, RWR constructed and completed the present office in 1959. In FY 2018-2019 a contract was awarded by Facility Planning and Control to Angelle Architects to design a new office complex. The current design plans are to construct the new office just west of the present office. Contractors broke ground on the new office beginning construction in FY 2021-2022; test pilings were installed and monitored. It is anticipated for construction progress to continue in FY 2022-2023 pending the results of the test pilings. Refuge staff continues working out of the Research Laboratory until the new office is complete.

MINERAL MANAGEMENT

The only active oil production taking place on the refuge is Hilcorp Oil Company. The program manager and staff continues to work with Hilcorp regarding maintenance and safe operations on RWR.

MARSH, WILDLIFE AND FISHERIES MANAGEMENT

MARSH MANAGEMENT

RWR staff maintains over 200 miles of levees and 55 water control structures for the conservation of approximately 71,000 wetland acres on RWR and 100,000 private sector acres within the Mermentau River Basin. Maintenance and manipulation of RWR's system of levees and water control structures vary somewhat by management unit, but general goals are to maintain marsh health, provide conditions favorable for waterfowl forage, and incorporate multi-species management when possible. Biological staff uses the approved RWR management plan, which acts as a tool to guide research and management on the property.

Habitat conditions have become more stable over time, with many water control structures replaced for the management of water levels throughout RWR. Furthermore, staff have also worked on wetland permit applications with USACE and the LDNR - Coastal Management Division for levee restoration and maintenance. Hydrologic restoration and unit management have improved as a result of maintenance. In addition to water control, staff normally will perform vegetation control with herbicides via airboat as well as contracting out aerial applications. Approximately 25 acres of invasive and undesirable vegetation were treated in FY 2021-2022.

Marsh fires during certain times of the year decrease fuel loads of marsh vegetation, prevent catastrophic fires when the marsh is excessively dry during the summer, and provide new stem growth for migratory waterfowl species. Generally, one-third of the refuge is burned on a yearly basis. During FY 2021-2022, approximately 6,325 acres were prescribed burned.

Refuge staff continued monitoring giant salvinia and feral hogs. Salvinia is an invasive aquatic with a rapid growth rate that can cause many habitat management problems such as dissolved oxygen issues and outcompeting native vegetation, which affects native fauna. Normally, salvinia is managed on the refuge via the use of higher levels of salinity that are introduced by opening the East End Locks and by cooperatively working with the LSU AgCenter with the weevil eradi-


***LEFT:** A prescribed burn conducted in Unit 6 of Rockefeller Wildlife Refuge. **RIGHT:** LDWF staff planting smooth cord grass along the shoreline of Rockefeller Wildlife Refuge.*

cation control project. In FY 2021-2022 no weevils were introduced to the refuge, however refuge staff did actively manage saltwater introduction into areas experiencing an abundance of giant salvinia.

RWR worked in collaboration with the Gulf Coast Soil & Water Conservation District to establish native coastal wetland vegetation along the shoreline. Approximately 6,000 individual plants of five species were planted, totaling approximately 20,000 linear feet along RWR's beaches.

INUNDATION RELIEF PROJECT

RWR is located within the sub-basin of the Mermentau Basin, which includes over 700,000 acres and historically existed as a watershed during high rainfall events. LA Hwy 82, which was constructed in the 1950s, restricts drainage of local communities and marshes north of the highway to outlets located on RWR. That restriction can result in prolonged periods of inundation during high rainfalls and flooding events. A modified system including the East End Lock system along with additional structures will aid with the increase volume flow to the eight outlets at the Gulf of Mexico. This will prevent prolonged periods of ponding and negative impacts to thousands of acres of wetlands.

The goals of this project are to reduce prolonged periods of inundation to relieve flooding stress and restore the function, value, and sustainability to thousands of acres of marsh. The proposed project will also allow RWR to accommodate additional water flow during flooding events to relieve flooding of local communities. The project will create marsh and divert water into marsh areas that will benefit from the freshwater, nutrients and sediment.

The proposed project would construct additional drain structures that would allow for an increase in the flow of water from the upper basin. The current lock system is over 40 years old, is in desperate need of repair, and cannot adequately relieve flooding in much of the Mermentau Basin. In addition to the locks and outflow structures, modifications at Hwy. 82 with cleaning of drainage laterals and connecting flow through outlets to main canals will enhance the project by creating/nourishing 105 acres of marsh. Reduced inundation of marsh is predicted to increase marsh production over the 35,000 acres. The project was funded in FY 2020-2021 from the Louisiana Office of Community Development, and in FY 2021-2022, an Environmental Review Record was completed and project designs are under way. Construction is anticipated to begin in FY 2023-2024 with a construction budget of approximately $20 million.

MARSH CREATION AND HABITAT ENHANCEMENT WITH BENEFICIAL USE OF DREDGE MATERIAL

LDWF entered into an agreement with USACE and other regulatory agencies to construct the Rockefeller Mitigation Bank to offset wetland losses caused by adverse impacts in Louisiana's Coastal Zone. The major objective of the mitigation bank is to compensate for impacts occurring on RWR or for impacts outside the refuge (provided there are no available approved mitigation projects).

LDWF originally permitted three areas on RWR as potential wetland mitigation sites in the year 2000 (totaling 177.7 acres). Staff continues to monitor these sites annually, with very successful grass plantings observed at the 4.7- and 66-acre sites. Consequently, these marsh creation projects have attracted fisheries species, a diversity of birds, and even muskrats.

A release of credits has been issued with the acceptance acres within the 4.7- and 66-acre sites. The 107-acre site is in design for additional pumping of spoil in areas that have settled lower than expected since the original construction in 2014. In March 2022, RWR received the final credit release for Site B. The total credits for each site consist of Site A = 2.7 acres, Site B = 92.4 acres, and Site C = 21.2 acres, totaling 116.3 acres. The credits per acre are valued at $80,000. In the past 10 years, 40.5 acres/credits have been sold. There is a focus on new prospects to develop an additional site in the Deep Lake area on RWR.

SHORELINE PROTECTION AND STABILIZATION

The rate of erosion along RWR's 26 miles of shoreline has steadily increased in recent decades with rates of approximately 30-50 feet per year. In an exceptional case, surveys conducted in 2016 indicated the shoreline along the Price Lake Unit eroded 233 feet in nine months.

In FY 2015-2016 RWR was awarded $33 million from the Coastal Wetlands Planning, Protection and Restoration Act. Restoration Act to complete a shoreline protection project along a portion of RWR coastline in the form of segmented breakwaters. The project was designed and awarded to the lowest bidder, Leblanc Marine, in FY 2016-2017. Construction began in August 2018.


***LEFT:** Shorebirds foraging near tidal pools behind rock breakwaters constructed as part of the ME-18 Gulf Shoreline Stabilization Project on Rockefeller Wildlife Refuge. **RIGHT:** Land accretion on the north side of rock breakwaters at Rockefeller Wildlife Refuge. Note the natural accumulation of oysters in the area.*

Another funding source dedicated to shoreline protection along RWR is the CPRA RESTORE Local Match Program funds awarded to the Cameron Parish Police Jury in the amount of $6,671,531. The Cameron Parish Police Jury also used $2 million of Cameron Parish RESTORE funds and $4,270,262.72 from a Community Development Block Grant to add towards the project. Governor John Bel Edwards added surplus funds of an additional $5 million totaling $17,941,793.72 allocated to additional shoreline protection along the coastline of RWR. This portion of construction funds was announced for bids in FY 2019-2020. The project was awarded to Rigid Construction and construction began in December 2020. On April 4, 2020 the Cameron Parish Police Jury issued a Noticed To Proceed to Ridgid Construction for the Shoreline Protection Project, known as ME-37. This section of shoreline protection added 3,414 ft. further west from where the 3.85 mile ME-18 project ended. Funding was provided by the Community Development Block Grant program and state surplus funds. The project was completed on March 4, 2021 at a cost of $7,330,518. The combination of the ME-18 and ME-37 projects total 4.5 miles of shoreline protection along RWR's coast. Approximately $10 million of funding remains to continue the design and construction in FY 2023-2024, and extend this project further west.

WILDLIFE MANAGEMENT

Alligator Nuisance Harvest

An annual nuisance alligator harvest is normally conducted on RWR in the month of September. This harvest is carried out by alligator hunters with a prior trapping history on RWR, and all are approved by LDWF after the successful completion of an enforcement background check. In September 2021, four trappers were issued 100 alligator harvest tags each. Hunting areas were distributed throughout RWR with the intent of taking alligators from areas with high public use, thus reducing the chance of negative interactions between alligators and humans. The experimental nuisance alligator harvest occurred Sept. 1, 2021 and ended Sept. 3, 2021. Hunters harvested 399 alligators of the 400 tags issued for a 99.75% success rate, at a size average of 7.34 feet. Sex ratio data were available for all 399 alligators, of which 75.2% were males and 24.8% were females.

FISHERIES MANAGEMENT

RWR continued an active approach with the operation of water control structures across the refuge to facilitate the ingress and egress of estuarine marine organisms without impacting established habitats on RWR and those of adjacent landowners.

In FY 2021-2022 RWR staff continued the stocking of Florida-strain largemouth bass (*Micropterus salmoides floridanus*) in an ongoing effort to augment the species population within the refuge, as well as improve recreational opportunities for the species. In the spring of 2022, the rearing ponds at RWR were stocked with 152,400 fry. Staff seined the ponds after 36 days, resulting in approximately 54,326 fingerlings (35.7% survival rate).

The Florida-strain largemouth bass fingerlings were released on RWR in June 2022. Normally a portion of the fingerlings are dispersed in other various locations within the state by the LDWF Inland Fisheries Division, but due to a late reproductive season from drought conditions and a lower than expected survival rate, fisheries staff were unable to achieve this initiative. RWR hopes to continue the cooperative effort to assist Inland Fisheries with their target stocking goals in future years.

Largemouth bass fingerlings are being released in Unit 6 at Rockefeller Wildlife Refuge.

WATERFOWL/ MIGRATORY GAME BIRD PROGRAM

In 1994, RWR began a long-term mottled duck (*Anas fulvigula*) banding program to monitor annual survival rates and analyze distribution along the Gulf Coast between Texas and Louisiana. Recent studies and mid-winter aerial survey data indicate the Gulf Coast mottled duck population is experiencing declines. Anthropogenic changes, including loss and degradation of coastal wetlands and adjacent prairies are likely responsible for historical recent declines in mottled duck populations. RWR supports research to help scientists and managers better understand mottled duck ecology and population dynamics. Since 1994, LDWF staff at RWR have banded 49,869 mottled ducks, primarily in the coastal marshes of southwestern Louisiana. The banding effort is now a cooperative endeavor among various state and federal agencies in Texas and Louisiana. In FY 2021-2022, RWR staff banded 1,959 mottled ducks and recaptured an additional 161 mottled ducks.

Winter aerial waterfowl surveys are conducted annually over coastal WMAs and refuges in south Louisiana on a monthly basis from November through January. Transects are flown in each management unit and the unmanaged marsh area, and thereafter, extrapolated to yield an estimate of waterfowl abundance on the area. The waterfowl survey estimate on RWR during 2021-2022 totalled 278,012 ducks:

- 122,518 in November 2021
- 78,971 in December 2021
- 76,523 in January 2022

In FY 2021-2022, RWR staff banded 15 mourning doves. Banding totals continued to decline significantly from previous seasons, most likely in response to black-bellied whistling ducks disturbing baited traps, which discourages doves from using the trapping locations. Concurrently, the impacts of hurricanes Laura and Delta may have played a role in below average dove captures as resident landbird populations in the region were reduced directly by mortality or indirectly through habitat loss (Johnson 2021; Southeastern Naturalist 20:560-571).

WHOOPING CRANES

Although most COVID-19 pandemic restrictions had been lifted, several of the Whooping Crane captive breeding facilities were still operating under constraints that limited their ability to produce and raise chicks for release in 2021. As a result only four juvenile, male whooping cranes were allocated to LDWF for release. The four young birds were received on Nov. 10, 2021 from the Freeport-McMoRan Audubon Species Survival Center in New Orleans, Louisiana. They were transported to the White Lake Wetlands Conservation Area in Vermilion Parish where they were banded and immediately released. One died from predation just days after release, likely due to inappropriate habitat use, but the other three captive-reared chicks remained alive. Additionally, four wild-hatched chicks from 2021 remained alive through the report period.

The maximum size of the Louisiana Non-migratory Population at the end of the report period was 76 individuals (38 males, 29 females, nine unknown) with 74 birds located in Louisiana and two in Texas. Based on location data generated via remote transmitters, cranes were documented in 19 parishes throughout Louisiana, with four of those parishes accounting for 75% of the data points within the state. A male crane who spent much of his time in southeastern Texas and a female crane who seasonally migrated from Oklahoma to Alabama died, so the use of areas outside of Louisiana will likely decrease based on the individuals currently in the Louisiana Non-migratory Population.

During the 2022 breeding season, 17 pairs initiated 27 nests in seven different parishes in Louisiana and one county in southeastern Texas. Fourteen pairs consisted of individuals who had previous experience nesting together, two pairs consisted of individuals who had previous experience with other cranes, and one pair consisted of individuals who were both nesting for the first time. Three pairs that had nested in 2021 did not nest in 2022.

LDWF staff installing leg bands on mottled ducks captured on Rockefeller Wildlife Refuge.

Nineteen nests from 10 pairs were located on private agricultural properties, nearly all of which were actively crawfished, while the remaining eight nests from seven pairs were located in marsh habitats; three pairs nested in the White Lake Wetlands Conservation Area marsh and four nested in marsh habitat on private property. One hatch year 2019 female was translocated from the failed Florida non-migratory population in October 2021. She paired, but did not nest in 2022. So far, translocation of individuals from the Florida flock has been successful with all three individuals pairing and setting up territories, but not yet producing offspring.

In 2022, 15 chicks hatched to 12 pairs (nine pairs hatched one chick; three pairs hatched two chicks). Twelve chicks hatched to their biological parents and three hatched from fertile eggs that were swapped into nests. Seven chicks (from six pairs) survived to fledging, with an eighth chick, from an additional pair, fledging shortly after the end of this report period. Five successful pairs had some prior parenting experience, with three of those pairs having successfully raised chicks to independence in the past. Two successful pairs had no prior parenting experience. The remaining seven chicks disappeared at 3-30 days of age. For the second year in a row and the third time since chicks were first produced in Louisiana, a single pair successfully fledged two chicks. The eight fledged chicks represent a record high for Louisiana as well as a record number of fledged chicks for any previous or current reintroduction project. Additionally, this year, for the first time, chicks fledged from nests located in marsh habitats, including four from the White Lake Wetlands Conservation Area, the first since 1939.

Now in its 12th year, the Louisiana Whooping Crane Reintroduction Program continues to see positive progress, including a record number of fledged chicks, but still has challenges to overcome before the population can become self-sustaining, one of which is understanding potential causes of embryo mortality to increase natural productivity.

WILDLIFE AND FISHERIES RESEARCH

RWR places high priority on wildlife, fisheries and marsh management research. Throughout the year, staff biologists conducted independent and collaborative research, while also presenting research findings at regional, national, and international meetings. Several notes or manuscripts describing research results or observations were also accepted for publication in peer-reviewed journals.

Outside researchers made multiple research requests and all were approved to use RWR as a study site. Projects included:

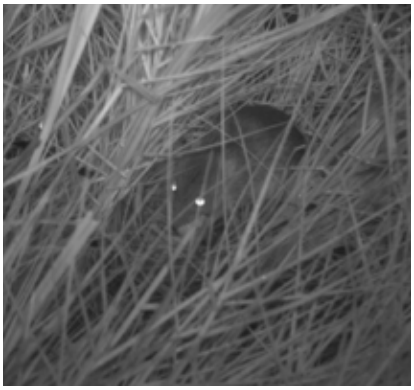
- phragmites management (LSU).
- monitoring nesting productivity of beach nesting birds (Audubon Louisiana).
- monitoring of movement patterns and seasonal migrations of finfish (LSU).
- evaluating the mottled duck nest predator community in southwestern Louisiana using artificial nests.
- identifying night roosts of Whimbrel throughout the flyway to be used as an index site for monitoring population trends (Manomet).
- testing the capabilities of thermal drone imagery to identify Whimbrel night roosts.

STAFF RESEARCH AT RWR

Assessing Seaside Sparrow Abundance, Distribution, Annual Survivorship and Nesting Productivity in Southwestern Louisiana

Field research was conducted by staff during the 2022 breeding season marking the third consecutive year of data collection on seaside sparrow productivity. A total of 90 nests by 49 pairs were found in 2022, of which 21 nests (23.3%) successfully fledged at least one young (~2.6 fledglings/nest on average). Overall, 301 seaside sparrow nests were found during the course of this study. Of the nests where the outcome or fate could be determined (n = 264), 52 nests (19.7%) successfully fledged young. Data will be analyzed to determine daily survival rates and other critical factors that may influence nest success.

Predation has been the most likely cause of nest failure in all years accounting for approximately 80% of failures. Other known causes of failure included flooding (~5%) and wildfire (~3%). In 2022, staff deployed trail cameras at artificial nests (n = 32) positioned near study plots to document potential nest predators. Marsh rice rats were detected by trail cameras in all instances (n = 11) where a predator was known to have depredated eggs. Red-winged blackbirds and other Icterids are known nest predators, and while staff could not conclusively determine nest predation by birds, they were likely responsible for some failed nests particularly in the first year when grackles were abundant at recently burned study plots and nest failure was high. Other potential seaside sparrow nest predators observed on the refuge include mink, raccoons and snakes.



***ABOVE:** A male seaside sparrow singing on its territory at Rockefeller Wildlife Refuge.*
***BELOW:** A marsh rice rat consuming an egg at an artificial nest placed near a seaside sparrow study plot on Rockefeller Wildlife Refuge.*

From 2020-2022 vegetation structure and composition measurements were collected at nest sites (n = 275) and random points (n = 195). These data will be analyzed to characterize the nesting habitat of seaside sparrows at RWR as well as nest-site selection variables. In addition, 251 individuals were color-banded during this study to facilitate identification of nesting pairs and territories. Staff collected at least 10 different territory points (mean = 15.3) for 34 color-banded males, which will be used to calculate average territory size and develop estimates of breeding density.

Winter Shorebird Response to a Coastal Shoreline Protection Project

Research staff conducted ground surveys along a 3-mile stretch of shoreline on RWR during winter months from 2017-2022. The main objective of the study was to monitor the response of shorebirds to a coastal protection project before, during, and after the construc-

tion of rock breakwaters. The ME-18 Gulf Shoreline Stabilization Project was designed to reduce shoreline retreat and promote natural vegetative colonization of overwash material landward of the structure. Beginning in 2018, lightweight aggregate core breakwaters were constructed west of the mouth of Joseph Harbor along the Gulf shoreline.

Several focal species of shorebirds and wading birds were documented utilizing habitats along the shoreline including two federally-threatened species - piping plover and red knot. Other focal species included snowy plover, Wilson's plover, long-billed curlew, American oystercatcher and reddish egret. All of these species except for reddish egret were observed during surveys. Time-activity budgets, which can provide valuable insights into animal behavior relative to spatial and temporal habitat use, were primarily conducted on piping plover and long-billed curlew. Future analyses will examine how much time these species spent foraging, resting, alert, etc. to determine if rates varied based on the construction phase or other abiotic and biotic factors.

Preliminary data from 59 surveys over five years indicate 478.6 birds from 19.2 species were observed per 3-mile survey, on average. The number of birds detected per survey ranged from 15 to 1,054 individuals and the number of species detected ranged from five to 32. Twelve species were considered relatively common based on the occurrence of >4.9 individuals per mile. These were: American white pelican, black-bellied plover, brown pelican, dunlin, Forster's tern, laughing gull, royal tern, ruddy turnstone, sanderling, short-billed dowitcher, semipalmated plover and western sandpiper. The remaining species observed were categorized as uncommon (1.0 – 4.9 individuals/mile; n = 11 species) or rare (<1.0 individual/mile; n = 27 species). Although shorebirds were the primary focus of this study, staff noted numerous waterfowl species loafing along the shoreline or foraging in coastal shallows created after the breakwaters were constructed. These species' occurrences were categorized as uncommon (gadwall, green-winged teal, lesser scaup) or rare (blue-winged teal, canvasback, mottled duck, northern pintail, northern shoveler, red-breasted merganser, snow goose, surf scoter).

Field surveys were concluded in 2022 and staff have been compiling data which will be analyzed in the future. Publications resulting from this research will be made available in the public domain. This project was funded through RWR.

Nesting Ecology and Habitat Use of Reddish Egrets

A research project focused on the distribution, abundance, and nesting ecology of reddish egrets in coastal Louisiana was initiated in the spring of 2016. As part of this research, a total of 25 adults were fitted with satellite transmitters in order to better understand their movements, habitat use, and survival. The field component of this project was concluded in 2018 but telemetry data from active satellite transmitters on six birds are still being collected remotely and archived by staff to document any novel foraging sites and breeding locations in Louisiana. These data can be used to update element occurrence records for this species maintained by the Wildlife Diversity Program. In addition, telemetry data have been used to evaluate the response of reddish egrets, a species restricted to coastal habitats, to numerous tropical cyclones that impacted the state from 2016-2021 to determine how these storms directly affected local reddish egret populations. A manuscript on this topic has been submitted to a journal for peer review and will be made available in the public domain.

Evaluating the Mottled Duck Nest Predator Community in Southwest Louisiana Using Artificial Nests and Trail Cameras

LSU graduate student A. Dopkin and RWR researchers completed the second and final field season of an artificial nest study to evaluate the predator communities and relative mottled duck nest survival rates in important mottled duck nesting habitats. In 2022, researchers deployed 29 10-ha replicates in four habitat types: upland, cordgrass, cutgrass and terrace. Ten artificial nests closely simulating real mottled duck nests were constructed in each replicate (n = 290) with trail cameras monitoring half of the nests to assess fates and identify important nest predator species. Camera grids were also deployed on a subset of replicates to characterize the predator community and model species distributions.

Between 2021 and 2022, a total of 49 study sites and 490 nests were deployed in southwestern Louisiana. Trail cameras collected over 6.3 million photographs. A. Dopkin is currently working with a team of LSU undergraduate workers to sort through the database and identify predator species. Thus far, the same predators have been documented depredating nests in both season: coyotes (*Canis latrans*), raccoons (*Procyon lotor*), Virginia opossums (*Didelphis virginiana*), American mink (*Neovison vison*), American crow (*Corvus brachyrhynchos*), king rail

***LEFT:** A trail camera captured an American alligator completely depredating an artificial nest.* ***RIGHT:** A clapper rail is in the process of depredating an artificial nest.*

(*Rallus elegans*), clapper rail (*Rallus crepitans*), purple gallinule (*Porphyrio martinica*), western rat snake (*Pantherophis obsoletus*), and American alligator (*Alligator mississippiensis*). This list may not be comprehensive as camera footage is still being reviewed. Data entry for 2022 is ongoing, but a GLM shows there is no significant difference in apparent survival rates between habitat types in 2022.

COLLABORATIVE RESEARCH AT ROCKEFELLER WILDLIFE REFUGE

During FY 2020-2021, RWR biologists collaborated on a number of marsh management, wildlife and fisheries research projects on the refuge, across the region and state, and beyond. These projects include:

- **Monitoring movement patterns and seasonal migrations of finfish in Rockefeller Wildlife Refuge.** J. Marty, R. Temple, P. Trosclair, L. Ardoin, with M. Dance, E. Gutierrez, and G. Fignar
- **Monitoring beach-nesting birds in southwestern Louisiana.** R. Temple with E. Johnson, Audubon Louisiana (funded by American Bird Conservancy and grants awarded to Audubon Louisiana)
- **Managing coastal wetlands for wildlife and suitability in the face of sea level rise.** J. Marty with S. King, and S. Graham, LSU (funded by Rockefeller Operating Funds)
- **The efficacy of marsh terraces in enhancing and restoring gulf coastal wetlands.** J. Marty with B. Davis, and M. McFarland, Mississippi State University; and M. Brasher, Ducks Unlimited, Inc. (funded by Mississippi State University)
- **Understanding mechanisms driving coastal marsh sustainability in the face of sea level rise.** J. Marty with A. Booth, A. Nyman, and S. King, Louisiana State University (funded by Texas Parks and Wildlife and LDWF)
- **Assessing Phragmites australis vulnerability to Sea-level Rise: the Influences of Population and Haplotype.** A. Lynn and T. Quirk, Louisiana State University (funded by Louisiana State University)
- **Evaluating the Mottled Duck Nest Predator Community in Southwestern Louisiana Using Artificial Nests.** K. Ringelman, A. Dopkin. J. Marty, P. Link, R. Temple

PUBLICATIONS BY RWR STAFF BIOLOGISTS

Ringelman, K. M., M. G. Brasher, J. R. Marty, D. A. Butler, S. McDowell and R. Temple. 2022. Evaluation of Light-Logging Geolocators to Study Mottled Duck Nesting Ecology. Journal of Fish and Wildlife Management, X(X):xx–xx; e1944-687X

Vasseur, P. L., S. A. Collins, and W. Selman. Effects of tropical cyclones and other severe weather events on reddish egret populations in Louisiana. Journal of Coastal Research (in review).

Nemes, C. E., P. P. Marra, T. J. Zenzal, S. A. Collins, B. C. Dossman, A. R. Gerson, C. Gomez, A. M. Gonzalez-Prieto, M. G. Ramirez, S. A. Hamer, J. Marty, P. L. Vasseur, and E. B. Cohen. Songbirds in North America catch the green wave without surfing. Journal of Animal Ecology (in review).

Vasseur, P. L., S. L. King, and M. D. Kaller. Diurnal time-activity budget and habitat use of whooping cranes (*Grus americana*) in the reintroduced Louisiana nonmigratory population. Wilson Journal of Ornithology (in press).

Waddle, J. H., L. R. Jones, P. L. Vasseur, and C. W. Jeske. 2022. Estimating detection and occupancy of secretive marsh bird species in low and high saline marshes in southwestern Louisiana using automated recording units. Wetlands 42(4): 1-11.

Collins, S. A., W. Selman, M. C. Green, and W. T. Strong. 2021. Reproductive ecology and nest success of reddish egrets (*Egretta rufescens*) on a natural marsh island in southwestern Louisiana, USA. Waterbirds 44(1): 1-12.

TECHNICAL ASSISTANCE, OUTREACH AND EDUCATION

Understanding the ecology of coastal marshes in southwestern Louisiana is paramount to understanding the vital role that RWR plays in the Chenier Plain. RWR places a high importance on education and outreach, ensuring that educational programs are facilitated at the refuge, and the area itself can be used as the classroom.

In the years prior to COVID-19 & Hurricane Laura, various groups would visit the refuge and receive talks on marsh management, coastal protection and many other educational topics related to wetland ecology. Professional groups that specialize in marsh ecology also utilize RWR for its "outdoor laboratory," and are often visiting from other coastal areas in the United States. The overnight facilities at RWR are used to accommodate these groups and allow them to spend significant time in the field without having to commute to municipalities for housing.

In FY 2021-2022, repairs were still under way at the West End Dorms, preventing the ability to host college student workers, college classes, and other special interest groups. The West End Dorms facility can accommodate most groups with 17 beds, full kitchen, dining space and living quarters. It is anticipated that the West End Dorms repairs will be complete and the facility back in full use in FY 2022-2023.

Examples of technical assistance provided by RWR staff include:

- Completing mourning dove banding for the statewide dove monitoring program.
- Assisting private landowners in assessing marsh conditions and management for waterfowl.
- Conducting peer-review and editorial duties for scientific journals; reviewing graduate student theses and dissertations.
- Participating in guided tours around RWR.
- Presenting lectures to visiting college and university students on wetlands ecology, wetlands management, waterfowl ecology and conservation research.
- Reviewing research and grant proposals for university students and faculty.

RWR staff also participated in guided tours for a number of organizations and groups relating to management and coastal restoration projects.

RECREATIONAL USE

Marsh management units, and more specifically water control structures, continue to be very popular with sport fishermen. All portions of RWR remained open throughout the year from the beginning of March to the end of November. December through February, various areas are restricted to access for wintering migratory bird disturbance avoidance. In FY 2021-2022 RWR saw approximately 138,899 visitors. Staff monitored the usage of the four new fishing piers built at the East End Lock, Unit 4 Concrete Structure, and the Mud Hole Structure. Approximately 48,090 individuals utilized these fishing piers during FY 2021-2022.

WHITE LAKE WETLANDS CONSERVATION AREA

LOCATION

The White Lake Property (as referred to in Act 613, 2004 Louisiana Legislature) or White Lake Wetlands Conservation Area (WLWCA) (as referred to by LDWF) is located in Vermilion Parish. The contiguous unit is 71,905 acres, located along the western boundary of Vermilion Parish; it is bounded on the south by White Lake, and the northern boundary is 7.4 miles south of Gueydan at the south end of Hwy. 91. Lafayette is 32 air miles northeast, and Lake Charles is 40 air miles northwest. The southern boundary of WLWCA is 17.5 miles north of the Gulf of Mexico. The property averages 12 miles from east to west and 9 miles from north to south.

HISTORY OF OWNERSHIP

BP America Production White Lake properties have a long history of company ownership and management. Note that Stanolind Oil and Gas Company (Stanolind) preceded Amoco Production Company (Amoco) which preceded BP America Production Company (BP). Stanolind acquired the 70,965-acre property from Wright Morrow by Act of Sale on July 31, 1935. This sale included all of the property acquired by Yount-Lee Oil Company from P. L. Lawrence, et. ux., by Act of Sale dated March 7, 1931 and a portion of the property acquired by M.F. Yount from Elizabeth M. Watkins by Act of Sale dated Nov. 5, 1929. BP owned and managed the BP American Production White Lake Property until July 8, 2002 when BP donated the property to the state of Louisiana. On July 8, 2002, a Cooperative Endeavor agreement between the state and White Lake Preservation Inc. (a 501(c) 3 corporation) for management of the property was executed. On Jan. 1, 2005, Act 613 of the 2004 Regular Legislative Session became effective. This act established:

- Transfer of property management from White Lake Preservation Inc. to LDWF.
- The White Lake Property Advisory Board, LDWF and the Wildlife and Fisheries Commission powers and duties relative to the management of the White Lake Property.
- A special account within the Conservation Fund for the White Lake Property.

On Dec. 17, 2004, the state, BP and White Lake Preservation Inc. signed a Transition Agreement for the management of the property by White Lake Preservation Inc. until July 1, 2005, at which time LDWF took total control.

A land swap agreement between LDWF and the Vermilion Parish School Board increased the overall acreage of WLWCA from 70,965 to 71,905 acres in 2014.

SURFACE LEASES

AGRICULTURAL AND HUNTING

There are currently 37,841 acres of property leased out in eight separate tracts. The property is leased to eight separate tenants for the purpose of farming, raising cattle, crawfish farming and hunting. There is a rice base totaling 4,587.5 acres on this property. There were approximately 2,000 acres of rice planted in 2022. There were approximately 1,800 acres of crawfish ponds on the property in 2022.

There are over 100 miles of levees, canals and roads on WLWCA agricultural lands that are maintained by our agricultural tenants. They also own and operate the pumping systems that are needed to manage water levels on this impounded agricultural land. All of the farmland on WLWCA was at one time freshwater marsh that was impounded in the late 1940s when agricultural activities first began on the property.

ALLIGATOR TRAPPING AND EGG COLLECTION

There were 343 alligators harvested in the 2021 alligator trapping season. The average length of the alligators trapped was 6.68 feet, with an average live length value of $4.45 per foot.

There was a state bid issued for the collection of alligator eggs from the WLWCA property in 2021. The only bid received and accepted was at a rate of $10 per egg. Only 2,454 eggs out of the 12,000-egg quota were collected. An administrative decision was made which allowed the contractor to pick up fewer eggs than required by contract.

OTHER SURFACE LEASES

There are three oil and gas valve site leases on the property. In addition, there is one oil & gas surface use agreement with an associated road servitude agreement.

LOTTERY ACTIVITIES

FISHING LOTTERY

2021 - One-hundred fishing permits were issued at a cost of $40 per permit. Permittees and their guests were allowed to fish the Florence Canal Area and specified well location canals that flow into the Florence Canal. The area was open from sunrise to sunset from March 15 - Aug. 15, 2021.

2022 - One-hundred fishing permits were issued at a cost of $40 per permit. Permittees and their guests were allowed to fish the Florence Canal Area and specified well location canals that flow into the Florence Canal. The area was open from sunrise to sunset from March 15 - Aug. 15, 2022.

WATERFOWL LOTTERY

Waterfowl Hunting (2021-2022 Season)		
	Total Hunts	Participants
Teal Lottery Hunts	8	76
Marsh Lottery Hunts	30	281
Youth Hunts	2	13
Rice Field Lottery Hunts	30	211

Waterfowl Hunting Results (2021-2022 season)		
	Marsh	Rice Field
Total Ducks Harvested	1,202	305
Average Kill/Hunter (ducks)	4.28	1.45
Total Geese Harvested	83	36
Average Kill/Hunter (geese)	0.3	0.17

NON-CONSUMPTIVE ACTIVITIES

BIRDING TRAIL

The WLWCA birding and nature trail, with accompanying kiosk, was completed in April 2012. The trail is on approximately 30 acres located on the northern boundary of the property where LA-91 ends. Birding paths, a parking area, access bridges, a birding tower and a picnic pavilion are open to the pub-

lic. There were only 19 names logged on the visitor's logbook and 10 self-clearing permits completed for people visiting the trail in FY 2021-2022. The new self-clearing permit requirement on WLWCA did not go into effect until July 1, 2022, so we expect to see more self-clearing permits in future years.

EDUCATION, OUTREACH AND RESEARCH

MARSH MANEUVERS

On Dec. 11, 2021, WLWCA was host to a group of 16 teenage 4-H students. The Marsh Maneuvers camp was designed to educate the students on the importance of coastal erosion, restoration, conservation and ecology. They were also able to go on a morning marsh tour and were taught waterfowl identification techniques. They participated in a sporting clay shoot where they were instructed on gun safety and the proper use of a shotgun.

COASTAL PRAIRIE

There is approximately 200 acres of coastal prairie on the WLWCA property located south of the Gulf Intracoastal Waterway and west of the Florence Canal. For the past couple of years, the LDWF Wildlife Diversity Program has been conducting research on the different plant species located on this prairie. To date, approximately 95 different species have been identified. A coastal prairie enhancement project was completed in 2019 by WLWCA and Wildlife Diversity Program staff that included prescribed fire and herbicide application to reduce woody encroachment. This project was funded through the State Wildlife Grants Program and the White Lake Fund.

WHOOPING CRANE REINTRODUCTION PROGRAM

WLWCA assisted the Whooping Crane Reintroduction Program by providing office space, staff and vessel support. WLWCA staff maintained the 700-acre impoundment water levels around the whooping crane pen and associated release site. WLWCA staff assisted with whooping crane captures and releases as needed.

DUCK & DOVE BANDING PROJECTS

WLWCA continued banding birds to complement various LDWF statewide programs. In the 2021 calendar year, 43 wood ducks were banded and 30 were recorded as recaptures. Twenty black-bellied whistling-ducks were banded and two were recorded as recaptures. In addition, 20 mourning doves were banded and two were recorded as recaptures.

NESTING BOX PROJECTS

WLWCA continued maintaining and monitoring wood duck nesting boxes to complement the LDWF statewide program. In the 2021 nesting season, 111 nesting boxes were monitored and maintained. These boxes produced 61 successful wood duck nests and 636 hatchlings. Black-bellied whistling-ducks used the same nesting boxes to produce six successful nests and 90 hatchlings. In the 2021 nesting season, 36 passerine nest boxes were monitored and maintained. These boxes produced two successful prothonotary warbler nests with eight hatchlings and four successful Carolina wren nests with 17 hatchlings.

SPECIES INVENTORY AND AVIAN NEST PREDATION TRAPPING

WLWCA staff began utilizing numerous trapping techniques to generate an inventory of species found on various types of habitat at WLWCA. In addition to tallying an inventory, trapping was used to reduce avian nest predator density. Methods included the use of camera surveys, Sherman traps, live traps, foot holds, pit falls, drift fences, corral traps and body grips. Data collection for the species inventory has concluded. Data is being compiled in preparation for a report. Avian nest predator trapping will continue as needed.

LEFT: *Rebrushing a rice field lottery hunt blind.* ***CENTER:*** *Banding black-bellied whistling ducks in a walk-in trap.*
RIGHT TOP: *Replacing wood duck nesting box.* ***RIGHT BOTTOM:*** *Wood duck nestlings.*

LEAD TESTING PROJECT

WLWCA staff collected soil samples in various locations on WLWCA. Some samples were sifted through for lead pellets and others were submitted to a soil laboratory for lead testing. Samples were processed and data was compiled. Revisions are currently being made to the final report.

MARSH MANAGEMENT RESTORATION, HABITAT ENHANCEMENT, AGRICULTURAL MANAGEMENT, AND MINERAL MANAGEMENT

MARSH MANAGEMENT

The WLWCA property consists of approximately 52,000 acres of fresh water marsh. The marsh is comprised of five separate management units. Within these marsh areas there are over 100 miles of trenasses, seven water control structures, four pumping stations, and over 40 miles of levees, most of which are operated, managed and maintained by WLWCA personnel. Objectives of maintenance and manipulation of the conservation area's system of levees and water control structures vary somewhat by management unit, but generally goals are to maintain marsh health, provide conditions favorable for production of waterfowl habitat, and incorporate multi-species management when possible.

AGRICULTURAL MANAGEMENT

Although WLWCA is comprised mostly of marsh, the property consists of approximately 19,000 acres of agricultural land. The agricultural land is separated into seven tracts that are leased out to the highest bidder. Each leaseholder follows an LDWF lease agreement that directs the leaseholder to complete numerous habitat management practices each year. These practices maintain the property in farmable condition, while also providing valuable habitat for wildlife. The benefits to the leaseholder are the ability to farm, graze and hunt the property.

MINERAL MANAGEMENT

There are three producing oil and gas fields on the WLWCA property that were once operated by Amoco Production Company. Amoco sold the subsurface rights in these fields and all the facilities associated with these fields in the latter part of the 1990s to Hilcorp Energy Company. Hilcorp has since sold these fields, and for a period of time they were operated by three separate owners/operators: the West White Lake Field (approximately 1,500 acres) was owned and operated by Energy Quest; the Florence Field (approximately 1,920 acres) was owned and operated by Dune Energy Company; and the South Kaplan Field (approximately 800 acres) was owned and operated by Texas Petroleum Investments. In the spring of 2010, Texas Petroleum Investments purchased the West White Lake and Florence Field and became the sole oil and gas operator on the WLWCA property. However, in July 2011 Magnum Producing secured a mineral lease from BP to drill an exploratory well in the Kaplan Field Area. LDWF granted a Surface Lease to Magnum Producing to facilitate the drilling of this well. This well was successfully completed and is currently producing. In 2013 LDWF granted Magnum Producing an additional Surface Lease for a Salt Water Disposal Well, which also included a road servitude and P/L right-of-way agreement. The State of Louisiana owns the surface of the property that comprises these three production areas. LDWF monitors surface activities and helps enforce the conservation terms of the agreements that were executed by and between Amoco Production Company, BP and the three owners/operators mentioned. Texas Petroleum Investments has responsibilities for maintenance of roads, levees, canals, bridges, etc.

MAINTENANCE OF FACILITIES AND EQUIPMENT

There are approximately 55 acres of property associated with the WLWCA office, dorm, lodge facility, sporting clay course, skeet range, birding trail, and Florence Canal Landing area. This acreage was maintained throughout the year by WLWCA personnel.

Routine maintenance on the WLWCA buildings and equipment was conducted throughout the year.

Routine maintenance was performed on our fleet of more than 25 boats.

2020 HURRICANE SEASON REPAIRS

Hurricane Laura caused minor roof damage to various structures, but repairs were completed by LDWF staff. Hurricane Delta caused significant damages to facilities. Due to the extent of roof damages, FP&C was tasked with creating a Scope of Work and bid package for roofing contractors to complete the roof repairs. These repairs have not begun.

2021-2022 FINANCIAL REPORT

Totals	
Beginning Fund Balance 2021-2022	$3,555,429
Total Revenue	$1,042,291
Total Expenditures	$678,341
Ending Fund Balance 2021-2022	$3,919,379

Expenditures	
Salaries	$241,909
Wages	$74,955
Related Benefits	$156,901
Travel	$1,843
Operating Services	$77,663
Supplies	$90,266
Professional Services	$603
Other Charges	$0
Acquisitions	$27,075
Major Repairs	$5,935
Interagency Transfers (insurance)	$1,189
Total	***$678,341***

Revenue	
Group Hunt Trip Fees	-
Group Hunt Charitable Contributions	-
Agricultural Leases	$566,789
Hunting Leases	$411,000
Alligator Egg Collection	-
Lottery Hunt Fees	$89,305
Alligator Trapping Income	$4,082
Interest Income	$3,551
Land Rental	-
Surface Leases	$31,431
Surplus Property	$24
FEMA Reimbursements	-
Oil and Gas Royalty	-
Non-Consumptive Trips	-
Fishing Lottery	$4,910
Prior Year Revenue Adjustments	$1,400
Fund Transfer from Facility Planning	-$70,200
Total	***$1,042,291***

LOUISIANA WILDLIFE DIVERSITY PROGRAM

The Louisiana Wildlife Diversity Program (WDP) is charged with the conservation of Louisiana's rare, threatened, and endangered plant and animal species, all nongame birds, and natural communities. WDP staff conducts, guides, funds, and facilitates research, monitoring, and inventory of Species of Greatest Conservation Need (SGCN) and their associated habitats as identified in LDWF's Wildlife Action Plan. In addition, WDP staff directs and provides on-the-ground management to maximize habitat restoration to benefit at-risk species. The WDP also maintains a geospatial database of all at-risk elements. These data are vital for determining potential adverse impacts to the environment from proposed construction and development projects and for providing guidance to prevent, minimize, or mitigate such impacts. Data are also frequently requested by researchers and other conservation professionals to inform scientific studies or restoration. The WDP is composed of subject-matter experts who focus on botany, community ecology, zoology, State Wildlife Grants and the Louisiana Wildlife Action Plan, and database management.

WDP OUTREACH AND PUBLIC EVENTS

In addition to WDP staff regularly interacting with the public during field work, staff participated in many outreach presentations and public events throughout Louisiana in FY 2021-2022 including:

- Louisiana Master Naturalist Program spring and fall workshops
- Guest speakers for university courses and birding and gardening clubs
- Articles for the Wildlife Insider
- Articles for the Louisiana Conservationist
- Provided species accounts for the Field Guide available on the LDWF website
- National Hunting and Fishing Day
- Louisiana Pearlshell Outreach Education workshop
- Printed 1,000 pamphlets of the "Louisiana Native Plant Resource Guide for Gardeners and Landscapers" and began distribution

SCIENTIFIC RESEARCH AND COLLECTING PERMITS

Review and issuance of Scientific Research and Collecting Permits for all rare, threatened, and endangered species and all terrestrial species, including insects and plants, are in the purview of the WDP. Scientific Research and Collecting Permits are utilized by many researchers from bird banders to mussel surveyors. During FY 2021-2022, 103 Scientific Research and Collecting Permits were issued to academic institutions, museums, consultants, private individuals, and others. These permits are issued at no-cost. Permit holders are mandated to submit reports at the expiration of their permits; occurrence data of rare, threatened, and endangered species provided in these reports assist the WDP in supporting its mandate to conserve at-risk species.

WILDLIFE ACTION PLAN AND STATE WILDLIFE GRANTS PROGRAM

In November 2001, the U.S. Congress created the State and Tribal Wildlife Grants (State Wildlife Grants) Program "for the development and implementation of programs for the benefit of wildlife and their habitat, including species that are not hunted or fished." The inclusion of species that are not hunted or fished (i.e. nongame species) is a crucial aspect of the State Wildlife Grants Program, as many of these at-risk species previously had no existing source of funding. The State Wildlife Grants Program is now the primary funding source for nongame conservation nationwide, with the stated goal of preventing species from being federally listed as threatened or endangered.

WILDLIFE ACTION PLAN AND REVISIONS

In order to participate in the State Wildlife Grants Program, Congress mandated that states develop a Comprehensive Wildlife Conservation Strategy (i.e. a state wildlife action plan). In response, LDWF developed the Louisiana Wildlife Action Plan to establish conservation needs and guide the use of State Wildlife Grants funds for the next 10 years. A crucial aspect of the Wildlife Action Plan is the identification of SGCN, those species most in need of conservation action as identified by each state. Coauthored by WDP staff and peer-reviewed by a diverse group of colleagues from state and federal agencies, academia, nongovernmental groups, citizen scientists and others, the Wildlife Action Plan is truly a collaborative effort by subject-matter experts best positioned to positively affect conservation and restoration actions in our state. The first edition of the Wildlife Action Plan was submitted to the USFWS National Advisory Acceptance Team for approval and was subsequently approved in December 2005. The Wildlife Action Plan is the roadmap for nongame conservation in Louisiana, and, as a living document, must be reviewed and revised at least once every 10 years to ensure that it remains a nimble and effective tool for conservation planning and implementation.

The first comprehensive revision (i.e. second edition) of the Louisiana Wildlife Action Plan was completed and submitted to USFWS during FY 2015-2016, and final approval was received from USFWS during FY 2016-2017. The second edition added several chapters to the treatise including treatments on invasive species, the impacts of climate change, and the delineation of Conservation Opportunity Areas. During FY 2019-2020, WDP staff finalized a minor revision which included the addition of 17 reptile and amphibian SGCN and updated the associated habitat types, added one new invasive species, and revised the invasive species Tiers. In FY 2021-2022, staff attended climate-science webinars and participated in Wildlife Action Plan standardization meetings with coordinators from several southeastern states. These efforts are in preparation for the next big revision due in 2025.

The Louisiana Wildlife Action Plan (2015) is available via the LDWF website (*www.wlf.la.gov/assets/Resources/Publications/Wildlife_Action_Plans/Wildlife_Action_Plan_2015.pdf*).

GRANT MANAGEMENT ACTIVITIES AND STATE WILDLIFE GRANTS FUNDING CYCLE OF FY 2021-2022

The State Wildlife Grants Program is funded by annual congressional appropriations. USFWS apportions these funds to state fish and wildlife agencies based on the land area and population of each state. Since the inception of the State Wildlife Grants Program, the State of Louisiana has received approximately $17.5 million in federal State Wildlife Grants funding, with an apportionment of approximately $800,000 in FY 2021-2022. Louisiana has funded 200 projects through the State Wildlife Grants Program to date; funded projects have included biological inventories, monitoring, research projects, habitat management, and the development

and maintenance of databases. A wide range of SGCN has benefited from State Wildlife Grants funding in Louisiana, including freshwater mussels, alligator snapping turtle, reddish egret, whooping crane, swallow-tailed kite, Neotropical migratory landbirds, Louisiana black bear and many more.

State Wildlife Grants proposals are accepted by the WDP on an annual basis and include projects developed by LDWF personnel, nongovernmental organizations, universities, and others. State Wildlife Grants proposals are reviewed by LDWF's State Wildlife Grants Committee, consisting of 10 biologists of varying expertise from the Office of Fisheries and the Office of Wildlife.

During FY 2021-2022, 12 new project proposals were submitted to USFWS for approval (*Table 1*). At the end of the state fiscal year, 29 ongoing State Wildlife Grants-funded projects remained (*Table 2*).

Twelve State Wildlife Grants were closed in FY 2021-2022 (*Table 3*). Copies of final reports for all closed State Wildlife Grants are available to interested parties upon request. LDWF submitted 41 grant reports to USFWS during FY 2021-2022. A total of 15 formal grant amendments were submitted to and approved by USFWS. Since the inception of the State Wildlife Grants Program in Louisiana, research funded through these grants has produced over 70 peer-reviewed publications, adding greatly to the body of knowledge of Louisiana's fish and wildlife and their habitats.

DATA SECTION

The WDP procures and compiles occurrences and associated data of rare, threatened, and endangered animal and plant species and natural communities. Constantly updated data are integral in determining the status and state rankings of these at-risk elements. These data drive the direction of nongame species' projects and conservation in Louisiana. The information is stored in a secure, centralized, geospatial database known as Biotics, developed by NatureServe, with whom the WDP collaborates. Biotics currently houses more than 10,500 records of Louisiana's Element Occurrences, carefully vetted data on SGCN and their associated habitats collected by staff biologists or conservation partners.

The Biotics database is used daily by WDP staff to review proposed construction activities and development projects planned by gov-

TABLE 1.

New Louisiana State Wildlife Grants Opened During FY 2021-2022	
Louisiana State Wildlife Action Plan Comprehensive Revision 2025	Herp SGCN 2022
Life History of the SGCN Pontchartrain Painted Crayfish (*Faxonius hobbsi*) in Louisiana	Using Environmental DNA to Survey for Amphibians and Reptiles of Greatest Conservation Need in Two Established Priority Amphibian and Reptile Conservation Areas
Eastern Spotted Skunk Baited Camera Trap Array Surveys on Coastal Prairies	Benefits of Native Seed Mixes for Wild Pollinators in Longleaf Pine Habitats
Habitat associations of Chuck-Will's-Widow (*Antrostomus carolinensis*) and Greater Roadrunner (*Geococcyx californianus*) in managed pine forest: a pilot study using autonomous recording units	Parameterizing a Matrix Population Model to Inform Management of Razor-backed Musk Turtles in Louisiana
State Wildlife Grants Program Coordination and Administration 2022	Invertebrates, Mammals, and Aquatic SGCN 2022
Detection of Species of Greatest Conservation Need using Camera Traps, with an Emphasis on Eastern Diamond-backed Rattlesnakes, Harlequin Coralsnakes and Black Pinesnakes	Natural Communities of Louisiana 2022

TABLE 2.

Ongoing Louisiana State Wildlife Grants During FY 2021-2022	
Completion of the SPDOR VHF Network to Inform Conservation of SGCN: Phase II Extension	Two-year Survey of the Occurrences, Distributions, Habitats, and Threats to Four Crayfish and the Frosted Elfin
Assessing the Conservation Status of the Western Sand Darter Using Both Field and eDNA Approaches	A Search for the Imperiled Eastern Beard-grass Skipper
SGCN Database and Environmental Review	Estimating the Distribution of Unionids and the Western Sand Darter in the Sabine and Calcasieu Rivers Using eDNA
Distribution, Abundance, Nesting, and Movements of Reddish Egrets in Louisiana	Wildlife Habitat Inventory Initiative
Invertebrates, Mammals, and Aquatic SGCN	State Wildlife Grants and State Wildlife Action Plan Coordination
Assessing Seaside Sparrow Abundance, Distribution, Annual Survivorship and Nesting Productivity in Southwest Louisiana	West Gulf Coastal Plain Prescribed Burn Initiative
Update on the Current Status and Distribution of Three Rare LA Freshwater Mussels: the Pyramid Pigtoe, Alabama Hickorynut and Rayed Creekshell	East Gulf Coastal Plain Prescribed Burn Initiative
Turtle SGCN	Herptile SGCN
Natural Communities of Louisiana	Building a Genetic Database for Mississippi Diamondback Terrapins in LA for Repatriation Efforts and Demographic Analysis
Coastal Prairie Conservation Opportunity Area Corridor Evaluation and Survey	Distribution, Population Size, and Habitat Assessment of Crayfish SGCN in the Eastern Florida Parishes of Louisiana
Wild Bees in Fire-managed Eastern Upland Longleaf Pine Ecosystems	Using Land Cover to Refine Conservation Opportunity Areas in Louisiana
Movement Patterns of Diamondback Terrapin (*Malaclemys terrapin*) within Barataria Bay	Population Size and Ecology of Four Rare Dragonflies in Louisiana
Occurrence of Western Chicken Turtle	Assessment of the Effects of a Planned Coastal Island Restoration on Seabirds and Their Nest Predators
Status Survey for Bluenose Shiner in the Pearl River Drainage in Louisiana	Razor-backed Musk Turtle Surveys
Distribution, Population Size, and Habitat Assessment of Crayfish SGCN in the Eastern Florida Parishes of Louisiana	

TABLE 3.

Louisiana State Wildlife Grants Closed During FY 2021-2022	
Breeding Bird Surveys	Collection and Analysis of American Eels in Louisiana
Distributional Assessment of Imperiled Fishes in Louisiana	Assessing the Current Status and Distribution of Southern Crawfish Frogs in Louisiana
Population Monitoring and Surveillance for White-nose Syndrome in Six Bat SGCN in Louisiana	Louisiana Amphibian Monitoring Program
Gulf Coast Box Turtle Re-surveys	Anuran SGCN Data Collection and Analysis
Survey of Crayfish SGCN and Associated Species Assemblages in Central and Northern Louisiana and Southern Arkansas	Conservation Status and Distribution of Mussels in the Lower Reach of Bayou Bartholomew Drainage
Distribution and Abundance of Three Co-occurring SGCN Turtle Species in the Pearl River, Louisiana	Pass-a-Loutre Bird Enhancement Project - Phase 2

TABLE 4. Wildlife Diversity Program database updates in FY 2020-2021.

CATEGORY	# TYPES OF ELEMENTS*	# NEW SOURCE FEATURES	# NEW ELEMENT OCCURRENCE RECORDS
Mollusks	11	61	24
Tarantulas	1	6	6
Fishes	9	112	90
Amphibians	1	1	1
Reptiles	10	48	33
Birds	1	4	3
Mammals	4	525	157
Plants	3	3	3
Natural Communities	1	1	1
Total	***41***	***761***	***318***

**Number of animal or plant species or natural communities*

Few Louisianans realize that our state is home to the Texas Brown Tarantula (Aphonopelma hentzi), but this secretive, docile animal may be found in rocky areas of central and north Louisiana.

ernment, industry, and other private entities throughout the state in order to determine potential impacts of the projects on SGCN and natural communities. Proposed projects range from small-scale construction such as cell phone towers, residential, commercial and industrial development, and dredging activities to large-scale construction such as pipeline projects and interstate development. Clients may also request digital data for proposed project siting or for scientific studies; data may be queried by the species of interest, the client-supplied project footprint, the footprint plus a buffer, or by 7.5-minute USGS quadrangle (quad) boundaries. Because persistence of native species is constantly threatened by loss and alteration of habitat, an up-to-date database of known Element Occurrences is crucial for informing decisions on countering such threats - minimizing, mitigating or eliminating the threats altogether.

In April 2020 (i.e. FY 2019-2020), the Data Section received State Wildlife Grants funding for the "Species of Greatest Conservation Need Database and Environmental Review" project, which provides the WDP with additional latitude in project reviews and data requests. This allows additional maintenance of the database and further ensures that new and updated records are available to inform construction, development, conservation and restoration projects in Louisiana.

DATABASE MAINTENANCE

During FY 2021-2022, almost 900 Source Features, the building blocks of Element Occurrence Records, were added (761) or updated (129) in Biotics along with the associated information such as geographic location, habitat condition, emerging threats, and population status (*Table 4*). These Source Features resulted in more than 600 new or updated Element Occurrence Records. Newly added records (318) included 41 animal and plant SGCN and natural communities - mussels (11 species), tarantulas (one), fishes (nine), toads (one), lizards (one), snakes (one), turtles (eight), birds (one), and bats (three), skunks (one), plants (three), and natural communities (one). Additions and updates resulted from actual new detections from field surveys of staff or contractors but also from museum records.

PROJECT REVIEWS

For practical purposes, project reviews are subdivided into three types. One subset of project reviews, referred to as private consultant projects, are submitted by consulting firms on behalf of government and private entities. The requesting organization submits a description of the proposed project as well as a detailed map to the WDP, and a query of the WDP database determines the SGCN and natural communities within one mile of the project area. A comment letter identifying potential impacts to SGCN, communities, and critical habitats is submitted to the requesting organization. The letter also indicates the presence of scenic rivers and state and federal parks, wildlife refuges, and WMAs occurring within 0.25 miles of the project area.

WDP also receives Coastal Use Permits submitted to LDWF by LDNR. Coastal Use Permits are required for commercial, residential, and oil and gas projects occurring within Louisiana's Coastal Zone. LDNR houses an abridged version of the WDP database, allowing LDNR to flag Coastal Use Permit projects that occur near at-risk elements. These flagged permit applications are forwarded to WDP biologists for further review. As with private consultant reviews, comments are generated for potential impacts to SGCN, critical habitats, and natural communities. The presence of scenic rivers and state and federal parks, wildlife refuges, and WMAs within the project area are also included in the comment letter. The WDP's comments, along with comments from other programs within LDWF, are compiled and an agency-wide letter is submitted to LDNR.

In addition, WDP reviews USACE permit applications as well as applications from other regulatory agencies. These reviews are collectively referred to as internal project reviews due to the fact they are received by WDP from other programs within LDWF.

In FY 2021-2022, the WDP Assistant Data Manager conducted 1,422 project reviews, which included 364 private consultant project reviews, 965 new or modified Coastal Use Permits and 93 internal project reviews.

DATA REQUESTS

To receive data, a requesting organization submits a description of the proposed project to WDP, and a query of the WDP database shows the SGCN and natural communities within a predetermined distance stated in the client's project request letter. A response letter identifying potential impacts to SGCN, natural communities, and critical habitats, along with point and/or polygon data and associated species and habitat information are provided to the requesting organization. The information provided by the WDP is applied to land use decisions, environmental impact assessments, resource management, conservation planning, threatened and endangered species reviews, species status assessments, research, and education. In FY 2021-2022, the WDP Data Manager processed 61 digital data requests from state and federal agencies, private consultants, timber companies, nonprofit organizations, and universities. Thirteen (~21%) of the 61 requests were utilized for conservation planning (12 requests) or academic research (1). Forty-seven requests (~77%) related to environmental compliance of industry including oil/gas facilities, pipelines, and timber. One request (~2%) related to buyouts of flood-prone properties. As in the previous fiscal year, solar projects continued to comprise a significant portion of requests (13 of the 47 industry requests in FY 2021-2022). However, pipeline construction/abandonment projects comprised the largest portion of industry requests (17 of the 47).

LOUISIANA WATERSHED INITIATIVE

After two significant flooding events in Louisiana in 2016, the Louisiana Senate passed a resolution in 2017 that required the state to facilitate efficient watershed management. Via an Executive Order the following year, Louisiana Governor John Bel Edwards established the Council on Watershed Management, an interagency collaboration with representation from five state agencies (Louisiana Office of Community Development, CPRA, Governor's Office of Homeland Security and Emergency Preparedness, Louisiana Department of Transportation and Development and LDWF) tasked with leadership of the Louisiana Watershed Initiative. The Louisiana Watershed Initiative seeks to more holistically manage water resources in the state and to address contraindicated "solutions," recognizing that earth-moving projects may benefit one watershed region, while adversely impacting neighboring regions. Given the magnitude of the charge, multiple technical advisory groups were formed, populated by subject-matter experts from diverse backgrounds from public relations to data modeling to ecology. The WDP Data Manager represents LDWF on the Louisiana Watershed Initiative Planning Technical Advisory Group. The Planning Technical Advisory Group's main responsibilities are to make recommendations to the Council on Watershed Management on delineated boundaries of the different watershed regions and the expected content and level of detail of a statewide watershed management plan, which may then be scaled down to regional watersheds. Like other Louisiana Watershed Initiative LDWF representatives, the WDP Data Manager works to ensure that watershed plans and projects avoid, minimize, or mitigate negative impacts to wildlife and their habitats and emphasize the vital ecosystem services provided by more natural watersheds. Work in FY 2021-2022 included the roll out of operational guidance to increase the Louisiana Watershed Initiative's cohesion among state agencies as well as completion of Nature Based Solutions guidance documents, which emphasize the use of natural functions in flood risk management.

BOTANY & COMMUNITY ECOLOGY SECTION

The main responsibilities of the Botany and Community Ecology Section include:

- Actively monitoring all at-risk (rare, threatened, and endangered) or otherwise sensitive plant species and natural communities in Louisiana to ensure conservation and management actions benefit those elements
- Promoting proactive measures to preclude the need for federal listing of plant species as threatened or endangered and working to improve the status of those plants that are already listed as such
- Conducting botanical inventories and ecological assessments on all types of land ownership
- Interacting with landowners and managers to promote conservation of native plants and natural communities
- Administering the Natural Areas Registry Program
- Implementing habitat stewardship practices on LDWF-owned properties and private lands
- Providing plant identification services to LDWF staff, natural resources professionals with other state and federal agencies or private entities, and the public
- Contributing expert knowledge on Louisiana's natural community ecology and flora for conservation decision making processes including environmental impact reviews, conservation planning, and habitat management
- Providing direction, guidance, and oversight to LDWF interns and other staff working on botany and community ecology projects

BOTANY & COMMUNITY ECOLOGY SECTION PROJECTS

Most of the work of the Botany and Community Ecology Section is grant project-based. Currently, all 10 projects are being carried out successfully using external grant support:

- Natural Areas Registry Program (State Wildlife Grants)
- Botanical and Ecological Surveys on Kisatchie National Forest (USDA Good Neighbor Agreement)
- Longleaf Pine Flatwoods Savanna Restoration and Management Plan for Kisatchie National Forest (USDA Good Neighbor Agreement)
- Coastal Prairie Conservation Opportunity Area Corridor Evaluation and Survey (State Wildlife Grants)
- Natural Communities of Louisiana (State Wildlife Grants)
- Louisiana Quillwort Population Status Assessment in Southeast Louisiana (USFWS Section 6)
- Earth-fruit Status Assessment (USFWS Section 6)
- Texas Trillium Population Status Assessment on Private Lands in Caddo Parish, Louisiana (USFWS Section 6)
- Wildlife Habitat Inventory Initiative (State Wildlife Grants)
- Southwest Louisiana Coastal Prairies (USFWS State Wildlife Grants/EPA)

The Louisiana quillwort (Isoetes louisianensis) is a state and federally listed endangered species that may be found along creeks in the eastern Florida Parishes.

NATURAL AREAS REGISTRY PROGRAM

Almost 90% of Louisiana's 43,566-square-mile area is privately owned. Therefore, private landowners hold the key to conservation of Louisiana's native habitats and the animal and plant species they support. Motivated by this fact, the Louisiana Natural Areas Registry was created by an act of the Louisiana legislature (Acts 1987, No. 324, §1, eff. July 6, 1987) to establish a program through which landowners of all types may voluntarily agree to protect the natural integrity of their properties, thereby safeguarding the best remaining examples of the state's natural heritage. Enrollment of properties in the registry involves a voluntary, non-binding agreement between landowners and LDWF. The Natural Areas Registry Program is coordinated by the WDP Botany and Community Ecology Section. To date, more than 100 properties are enrolled in the registry, capturing more than 50,000 acres distributed across at least 38 of Louisiana's 64 parishes.

Responsibilities of the Natural Areas Registry Program include:

- Assessing habitats on existing Natural Areas and providing information to landowners
- Evaluating properties for potential inclusion in the Natural Areas Registry
- Enrolling new properties in the Natural Areas Registry
- Providing technical assistance regarding species and habitat ecology and management to landowners
- Directing landowners to outside funding opportunities to implement habitat stewardship, as well as providing direct financial assistance for beneficial management practices on-site
- Implementing appropriate habitat management
- Advocating for protection of Natural Areas
- Modifying agreements and deactivating Natural Areas when appropriate (e.g., ownership changes)
- Distributing a regular newsletter, Bluestem, to registry participants and others interested in Natural Areas

Funding for the Natural Areas Registry Program is provided in the Natural Communities project, supported by the State Wildlife Grants Program. This funding allows for the operation of the program through 2025. A new capability for the registry is the direct implementation of habitat stewardship practices on Natural Areas. Previously, LDWF was limited to assisting landowners in securing funding elsewhere for habitat management. However, a new process was devised whereby landowners of enrolled properties may request assistance. The initial intake period for landowner assistance requests began in summer 2017. During that first cycle, Delacroix Preserve Natural Area received funding to manage invasive species on the property with an emphasis on controlling Chinese privet (*Ligustrum sinense*) and feral hogs. Evergreen Farms at Carter's Bottom and Sugar Creek Farm received funding for prairie and pollinator enhancement plantings. Evergreen Farms was planted in spring 2019 and has been burned twice by the landowners since that planting. Sugar Creek Natural Area was planted in winter 2020, and the planted area received its first burn in winter 2021-2022. Seven site visits were made to existing registry properties for either ecological checkups or landowner assistance and consultation. Eleven site visits were made to assess new, potential registry properties. In addition to the above mentioned site visits, WDP staff assisted private landowners with fire line maintenance and prescribed fire on two coastal prairie sites.

BOTANICAL AND ECOLOGICAL SURVEY ON KISATCHIE NATIONAL FOREST

A cost-sharing position between LDWF and USFS was created under the authority of a USDA Good Neighbor Agreement to support a botanist to perform botanical and ecological surveys on Kisatchie National Forest. These surveys target rare, threatened, and endangered species, nonnative invasive species, and natural community assessments. The surveys aim to document new elements and to update previously detected elements within focal project areas slated for timber harvests, restoration projects and other habitat management activities. Deliverables include stand-level status update reports within each project area and georeferenced detections of at-risk plant species, sensitive habitats, and invasive plants. In addition to these responsibilities, the USFS requested assistance from WDP staff to develop a longleaf pine flatwoods savanna restoration and management plan for a large portion of Kisatchie National Forest that was damaged by wind and storm events in 2019 and 2020.

During the latter half of FY 2021-2022, the LDWF/ Kisatchie National Forest Botanist was tasked with developing a longleaf pine flatwoods savanna restoration and management plan for a 7,324-acre section of the Vernon Unit which received extensive damage from hurricanes and other wind events. The project goal is to advance this section towards desired future conditions through ecological restoration, research, and management as described in the Kisatchie National Forest Revised Land and Resource Management Plan. Additionally, this work is aligned with and supports the restoration standards, goals, and objectives identified in the America's Longleaf Restoration Initiative.

Several projects from the previous reporting period extended into FY 2021-2022, such as L'Ivrogne-Horsehead Creek Sub-watershed survey (Kisatchie Ranger District) and the Little Sandy Creek Sub-watershed (Kisatchie Ranger District). During these project surveys on the

Kisatchie Ranger District, two Ozark chinquapin (*Castanea ozarkensis*) trees were found with little sign of nonnative chestnut blight, a disease caused by a pathogenic fungus. The Ozark chinquapin is listed as critically imperiled (S1) in the State Wildlife Action Plan. After closer inspection with members of the Ozark Chinquapin Foundation, both trees were producing chestnuts. These trees, along with Ozark chinquapins from two other locations in north Louisiana, may be the key to developing chestnut blight resistant Ozark chinquapins with Louisiana genetics. Additionally, several new occurrences of sandstone glades and western hillside seepages bogs were identified in the L'Ivrogne-Horsehead Creek Sub-watershed and the Little Sandy Creek Sub-watershed. The status of all records are being updated in the USFS and WDP databases. WDP botanists also surveyed Natural Areas on the Kisatchie National Forest to provide damage assessment information to USFS resource managers. Sites surveyed included calcareous woodlands, Drakes Creek Bog Natural Area, Cooter's Bog Natural Area, and two calcareous prairie restoration sites. In addition to the hurricane damage surveys and the Natural Area surveys, LDWF botanists identified a new infestation of nonnative laurel wilt, a disease caused by a pathogenic fungus, killing mature redbay (*Persea borbonia*) and sassafras (*Sassafras albidum*) trees along Kisatchie Bayou, Sandy Creek and other tributaries in and around Compartments 54 and 60 of the Kisatchie Ranger District.

COASTAL PRAIRIE CONSERVATION OPPORTUNITY AREA CORRIDOR EVALUATION & SURVEY

Coastal prairie is an extension of tall-grass prairie from the eastern Great Plains. Historically, this grassland occupied approximately 2.2 million acres in southwest Louisiana. Because of modern agriculture practices, less than 0.2% of this prairie remains intact in Louisiana. The Coastal Prairie Research and Stewardship Initiative began in 2013 following the discovery of new coastal prairie remnants in the Lake Charles area that quadrupled the known acreage of remnant prairie in Louisiana. Calcasieu and Cameron parishes still feature a considerable amount of grazing lands, in contrast to the prairie region of Acadiana, which is largely under rice or sugarcane cultivation. The newly discovered prairie remnants are used as rangeland. While "passive" farming has been carried out on some of this prairie acreage, most of the rangeland prairies has never been plowed, which would have greatly undermined the integrity of the community by disrupting the microbial community and destroying the root and seed bank.

Remotely sensed data are being used to identify additional grasslands that could serve as connective corridors or buffer properties for known coastal prairie remnants within the Sabine Prairie and Calcasieu Prairie conservation opportunity areas. The results of these data could assist with conservation and management of grassland dependent SGCN in Louisiana. The remotely sensed data were used to classify land cover within and adjacent to known coastal prairie remnants and native grassland reestablishments. Two methods of identifying potential coastal prairie remnants were employed. The first method included using a NVDI/EVI mask created by contractors at LSU, while the second method incorporated remote sensing techniques using LiDAR and true color aerial imagery.

LSU contractors developed two masks/models to identify areas in southwest Louisiana that had the highest probability of being a coastal prairie remnant. The second remote sensing technique, used to identify potential gaps in the masks, will be incorporated into ground-truthing efforts to further refine the masks/models. Currently the masks have identified 21,241 acres that are most likely to be prairie remnants. These masks were very helpful in locating properties that had intact pimple mounds, presumably indicating unplowed land. WDP staff identified and contacted all of the appropriate landowners to request access to their properties for qualitative evaluative surveys and ground-truthing. This project is ongoing, and we hope to update with ground-truthing efforts during the next reporting period.

FAR LEFT: *Fall scenery in Louisiana's Kisatchie National Forest can be spectacular; the LDWF Ecologist sets down his gear to photograph the scene.* ***ABOVE:*** *LDWF Community Ecologist Brian Sean Early keys out plants while in a glade in Kisatchie National Forest.* ***LEFT:*** *This pink sundew (Drosera capillaris) was observed by LDWF staff during a site visit to the longleaf pine flatwoods savanna restoration site on Kisatchie National Forest; this site was damaged by hurricanes and other wind events in 2020 and 2021.*

LDWF Community Ecologist Brian Sean Early and student interns survey coastal prairie plots at Gray Ranch.

NATURAL COMMUNITIES OF LOUISIANA

Natural community identification and management are crucial to the conservation of Louisiana's native animal and plant species. Through this grant, LDWF works with organizations and individuals to achieve conservation goals identified in Louisiana's Wildlife Action Plan. Objectives of this grant are to perform

1. technical assistance;
2. research, surveys, data collection, and analyses;
3. outreach activities; and
4. direct habitat and species management that will benefit the natural communities of Louisiana and ensure conservation actions are implemented.

Through funding from the State Wildlife Grants Program, WDP botanists were able to perform research on Louisiana natural communities and provide technical guidance to public, nongovernmental organizations, private businesses, and all levels of government agencies. During FY 2021-2022, WDP botanists provided technical assistance to over 180 individuals and organizations and identified over 152 plants from general and technical inquiries. WDP botanists conducted about 50 natural community surveys on private and public lands, exceeding 5,000 acres. This grant also supported natural community surveys and the development of natural community conservation benchmarks for Clean Water Act Section 404 Wetland Mitigation Banks. These surveys included communities such as coastal prairies, flatwoods ponds, longleaf pine flatwoods savannas, shortleaf pine-oak-hickory woodlands, and calcareous prairies, aiding in further development of assessment tools and habitat restoration techniques. WDP staff coordinated with the LSU Botany Club, the Louisiana Master Naturalist program, and private entities to perform floristic surveys, mechanical woody brush removal, herbicide projects, and implementation of prescribed fire at coastal prairie remnants. During FY 2021-2022, Botany and Community Ecology Section staff oversaw installation of fire lines and led crews who burned approximately 400 acres of privately owned coastal prairies. Spring and fall vegetation surveys were completed on a 1,000-acre prairie remnant for an ongoing coastal prairie management study seeking to identify best management practices to restore coastal prairie on actively grazed rangeland. Survey work on additional sites owned by these ranching families is ongoing. Additionally, WDP staff and a botany student intern performed the first quantitative floristic study on marais, which are unique coastal prairie depressional wetland features. The coastal prairie marais data along with other quantitative coastal prairie surveys are being compiled, analyzed and prepared for publication. During these natural community surveys, over 400 plant specimens were collected for identification and to better describe natural community assemblages. These specimens were deposited into local and regional herbaria for preservation. The natural community surveys funded by this grant lead to the discovery of a new jug orchid (*Aspidogyne querceticola*; S1) population, which, in North America, is only know from Florida, Mississippi, Louisiana, at Waddill WMA.

LEFT: *Prescribed fire, such as this example from Cox Prairie in January 2022, is an important management tool is grassland systems.*
RIGHT: *LDWF staff observes as a prescribed burn conducted at Gray Ranch overtakes a large bush of yaupon (Ilex vomitoria); prescribed fire is beneficial for its consumption of woody plants in grasslands.*

LEFT: *LDWF Community Ecologist Brian Sean Early teaches students of the LSU Botany Club how to press plants while on a hike at Abita Creek Flatwoods Preserve.* ***RIGHT TOP:*** *This grassland with Texas coneflower (Rudbeckia texana) was observed at the Gray Ranch prairie site.* ***RIGHT BOTTOM:*** *Purple passionflower (Passiflora incarnata) is a primary host plant for the caterpillars of Louisiana's official State Butterfly - the Gulf fritillary (Dione vanillae); this passionflower was photographed at the Gray Ranch prairie site.*

Additionally, this grant provided funding for four student research internships focusing on several imperiled natural communities. These internship projects included investigations of calcareous prairies, coastal prairies, longleaf pine savannas and flatwoods ponds. The student interns worked with WDP staff to develop research concepts, sampling designs, data collection, and analyses for their respective projects. All four interns successfully completed their internships, and one student presented project findings at the Louisiana Native Plant Society Annual Symposium. Another student presented project findings at the Louisiana Association of Professional Biologists conference.

In addition to this research, WDP botanists also participated in outreach and education events by supporting and teaching Louisiana Master Naturalist classes, providing plant identifications to public and private entities, and contributing articles to the LDWF Wildlife Insider newsletter. WDP staff continued to maintain and develop the Louisiana Native Plant Gardens to provide outreach opportunities and celebrate our state's natural beauty. This was accomplished by holding garden work days that were staffed by WDP personnel and volunteers. Due to the workload required to maintain the gardens, WDP hired an outside contractor to assist with the final design and maintenance of the gardens. The gardens contain two interpretive stations and over 160 native plant species grouped into smaller gardens to resemble natural communities across Louisiana. Many people come to view the gardens and learn about various natural communities, native plants, and how to support wildlife in an urban landscape. In FY 2021-2022, LDWF staff finalized the development and printed 1,000 pamphlets of the Louisiana Native Plant Resource Guide for Gardeners and Landscapers. This guide, along with many supplemental educational resources, are available on the LDWF website (*www.wlf.la.gov/resources/category/plants-and-natural-communities*). Funding from this grant also supported collaborative work with Quail Forever, LDWF Private Lands biologists and private landowners.

THREATENED AND ENDANGERED PLANT SPECIES

Of the more than 300 species of at-risk plants included in Louisiana's Wildlife Action Plan, four species are federally listed as threatened or endangered:

- Earth-fruit (*Geocarpon minimum*) - threatened
- American Chaffseed (*Schwalbea americana*) - endangered
- Louisiana Quillwort (*Isoetes louisianensis*) - endangered
- Pondberry (*Lindera melissifolia*) - endangered

During FY 2021-2022, WDP botanists focused on earth-fruit, quillwort and a third species under federal review for inclusion in Endangered Species Act protections - the Texas trillium (*Trillium texanum*).

Earth-fruit Status Assessment

In FY 2021-2022, WDP botanists attended Zoom meetings with USFWS staff and other Natural Heritage botanists to provide input and feedback on the USFWS' Species Status Assessment of earth-fruit. Information provided by WDP staff, combined with information from other heritage program staff, was used to guide USFWS in their reassessment of the federal rank of this currently threatened species. This information was utilized to guide the creation of management recommendations for the species and to inform the Species Status Assessment. In addition to working with partners to assess the status of earth-fruit, WDP staff worked with colleagues from The Nature Conservancy and the LDWF Restoration Program to review and provide feedback on drafts of the earth-fruit Species Status Assessment. In addition to providing valuable feedback on the Species Status Assessment, WDP staff have continued to work with private landowners in Caddo Parish to

facilitate the donation of a property that contains saline prairie to the Land Trust for Louisiana so that the site can be conserved long term. Saline prairie is the habitat in which earth-fruit is found.

Texas Trillium Surveys in Northwest Louisiana

Texas trillium is a spring ephemeral, perennial herb known from less than 30 locations in East Texas and Northwest Louisiana. This species is currently under review by USFWS for possible listing under the Endangered Species Act, which prompted the need to prioritize surveys of known populations in Louisiana and to search for potential new sites with suitable habitat. In spring 2019, Botany and Community Ecology Section staff surveyed all three known locations for this species in Caddo Parish as well as sites with suitable habitat in Bossier Parish. During survey efforts, two populations were determined to be threatened by feral hog activity, and one population was determined to be healthy and secure. The landowners at one threatened site are utilizing the property as a private hog hunting club. Due to the heightened threat of increased hog activity, staff requested permission from the landowners to remove Texas trillium plants. Approximately 50 individual plants were transplanted to The Nature Conservancy's Caddo Black Bayou Preserve. During a follow-up survey at Caddo Black Bayou Preserve in spring 2020, about 60 stems of Texas trillium were observed, with one of those stems being in flower. Given that Texas trillium is not known to be a prolific flower producer, having only one individual in flower is not surprising. In spring 2021, Botany and Community Ecology staff continued to transplant Texas trillium plants from the privately owned hog hunting club; this time, plants were transplanted to an additional site on Caddo Black Bayou Preserve. During follow-up surveys at the two sites on the preserve in spring 2021, a total of about 120 stems, one of which was in flower, was observed.

In March 2020 (i.e. in FY 2019-2020), the private hog hunting club property was revisited by WDP botanists and Dr. Beth Middleton (USGS) to reassess the status of the trillium population and to collect and transplant specimens to a second location at Caddo Black Bayou Preserve. In addition, Dr. Middleton collected specimens to be cultivated and studied at the USGS Wetland and Aquatic Research Center in Lafayette. Dr. Middleton grew the collected specimens in a controlled garden setting to study potential environmental constraints on the species such as shading and drought to better understand environmental stressors and further enhance the conservation of the species. In 2022, initial results from shade experiments were published in the Journal of the Botanical Research Institute of Texas. In addition to the controlled garden experiments, LDWF and USGS staff set up game cameras on flowering Texas trillium specimens in the garden and successfully captured images of invertebrates visiting the plants. This study will likely be extended to wild and introduced populations of the species in Caddo Parish in order to better understand the plant's pollinators.

ZOOLOGY SECTION: Threatened, Endangered & Other At-risk Species; Reptile & Amphibian Program; Nongame Bird Program

THREATENED, ENDANGERED AND OTHER AT-RISK SPECIES PROJECTS

The WDP administers federal aid grants for SGCN through the Endangered Species Act Section 6 Program, Multi-state State Wildlife Grants, and Louisiana's State Wildlife Grants Program. Section 6 projects included threatened and endangered species coordination and work on the following species: Louisiana pearlshell, Louisiana pinesnake and gopher tortoise. Section 6 Cooperative Agreements were renewed among LDWF, USFWS and NOAA.

Section 6 Projects

Section 6 funds allowed staff to work on a multitude of rare, threatened and endangered species issues and to participate in regional and national meetings including:

- Participation in the annual Southeast Association of Fish & Wildlife Agencies virtual meeting, associated working groups, and committee meetings including the Wildlife Diversity Committee, to address at-risk species in the southeastern U.S.
- Participation in the annual Association of Fish and Wildlife Agencies virtual meeting, associated working groups, and committee meetings including the Amphibian and Reptile Conservation Committee Meeting
- Continued partnership with USFWS and NRCS on Endangered Species Act coordination
- Prescribed burning of public and private properties
- Mississippi Longleaf Implementation Team Steering Committee - Louisiana State Representative
- White-nose syndrome surveillance, coordination, and response planning
- Collection and preservation of petitioned crawfish DNA for genetic studies
- Participation in the annual Gopher Tortoise Council virtual meeting and Steering Committee meetings
- Gopher tortoise population assessment, habitat improvement, and public outreach
- Collaboration with private landowners for gopher tortoise status and habitat restoration
- Response and coordination for waif gopher tortoises
- Assessing Hydrologic and Biotic Potential for Conservation of Louisiana Pearlshell Mussels in Small Streams
- Louisiana pearlshell population trends, long-term monitoring protocol, and data management
- Louisiana pearlshell conservation coordination with federal and parish partners and private landowners
- Louisiana pinesnake research and monitoring
- Maintenance of database of West Indian manatee sightings and response to stressed/dead manatees

ZOOLOGICAL STATE WILDLIFE GRANTS PROJECTS

Zoological projects funded through State Wildlife Grants included:

- Breeding Bird Surveys
- Multi-state Sandhills/Upland Longleaf Restoration Project
- Anuran SGCN Data Collection and Analysis
- Gulf Coast Box Turtle Re-Surveys
- Louisiana Amphibian Monitoring Program
- Statewide Passive Detection for Organismal Research (SPDOR) Wildlife Tracking VHF Network
- Invertebrate, Mammal, and Aquatic SGCN
- Turtle SGCN
- Herp SGCN

SPECIES STATUS ASSESSMENTS

Staff represented LDWF on the following Species Status Assessments:

- Plains Spotted Skunk (provided data; reviewed draft of Species Status Assessment and provided comments)
- West Indian Manatee (provided data; member of the Technical Team)

- Pearl River Map Turtle (provided data; reviewed a draft of the Species Status Assessment and provided comments)
- Western Chicken Turtle (provided data; member of Technical Team)
- Gopher Tortoise (data entry; reviewed a draft of the Species Status Assessment and provided comments)
- Earth-fruit (provided data; member of the Technical Team)

LOUISIANA PEARLSHELL

The Louisiana pearlshell (*Margaritifera hembeli*), a freshwater mussel species, is endemic to Grant and Rapides parishes in Louisiana and is listed as state and federally threatened. Surveys for this species have been ongoing since 1985. The WDP is responsible for surveying all private lands where this species occurs. Staff continue to work closely with private landowners and federal partners to facilitate the recovery of the species and conserve its habitat.

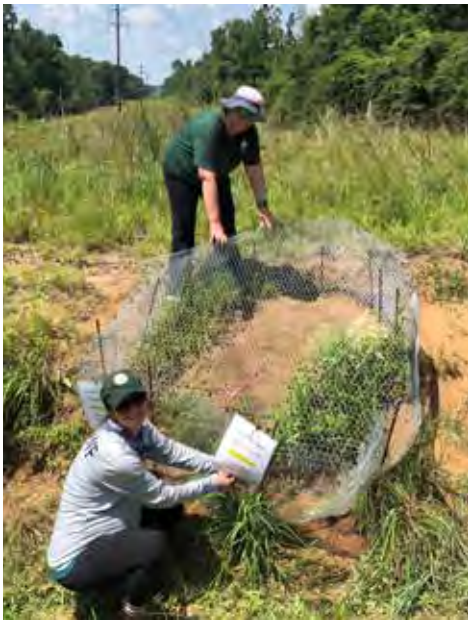
Louisiana pearlshell may occur as scattered individuals throughout a creek or as aggregations (beds of 100+ mussels). During FY 2021-2022, WDP staff detected 1,836 scattered individuals and 14,000 aggregated individuals across eight creeks. Staff detected 19 aggregations across approximately 13 kilometers of creek on private lands. Seventeen of the aggregations were in Grant Parish, and the remaining two were in Rapides Parish. The largest of these aggregations contained 3,709 individuals, while the smallest aggregation contained 101 individuals. The median aggregation size was 393 individuals, while the average aggregation size was 737 individuals.

GOPHER TORTOISE

The gopher tortoise (*Gopherus polyphemus*) can be found in Tangipahoa, Washington and St. Tammany parishes and is listed as state and federally threatened in Louisiana. During FY 2021-2022, a gopher tortoise nest was discovered at Sandy Hollow WMA. To deter depredation of the nest, a protective barrier of chicken wire was enclosed around the nest; one live hatchling from this nest was documented, marked, and released in a nearby adult female gopher tortoise burrow. In order to assess gopher tortoise population status and habitat conditions, WDP staff also conducted a site visit to a tract of private land in St. Tammany Parish in December 2021. Seven burrows were found on three food plots surrounded by dense loblolly pine plantation; using a burrow camera, three tortoises were observed in burrows. A gopher tortoise nest was found on a food plot approximately 10 feet from an adult burrow. Unfortunately, the presence of crushed eggshells suggests that this nest was depredated. A live tortoise hatchling was discovered face down in a depression created by a feral hog. Due to the low chance of survival in the wild, this hatchling was transported to the LDWF Lafayette Regional Office and is being head-started in captivity to increase its size and chance of survival upon release. Once restoration activities have created more suitable habitat for tortoises at the site, the juvenile tortoise will be returned to the original capture location. WDP staff provided a field lecture to a Southeastern Louisiana University biology class at Sandy Hollow WMA; gopher tortoises and restoration of longleaf pine and upland pine habitats were discussed.

WDP staff attended the annual Gopher Tortoise Council Meeting virtually and presented an update on conservation actions for Louisiana. The Louisiana Gopher Tortoise State Report was submitted for inclusion in the Gopher Tortoise Council newsletter The Tortoise Burrow. WDP staff continue to collaborate with state, federal, and nongovernmental partners region-wide on the Gopher Tortoise Range-Wide Conservation Strategy to work towards species recovery by prioritizing and implementing action items and assessing threats to the species. WDP staff also reviewed various development projects in St. Tammany and Washington parishes to assess potential impacts to gopher tortoises and provided consultations on preventative measures, as necessary. Additionally, coordination with USFWS and other state and federal partners was initiated to address the increasing impacts from solar energy development.

LDWF continues to collaborate with NRCS staff to enroll private landowners into the Working Lands for Wildlife Program, which provides opportunities for financial and technical assistance. WDP staff coordinated a field site visit with NRCS staff and private landowners in St. Tammany Parish to discuss habitat restoration opportunities. Additionally, WDP staff coordinated with NRCS staff and a private landowner enrolled in the Natural Areas Registry Program for participation in a media outreach request to promote the Working Lands for Wildlife Program and the Longleaf Pine Initiative. WDP staff also continue to coordinate with LDWF WMA staff to prioritize and implement habitat restoration on Sandy



LEFT: *LDWF staff installed an exclosure around a gopher tortoise nest on Sandy Hollow WMA to help prevent avian and mammalian predation, thereby increasing hatchling survival. High juvenile mortality and low recruitment is one of the leading causes of population declines for this species.* ***RIGHT:*** *This lone survivor from a gopher tortoise nest was found in a depression created by a feral hog on a food plot on private land in St. Tammany Parish in December 2021. The other eggs appeared to have been depredated. LDWF staff are head-starting this hatchling to increase its likelihood of survival in the wild.*

Hollow WMA in order to provide optimal habitat for gopher tortoise, northern bobwhite, and wild turkey. WDP staff will continue to build partnerships with private landowners and timber companies to survey new properties and conduct habitat restoration efforts to increase the amount of quality habitat for tortoises. During FY 2021-2022, WDP staff implemented prescribed burning on 795 acres (350 acres of longleaf pine and 445 acres of loblolly pine) within the gopher tortoise range in Louisiana. Previously planted in longleaf pine by LDWF, a 245-acre tract on non-industrial, private land in St. Tammany Parish received prescribed burning in spring 2022. A total of 550 acres of upland pine (445 acres of loblolly pine and 105 acres of longleaf pine) was burned in spring 2022 on industrial timberland in Washington Parish. All properties house gopher tortoises, with one containing the largest known population for the state. Land acquisition for gopher tortoise conservation remains a goal of this program and, coupled with habitat restoration, is critical to create a long-term viable population in Louisiana.

LOUISIANA PINESNAKE

USFWS listed the Louisiana pinesnake (*Pituophis ruthveni*) as a federally threatened species on April 6, 2018. Prior to listing, LDWF signed the "Programmatic Candidate Conservation Agreement with Assurances for the Louisiana Pinesnakes" to promote forest management practices that increase suitable habitat for the species and protect private landowners from future regulations. Since the creation of the agreement, private landowners have voluntarily enrolled approximately 8,541 acres for management of the Louisiana pinesnake, with 3,943 of those acres intensively managed for the species. WDP staff continue working with federal and nongovernmental partners to conserve the species. Additionally, WDP staff assisted USFWS with providing a response to the Louisiana Pinesnake Safe Harbor Agreement and Section 106 Review. WDP staff also attended a meeting with stakeholders to discuss the Louisiana Pinesnake Population Management Plan and Species Survival Plan and provided a unified response from LDWF on merging the north and south populations through the captive rearing process. Stakeholders discussed and addressed issues with a confirming a potential release site for 2023.

During FY 2021-2022, WDP staff continued to monitor several Louisiana pinesnake populations throughout the state with box-trap-arrays. Personnel detected no Louisiana pinesnakes over 1,176 box trap-nights. In addition to box-trap-arrays, WDP staff continued to utilize camera-trap-arrays to detect Louisiana pinesnakes. Cameras detected eight Louisiana pinesnakes over 11,248 camera trap-nights. Two of the detected snakes were new individuals, and four were recaptures from previous trapping. It is unknown if the remaining two individuals are new or recaptures due to the poor photographs obtained by the cameras.

RED-COCKADED WOODPECKER

WDP personnel continued to implement the Louisiana Statewide Red-cockaded Woodpecker (*Dryobates borealis*) Safe Harbor Program to benefit the federally and state-listed endangered species. Over the life of the program, LDWF has entered into 15 Safe Harbor Management Agreements with nonfederal landowners. A total of 488,519 acres are currently enrolled in the Red-cockaded Woodpecker Safe Harbor Program with 104 baseline red-cockaded woodpecker family groups and two above baseline red-cockaded woodpecker family groups. The Red-cockaded Woodpecker Safe Harbor Program Coordinator conducted annual site visits to six Safe Harbor Program properties. During these site visits, staff confirmed compliance of voluntary red-cockaded woodpecker management activities implemented by landowners on their properties, and staff provided technical assistance regarding red-cockaded woodpecker management. WDP staff continued to promote the Safe Harbor Program via press releases, presentations at public forums, and the LDWF website.

WDP personnel continued to perform red-cockaded woodpecker demographic monitoring and management for 12 red-cockaded woodpecker family groups at Alexander State Forest WMA located in Woodworth. These activities include, but are not limited to:

1. annual activity status checks of 200+ cavity trees,
2. capture and color banding of adults,
3. nest checks and nestling color banding,
4. fledgling checks to determine survivorship,
5. artificial cavity installation and maintenance,
6. midstory control in 14 red-cockaded woodpecker cluster sites and
7. technical assistance to Louisiana Department of Agriculture and Forestry staff regarding beneficial timber management practices for the species.

WEST INDIAN MANATEE

The West Indian manatee (*Trichechus manatus*) is a transient species in Louisiana, occasionally traveling from Florida during the summer months when water temperatures are warm. Manatees typically return to Florida by October when water temperatures begin to decrease in Louisiana. WDP staff coordinated with USGS, USFWS, Florida Fish and Wildlife Conservation Commission, Alabama Department of Natural Resources, Dauphin Island Sea Lab, Audubon Zoo and Texas Parks and Wildlife staff and exchanged information on manatee sightings across their range. WDP staff documented sightings reported by LDWF staff and the public and used this information to update the WDP database. In FY 2021-2022, three sightings of live manatees were reported in Louisiana, including one in St. Tammany Parish, one in Vermilion Parish, and one in Tangipahoa Parish. LDWF responded to three manatee strandings, including one in Terrebonne Parish, one in St. Bernard Parish and one in Calcasieu Parish. Manatee caution signs (posted at all public boat launches in the state) include the LDWF 24-hour dispatch number to assist and encourage citizens to report live manatee sightings as well as possibly injured or deceased manatees. WDP staff reviewed various development projects,

This Louisiana pinesnake (Pituophis ruthveni) was first captured in 2015 as a juvenile and has since doubled its length and increased its weight sevenfold.

including those associated with the Louisiana Watershed Initiative, to assess potential impacts to manatees and provided consultations on minimization of those impacts, as necessary. WDP staff prepared a Manatee Stranding Response Manual containing proper protocols for responding to dead and live strandings. WDP biologists also represented LDWF on the Manatee Species Status Assessment Technical Team this fiscal year.

REPTILE AND AMPHIBIAN PROGRAM ACTIVITIES

A need exists to manage, conserve, and restore populations of reptiles and amphibians and their associated habitats in order to ensure that the objectives and requirements of the State Wildlife Action Plan and State Wildlife Grants Program are met. Through the State Wildlife Grants Program, the WDP has been able to implement conservation actions that directly benefit reptile and amphibian SGCN and their habitats. These actions include research, surveys, data collection and analysis, technical assistance, and outreach activities. The WDP has worked with organizations to achieve conservation goals, provide current information on reptile and amphibian SGCN, and increase public awareness of threats to reptiles and amphibians and their habitats as well as solutions to such threats. WDP biologists have conducted surveys and participated on various technical committees regarding threatened, endangered, and other at-risk herpetofaunal species. The following activities were conducted during FY 2021-2022:

- Responded to 43 public inquiries, constituent requests, and reported sightings of snakes, salamanders, frogs and toads
- Participated on the Southeast Partners in Amphibian and Reptile Conservation (SEPARC) Steering Committee as the new Co-Chair and Louisiana State Representative and attended the annual SEPARC meeting virtually
- Participated on SEPARC's Gopher Frog/Crawfish Frog Task Team
- Attended field meeting with BREC staff and WDP botanical staff to discuss four-toed salamander (*Hemidactylium scutatum*) status and to assess sensitive communities at Palomino Park prior to development on the site
- Reviewed final draft of the Ornate Chorus Frog Conservation Action Plan produced by SEPARC
- Revised and updated LDWF herp poster series for snakes, amphibians and turtles and facilitated printing new hardcopies for distribution
- Reviewed LDWF's current reptile and amphibian regulations and licensing process
- Developed post-hurricane monitoring project proposal for salamanders and anurans within Kisatchie National Forest, Vernon Ranger District
- Participated in outreach request from Louisiana Wildlife Federation - Conserving Earth Radio - to discuss Louisiana's at-risk herp species with USFWS and TX Parks and Wildlife staff.

Restricted Snakes

Act 1221 of the 2005 Louisiana Legislative Session required LDWF to adopt rules regarding possession of all venomous snakes and any large constrictors in excess of 8 feet. Those rules, now RS 76.101.K, include a permit system (Restricted Snake Permit) whereby Louisiana residents or non-residents who bring restricted snakes to Louisiana may conditionally possess such snakes. Restricted snakes must be kept under secure conditions, and those interested in possessing venomous snakes must demonstrate no less than one year of substantial, practical experience (to consist of no less than 500 hours) in the care, feeding, handling and/or husbandry of the species in captivity. Permittees are subject to inspection of facilities by LDWF personnel and, as of 2017, must provide digital images of their facilities as well as an inventory of their restricted snakes. During FY 2021-2022, 46 individuals received permits. WDP staff assisted LDWF Enforcement staff with home inspections, species identifications, confiscations, and re-homing of several unpermitted large constrictors and venomous snakes.

Louisiana Turtle Conservation Plan

Thirty-two species and subspecies of native turtles occur in Louisiana. Several of these species are in need of immediate conservation action to maintain or improve populations to avoid additional species listings. Currently, 19 turtle species are considered SGCN by LDWF with seven of those species listed as state and federally threatened or endangered. Successful conservation requires plans of action to assess species status and to ensure long-term viability of populations. To address these needs, LDWF convened a conservation planning working group to draft the Louisiana Turtle Conservation Plan. The primary objective of the plan is to offer a strategic approach to the restoration and conservation of Louisiana's native turtle species by providing the necessary information to facilitate these actions. This document provides information on the following:

- Life history
- Regulations
- Threats and associated solutions
- Inventory and Monitoring
- Habitat management and restoration
- Partnership and Collaboration

In addition to detailing the topics above, the document includes fact sheets for all species covered by this plan (sea turtles and gopher tortoise are not included in this plan, as they are treated at length in various other documents) as well as the cultural significance of turtles in Louisiana and the history of turtle harvest and farming. LDWF recognizes that the implementation of the strategies outlined in this plan will be contingent upon budgetary constraints. The purpose of this plan is to identify conservation goals, strategies, and actions to help guide management decisions that will contribute to the long-term recovery and sustainability of viable native turtle populations in Louisiana. During FY 2021-2022, LDWF completed the draft document and submitted the draft to 67 colleagues from regional and national organizations and agencies for partner review.

Turtle Species of Greatest Conservation Need State Wildlife Grant

Turtle populations worldwide are declining due to habitat destruction, overharvest for the pet trade and the food trade, nest depredation and destruction, and disease. Although these issues are also of concern for other herptile species, turtles are deemed to be the most threatened vertebrate group in the world. Turtles are long-lived species with delayed sexual maturity, and a lack of recruitment often goes undetected until populations are already experiencing declines. In addition, turtles face harvesting pressures of a greater magnitude than many other species. A need exists to assess, and potentially address, the issues of over-harvesting in Louisiana; to fill life history data gaps; to effectively communicate current conservation data to various technical committees as well as the general public; and to revise, update, and develop rules and regulations. Through the State Wildlife Grants Program, the WDP has been able to begin addressing these turtle-specific needs. The following activities were conducted during FY 2021-2022 for this grant:

- Responded to seven public inquiries, constituent requests, and sighting reports regarding turtles
- Attended the annual Turtle Survival Alliance meeting virtually and presented an

overview of the draft Louisiana Turtle Conservation Plan

- Attended the Partners in Amphibian and Reptile Conservation (PARC) Joint National Steering Committee monthly meeting and provided an update on LDWF's Turtle Conservation Plan
- Coordinated with regional and national partners and LDWF Enforcement staff for participation in a SEPARC/PARC Turtle Networking Team workshop entitled "Combatting the Illicit Turtle Trade in the Southeastern U.S."
- Reviewed LDWF's turtle regulations and licensing process and facilitated meetings with LDWF Licensing and Legal staff to discuss needed revisions and updates
- Reviewed the Pearl River Map Turtle (*Graptemys pearlensis*) Species Status Assessment and provided current data
- Provided field and technical assistance for western chicken turtle (*Deirochelys reticularia miaria*) statewide surveys and coordinated private lands access
- Reviewed USFWS alligator snapping turtle proposed threatened listing information, gathered current LDWF data and prepared/submitted LDWF's official comment letter, attended the USFWS alligator snapping turtle public meeting regarding the proposed listing, and discussed listing implications with LDWF Fisheries staff
- Reviewed and provided feedback on the draft Diamond-backed Terrapin (*Malaclemys terrapin*) Conservation Action Plan
- Worked with LDWF Enforcement staff on various regulation violations, assisted with temporary/permanent placement of confiscated individuals following appropriate health screenings, and developed a release plan for healthy individuals
- Conducted site visit of active turtle farm in Tangipahoa Parish
- Discussed proposed Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) turtle regulation changes with CITES Southeast Association of Fish & Wildlife Agencies representative, provided requested information, and attended virtual meeting
- Coordinated with LDWF Scenic Rivers staff for Scenic Rivers Act violations

USFWS Coastal Program Project - Nesting Habitat Restoration and Nest Protection Measures for the Ringed Map Turtle and Pearl River Map Turtle on the lower East Pearl River

The Pearl River is home to the federally threatened ringed map turtle and the federally petitioned Pearl River map turtle. Quality nesting habitat for these species is typically composed of an open canopy with elevated sandbar deposits, usually found on the inside of river bends. Nesting habitat is generally absent along the lower portions of the Pearl River due to river alterations, with only one naturally occurring sandbar on the lower East Pearl River. Invasive tree species, primarily Chinese tallow (*Triadica sebifera*) and river birch (Betula nigra), have colonized this open sandbar and reduced suitable conditions for turtle nesting. Additionally, previously installed wildlife cameras detected nearly 100% turtle nest depredation, primarily by crows (*Corvus sp*.) and raccoons (*Procyon lotor*). Therefore, there is a significant need to increase nesting area, nest success, and hatchling recruitment for these two map turtles as well as other freshwater turtle species that utilize this sandbar for nesting along the East Pearl River. Likely, project methods and deliverables (i.e. sandbar restoration and nest protection measures) will be applicable to other areas within the Pearl River system and potentially other river systems within the Southeast.

During FY 2021-2022, WDP staff, in cooperation with a contractor, conducted extensive habitat restoration via chainsaw, hand-clear-

Through a USFWS Coastal Program Grant, LDWF staff are restoring the only natural sandbar for nesting freshwater turtles, particularly the federally threatened ringed map turtle and federally petitioned Pearl River map turtle, along the lower East Pearl River. This photograph depicts the southern view of this severely habitat-degraded natural sandbar with limited area for turtles to nest.

ing, and herbicide application using Garlon 4. A nest protection structure (i.e. exclosure) made of hardware cloth and 2"x4" wooden boards was installed over the newly restored sandbar to help minimize nest depredation. Wildlife cameras were deployed at various angles around and within the exclosure to document the level of predator activity on nests and nesting turtles. Granules of wolf urine were scattered around the exclosure as an additional predator deterrent. Preliminary review of camera images shows extensive activity by mammalian predators, particularly raccoons, on this sandbar. Mammalian activity was prevalent both outside and within the nest guard. The 6-inch nest guard height did not appear to prevent raccoons from accessing the turtle nests within guard. However, the nest guard did appear to deter avian predators, particularly crows. Future project tasks will include assessment of all camera images and subsequent data entry. Collaboration on a re-design of the nest guard is currently underway.

NONGAME BIRD PROGRAM ACTIVITIES

Louisiana's avifauna is diverse, encompassing more than 480 species, over 400 of which are nongame species that fall under the responsibility of the WDP. The WDP is responsible for facilitating and directing research, monitoring, and conservation actions for all nongame birds in our state as well as providing peer-review for scientific and layperson products. The bulk of the responsibilities involve coordinating or participating in scaled-down monitoring that feeds into regional, national, or international datasets. During FY 2021-2022 the WDP Nongame Ornithologist (hereafter, ornithologist) maintained the role of coordinating Louisiana's efforts for the North American Breeding Bird Survey (coordinated nationally by USGS), maintaining route assignments and recruiting qualified volunteers, including WDP staff, to ensure adequate coverage of the state's 67 survey routes and timely data submission. The ornithologist and WDP staff conducted and submitted data for 18 Breeding Bird Survey routes distributed statewide, an important contribution to the program's success in Louisiana where willing and qualified surveyors are few. Breeding Bird Survey data represent the primary dataset by which landbird population trends are monitored continentally and at the state level, allowing WDP to evaluate bird SGCN and their conservation needs for the State Wildlife Action Plan. The ornithologist played an important role in conducting winter and spring shorebird surveys of Chandeleur Island, focusing on the threatened red knot (*Calidris canutus rufa*); these surveys were coordinated by the Coastal Bend Bays and Estuaries Program and the Barataria-Terrebonne National Estuary Program. These geographically expansive and long-term bird projects, including the Statewide Passive Detection for Organismal Research (SPDOR) VHF Network (see below), are crucial for the conservation and management of bird SGCN. All of these programs have benefitted greatly from LDWF's financial commitment to nongame birds and have been matched by generous support from ConocoPhillips, the Louisiana Wildlife and Fisheries Foundation, the Barataria-Terrebonne National Estuary Program, and federal aid grant opportunities such as Section 6 funds and the State Wildlife Grants Program. In fact, State Wildlife Grants have contributed, in part, to the majority of the projects previously mentioned. In FY 2021-2022, WDP biologists documented many rare and noteworthy birds, which were submitted for verification and inclusion into state and national datasets, including eBird, thereby contributing to the ever-evolving understanding of bird status, distribution, and trends in Louisiana. The ornithologist assisted in and/or coordinated a number of smaller collaborative field projects, including limpkin (*Aramus guarauna*) surveys [to track its range expansion, which corresponds to that of its primary prey - the invasive giant apple snail (*Pomacea maculata*), whimbrel (*Numenius phaeopus*) roost-site surveys (verifying the continental importance of a roost at Rockefeller Wildlife Refuge), and bird surveys at coastal WMAs and refuges (e.g., Atchafalaya Delta WMA, Isles Dernieres Barrier Island Refuge, Rockefeller Wildlife Refuge) and at restoration sites (Queen Bess Island, Rabbit Island, Isle au Pitre). The ornithologist coordinated and compiled data for three Christmas Bird Count surveys in southwestern Louisiana, including LDWF's White Lake Wildlife Conservation Area, Lacassine National Wildlife Refuge - Thornwell, and Sweet Lake - Cameron Prairie National Wildlife Refuge. WDP biologists alone tallied more than 90,000 individual birds of 134 species on LDWF-coordinated Christmas Bird Counts and documented numerous rare species, including great kiskadee (*Pitangus sulphuratus*), least flycatcher (*Empidonax minimus*), and many other noteworthy records. Twelve surveyors, including WDP biologists, contributed to the White Lake WCA Christmas Bird Count, tallying more than 79,000 birds of 141 species. Results from these and other Christmas Bird Counts in the region continue to highlight the critical need of preserving rice cultivation and culture for the benefit of both the human and bird communities of the re-

While conducting limpkin surveys in the White Lake Wetlands Conservation Area, LDWF staff spotted this great horned owl.

During the Evelyn Breeding Bird Survey in De Soto Parish, the LDWF Nongame Ornithologist observed this lark sparrow (Chondestes grammacus) collecting nesting material.

The least bittern (Ixobrychus exilis) is typically a very secretive bird, so it was surprising when LDWF staff detected this individual during the Kaplan Breeding Bird Survey.

Although not uncommon during migration, the least flycatcher (Empidonax minimus) is rare in Louisiana in winter; this individual was observed by LDWF staff during the White Lake Wetlands Conservation Area Christmas Bird Count.

The palm warbler (Setophaga palmarum) breeds in the boreal forests of Canada and the extreme northern U.S., but the species is very commonly observed along Louisiana's brushy roadsides in winter; this individual was observed during the Sweet Lake - Cameron Prairie National Wildlife Refuge Christmas Bird Count.

gion. The ornithologist also worked to develop additional field projects on yellow rail (*Coturnicops noveboracensis*) habitat use associated with rice agricultural practices (developing a research proposal with regional partners) and on Chuck-Will's-widow (*Antrostomus carolinensis*) habitat use associated with pine forestry and management practices (receiving a State Wildlife Grant).

In addition to the collaborative field work outlined above, the ornithologist spent a significant portion of time representing LDWF on standing committees and working groups and at meetings and workshops. The ornithologist assisted in organizing and executing the Gulf Coast Joint Venture's Bird Nesting Island Cooperative Forum Summit (February 2022), including presenting an update on the status of Louisiana's colonial waterbirds and coastal restoration efforts in the state. The ornithologist also continued representing Louisiana as a co-chair on the Bird Nesting Island Cooperative. The ornithologist served on Gulf Coast Joint Venture's Monitoring, Evaluation, and Research Team's Landbird working group, performing various tasks throughout the year. In addition, the ornithologist continued serving on the Gulf of Mexico Avian Monitoring Network Coordination Committee, the organization's governing body that consists of 15 professional bird scientists, and contributed to its Community of Practice meeting virtually in October 2021. The Gulf of Mexico Avian Monitoring Network's rapidly expanding Community of Practice includes more than 100 individuals representing more than 30 state and federal agencies, universities, nonprofit organizations, and others. The ornithologist also served on LDWF's State Wildlife Grants Committee in FY 2021-2022. Finally, the ornithologist represented Louisiana on the Nongame Bird Technical Section of the Mississippi Flyway Council and participated in Nongame Bird Technical Section efforts to represent the Flyway on important issues affecting nongame birds (e.g., regarding proposed changes to the federal bald eagle incidental take permitting process and to the Migratory Bird Treaty Act incidental take permitting process).

The ornithologist was frequently tasked with print, audio, and video media interviews, including interviews for pieces on American white pelican (*Pelecanus erythrorhynchos*), bald eagle (*Haliaeetus leucocephalus*) and their continued recovery, ivory-billed woodpecker (*Campephilus principalis*) and its delisting due to extinction, and the recent establishment and expansion of limpkin in Louisiana for outlets including The Advocate, The Louisiana Radio Network and North American Birds. The ornithologist worked with LDWF Public Information staff to prepare a feature story in the Louisiana Conservationist on the economic benefits of bird conservation (Summer 2022) and to draft a number of press releases on various bird issues. The ornithologist contributed to other outreach and education efforts on numerous occasions, including giving lectures to public groups on brown pelican (*Pelecanus occidentalis*) and coastal bird restoration (East Baton Rouge Public Library) and on limpkin (Baton Rouge Audubon Society), and at the Louisiana Master Naturalists of Greater Baton Rouge's biannual bird biology workshops. The ornithologist provided additional public outreach by leading field trips for the annual Eagle Expo in Morgan City and the annual Yellow Rails and Rice Festival in Thornwell. The ornithologist also responded to general information requests from the public on issues including bird identification, injured

***LEFT:** Vermilion flycatchers may be found in grassland habitats in southwest Louisiana in winter.* ***RIGHT:** This purple gallinule (Porphyrio martinica) was observed during a bird survey at Atchafalaya Delta WMA.*

birds, nuisance birds, guidelines on avoiding disturbance to birds, and many other topics; in FY 2021-2022, the ornithologist replied, either by phone or email, to a total of 240 such general information requests.

The ornithologist provided significant technical guidance (approximately 90 instances) within LDWF and to partners, other agencies, nongovernmental organizations, consultants, contractors, and industry on a myriad of bird-related issues. Internally, technical guidance involved drafting or reviewing comment letters on behalf of LDWF to federal partners or agencies (e.g., regarding proposed changes to federal rules), drafting written or providing oral comments on bird-related issues for LDWF administrative staff, reviewing scientific research and collecting permit applications, and providing technical input on bird ecology and life history for bird island restoration project development. The ornithologist frequently replied to requests by partners, consultants, contractors, and private industry for technical advice and comments on best management practices and measures necessary to avoid negatively impacting birds associated with coastal restoration activities (e.g., construction buffer reduction requests), industrial work in the vicinity of bald eagle or colonial waterbird rookeries, and survey planning in advance of proposed invasive activities. The ornithologist continued to play an important role in restoration planning to benefit Louisiana's coastal birds, including many SGCN, by participating in technical discussions on the design of upcoming bird island restoration projects being coordinated by the LDWF Restoration Program and the CPRA and funded by the 2010 *Deepwater Horizon* oil spill Natural Resources Damage Assessment settlement. The ornithologist provided technical input on the Midcontinent Shorebird Conservation Initiative's Western Gulf Coast draft documents, which will ultimately form the basis of a hemispheric framework for shorebird conservation in the Americas, and contributed to review and planning of bird survey protocols to be implemented in association with the Chandeleur Island Restoration Project, funded by the Regionwide Trustee Implementation Group and currently in the engineering and design phase.

Louisiana Trustee Implementation Group - Avian Guidance Project

During FY 2021-2022, the ornithologist served as a subject-matter expert for the Louisiana Trustee Implementation Group-funded project entitled "Developing Guidance for Avian Habitat Restoration and Monitoring." This project aims to integrate information on avian ecology and habitat requirements, coastal processes, and coastal engineering and construction specifications to develop guidance for restoration planning, implementation, and monitoring to maximize benefits to coastal bird populations. The ornithologist's responsibilities involved compiling habitat requirements and life history information for 13 species of ground-nesting colonial waterbirds and solitary beach-nesting birds, preparing for and participating in biweekly webinars/conference calls and ad-hoc discussions to convey information to CPRA engineers and The Water Institute of the Gulf staff, and reviewing and commenting on resulting draft documents.

Statewide Passive Detection for Organismal Research (SPDOR) VHF Network

Funded by ConocoPhillips, the Louisiana Wildlife and Fisheries Foundation, Barataria-Terrebonne National Estuary Program, the State Wildlife Grants Program, and LDWF's Rockefeller Trust, the SPDOR VHF Network entered its sixth year. This passive network facilitates radio tracking of hundreds of organisms simultaneously, provided those organisms are first fitted with nanotags (tiny coded radio tags) and then move through the approximately 9-mile detection radius of at least one receiver station. The potential for such a network of stations to contribute to our current knowledge level of SGCN is substantial and is identified as a strategy for the conservation of landbirds in Louisiana's Wildlife Action Plan. In addition, this network contributes to the projects of many other scientists currently utilizing the Motus Wildlife Tracking System, an international collaborative network of scientists that is coordinated and maintained by Birds Canada, and thus provides invaluable migratory connectivity data that may inform full annual cycle conservation efforts. As of June 2022, the WDP's network of receiver stations had logged more than 1,800 detections of approximately 460 individual research birds of 33 species, primarily shorebirds (13 species, including the federally threatened red knot) and songbirds (13 species), but also one to two species each representing nightjars, rails, seabirds, herons, and falcons. This work has almost limitless potential for collaborating with other agencies, industry, nongovernmental organizations, academia, and others from across the Western Hemisphere. Activities in FY 2021-2022 included regular downloading of data from receiver stations, uploading these data to the Motus network, repairing two damaged stations, and demobilizing equipment damaged by the hurricanes of the fall seasons of 2020 and 2021, and planning for deployment of three new stations in FY 2022-2023. As of June 2022, SPDOR VHF receiver stations were active at LDWF's Grand Isle Marine Lab Facility, LDWF's Baton Rouge HQ, LDWF's Lafayette office, Richard K. Yancey WMA, and Audubon Aquarium of the Americas in New Orleans.

WDP SCIENTIFIC PRESENTATIONS

Cauley-March, H. and C.E.L. Matusicky, 2022. A Floristic Quality Assessment of Coastal Prairie Using Modified Whittaker-Stolgern Sampling Design Louisiana Association of Professional Biologists Research Symposium. Ruston, LA.

Dobbs, R.C. 2021. Louisiana colonial waterbird restoration and monitoring. Seabird Working Group Session, GoMAMN Community of Practice Meeting, Virtual, October 2021. Oral.

Dobbs, R.C. 2022. Louisiana update, February 2022. Gulf Coast Joint Venture Bird Nesting Island Cooperative Meeting, Virtual, February 2022. Oral.

Lejeune, K.L. 2021. Louisiana Gopher Tortoise Conservation Efforts. The 43rd Annual Gopher Tortoise Council Meeting, Virtual, November 2021. Oral.

Matusicky, C.E.L 2022. Pilot Study of the Floristics in Marias Endemic to the Coastal Prairies within the Gulf Coastal Plain. Louisiana Native Plant Society Annual Symposium, Woodworth, LA. Oral.

Middleton, B, Williams, C.R., Doffitt, C, & Johnson, C. 2022. Effects of shading on the rare plant species, *Physostegia correllii* (Lamiaceae) and *Trillium texanum* (Melanthiaceae). Journal of the Botanical Research Institute of Texas. 16(2): 591-603.

FURBEARER MANAGEMENT

MONITORING FUR HARVEST

The 2021-2022 furbearer harvest was monitored by compiling distribution and total harvest data. Each year, fur buyers and dealers are required to submit reports providing information on pelts purchased by species and parish of harvest. Annual audits of all fur dealers provide a record of total pelts by species shipped from Louisiana. Individual trappers are also required to submit records of pelts harvested that they shipped out of state. River otter and bobcat possession tags provide data on timing and location of all bobcat and otter harvested in the state. These tags are necessary to ensure that Louisiana otter and bobcat are tagged with federal export tags (a federal requirement for out-of-country shipment). Additionally, a trapper harvest survey was emailed to every trapper with an email address saved in the Louisiana Outdoors database (approximately 70% of licensed trappers).

Records indicate 3,180 trapping licenses were sold during the 2021-2022 trapping season. Of these, 2,761 were adult residential licenses (18 and older) and 62 were adult non-residential trapping licenses. These figures show a 1.7% increase in trapping licenses sold when compared to the previous season (3,127). Youth (under 18) no longer need a separate trapping license, instead, trapping privileges are included with their youth hunting license.

A total of 4,239 animals were harvested and sold for fur (all species), which was an increase from the previous season's total of 3,898. The total value of the 2021-2022 fur harvest to the state's trappers was estimated at $42,641.94. This total value was an increase from the previous season's total of $26,403.46.

The 2022 trapper harvest survey had a response rate of 28.7%. A total of 73,530 (all species) are estimated from survey responses to have been harvested by trappers during the 2021-2022 season. The most common reason for why trappers participated in the industry was for nuisance control (27.2%), followed by participation in the Coast-wide Nutria Control Program (17.4%). People that conduct nuisance control activities and trap for recreational and/or commercial purposes followed at 12.6%. The most common type of trapping reported was land trapping with 28% of respondents being strictly land trappers.

TABLE 5.

10-YEAR AVERAGE VALUE FOR EACH SPECIES					
Species	Trapper harvest survey estimated harvest	Total Harvest for the 2021-22 Fur Market (shipping data)	10-year Average Harvest (shipping data)	Average Price Paid Per Pelt (includes cost of green fur as well as dried fur)	10-year Average Value for each species (2012-2022)
River Otter	1,700	856	1,241	$23.23	$45,036.46
Raccoon	25,000	937	4,788	$1.93	$25,275.87
Bobcat	1,100	208	376	$33.10	$15,371.20
Nutria	38,200	11	5,223	$1.93	$10,871.92
Beaver	9,300	1,577	1,702	$6.95	$12,908.71
Mink	3,800	511	573	$4.94	$4,498.34
Gray Fox	1,200	36	252	$6.16	$3,135.62
Muskrat	680	56	609	$1.81	$2,665.34
Red Fox	350	9	46	$5.58	$751.55
Coyote	6,600	32	84	$5.16	$668.65
Opossum	7,600	5	138	$1.74	$124.30
Total	73,530	4,239	15,032	$42,641.94	$121,304.95

The nutria harvest (203,824) decreased by 108,294 from the previous season's total of 312,824. The average nutria pelt price paid to trappers during this past season was $2. An additional $6 was paid for all nutria taken during the Coast-wide Nutria Control Program by registered participants.

COAST-WIDE NUTRIA CONTROL PROGRAM

The Coast-wide Nutria Control Program is funded by the Coastal Wetlands Planning, Protection and Restoration Act. The objective is to decrease nutria-induced damage to coastal vegetation by increasing the incentive for harvest. During the 2021-2022 season, a total of 203,824 nutria tails, worth $1,222,944 in incentive payments, were collected from 200 participants. This showed a decrease in participation from the previous year's 284. The fewest number of tails turned in by a single participant was 13 and the greatest number of tails by a single participant was 9,778. Approximately 3% of active participants turned in 800 or more tails. Of the 66 participants who turned in 800 or more tails, 14% turned in more than 4,000 tails.

TOTAL NUMBER OF NUTRIA HARVESTED BY METHOD OF TAKE IN 2020-2021

Nineteen parishes were represented in the 2021-2022 program season with harvests ranging from 114 to 44,085 nutria per parish. The greatest number of tails (44,085) were collected from St. Mary Parish, followed by Terrebonne (41,530) and Plaquemines Parish (19,071).

The predominant method of take was by rifle (50%), followed by shotgun (35%) and by trapping (16%).

March was the most active month for harvesting nutria (65,281 tails) while November was the least active month (4,353 tails). (See Coast-wide Nutria Control Program 2021-2022 Report, Coastal Wetlands Planning, Protection and Restoration Act Project LA-03b, nutria.com/site13.php).

VEGETATIVE DAMAGE CAUSED BY NUTRIA

As a monitoring requirement of the Coast-wide Nutria Control Program, a coast-wide aerial survey was conducted in April 2022 covering the coastal parishes of Louisiana. Twenty-three sites were visited in 2022, 23 of which were identified as having nutria damage in 2021. One site was identified as recovered and no new sites were identified during the 2022 survey.

The 22 nutria-damaged sites observed along transects during the 2022 survey had a total of 1,248 acres impacted by nutria feeding activity (4,682 extrapolated). This is approximately a 45% decrease in acres impacted by nutria since the 2021 survey (2,250 acres,

extrapolated to 8,436 acres coast-wide). The Coast-wide Nutria Control Program continues to be a successful means of controlling the nutria population with an average of over 300,000 animals harvested annually. Despite the reduced level of harvest the past few seasons, the program has been successful in achieving its goal and the number of nutria-impacted acres in Louisiana's coastal marsh has decreased significantly over the 19 seasons of the program.

FUR ADVISORY COUNCIL

The Fur Advisory Council continued to focus on two major goals during FY 2021-2022. The first goal was to educate the public concerning the role of wildlife utilization in conservation and habitat management, which serves to address public opinion of the fur market. The second goal was to educate both new and experienced trappers on state regulations, best management practices and handling fur from the field through the finishing process.

The Fur Advisory Council has continued to interface with the public through local events such as the Destrehan Plantation Heritage weekend, Ocean Commotion, 4-H events and library presentations. The council engaged in multiple K-12 science focused events and a number of summer educational camps. Department staff also presented at school-wide events with Louisiana themes. The council website carried the educational story to a much broader audience (*www.louisianafur.com*).

LDWF has worked with the Association of Fish and Wildlife Agencies to construct an online trapper education course and see it advertised across LDWF platforms and on local trapper websites (*conservationlearning.org/login/index.php*). LDWF also partnered with the Louisiana Trappers and Alligator Hunters Association to provide a series of hands-on trapping workshops to compliment the online course, which the Fur Advisory Council has supported with supplies and resources. Five trapping workshops were held in FY 2021-2022 around the state, and three three-day trapping schools were held: two were at the Woodworth Educational Center and the third was at the LEAF Center at Hodges Gardens. Students learned about trap preparation, skinning and hide care, regulations and best management practices. The council has worked to make sure that the art of fur trapping continues as part of Louisiana's living heritage.

CONTRACTS

LDWF contracted with Glenn Delaney to monitor legislation in Washington D.C. that may impact Louisiana's furbearer management program. Mr. Delaney works closely with the Louisiana delegation to educate them on issues important to LDWF and the Fur Advisory Council. Notable legislation that Mr. Delaney has provided expert analyses on include the Refuge from Cruel Trapping Act and the Preventing Future Pandemics Act. Both of these contain provisions that attempt to undermine the principles of sustainable use and impose global bans on legitimate wildlife trade. Mr. Delaney has also sought funding to benefit a variety of Louisiana wildlife management programs including work to secure funding for a CITES ePermiting system to facilitate wildlife trade in Louisiana.

ALLIGATOR PROGRAM

Louisiana's Alligator Management Program consists of two complex segments: research/management of the wild population and a statewide farm/ranch program. The program is funded by alligator industry generated revenues (alligator hide tag fees, shipping label fees, alligator hunting license fees, and other alligator related fees).

WILD ALLIGATOR PROGRAM

Inventory methods, harvest regulations, tagging and reporting requirements, and a complex computer program are continually upgraded to regulate and monitor a sustainable-use alligator management program in Louisiana. Annual coast-wide alligator nest surveys are conducted to index alligator populations and to establish harvest quotas in coastal Louisiana. During the summer of 2021 we estimated that 64,345 alligator nests were present in the coastal marsh habitats; another very productive year due to optimum marsh water level and habitat conditions.

Wild alligator harvest quotas are established to correlate harvest with alligator population density and distribution. Alligator harvest tags are allocated to individuals who either own or lease land that is considered alligator habitat. Digital landowner and survey information are combined with the latest aerial photography images to allow for an accurate assessment/classification of each participant's property. The majority of the lands enrolled in the wild alligator harvest program have been entered in the GIS system for property ownership and habitat assessment.

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 of 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.

Under this sustained use alligator program, over 1.1 million wild alligators have been harvested since 1972. The annual harvest takes place in September and October to spe-

FIGURE 1. LOUISIANA COASTAL MARSH ALLIGATOR NEST PRODUCTION (1970-2021)

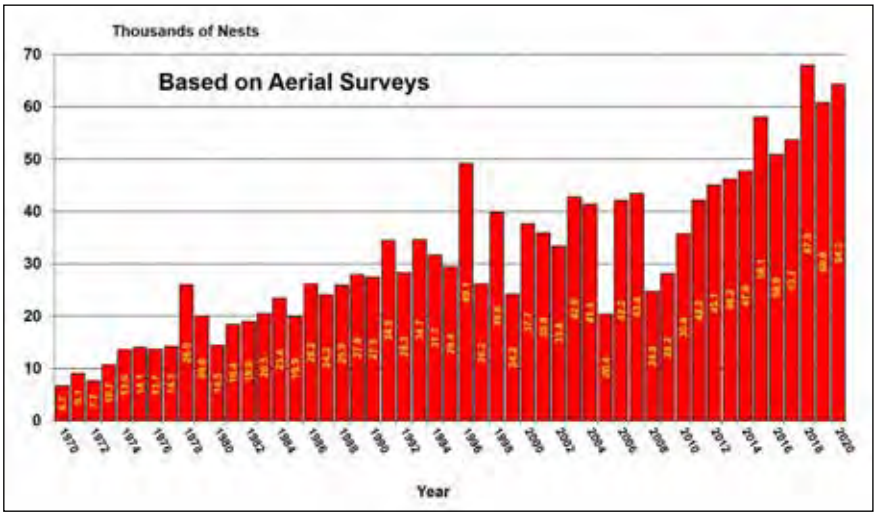


FIGURE 2. LOUISIANA WILD ALLIGATORS HARVESTED (2021 REGULAR HARVEST SKIN LENGTHS)

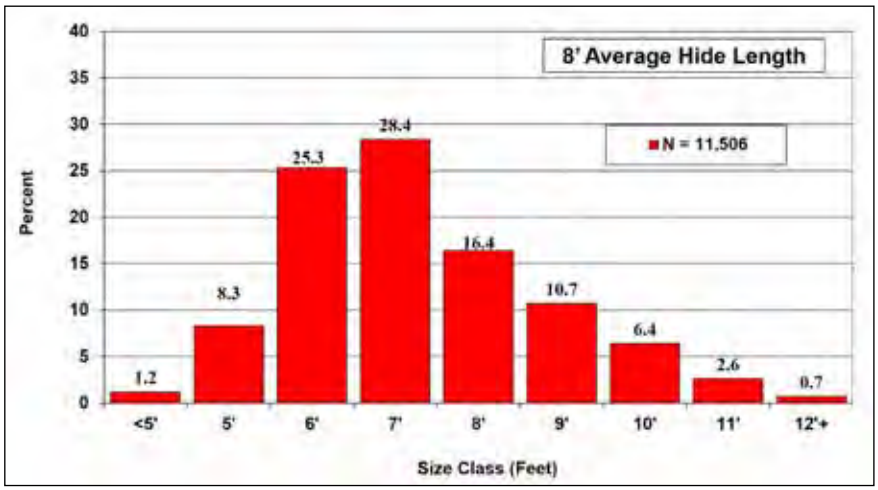
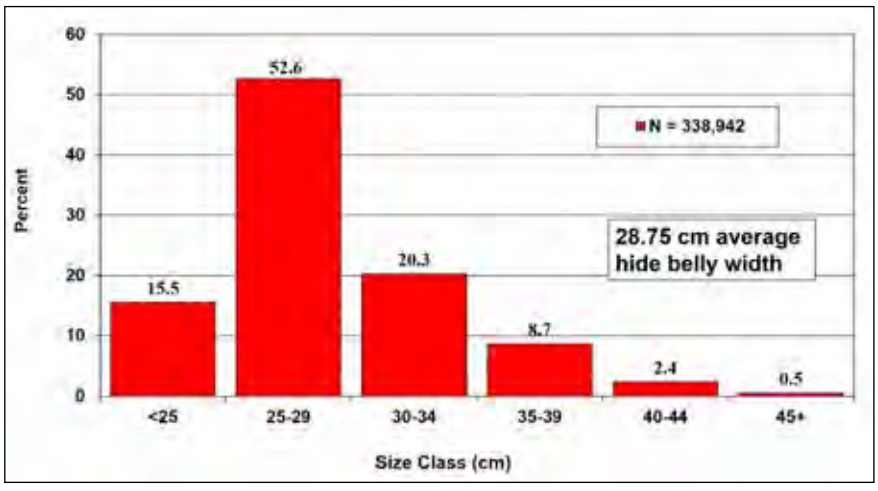


FIGURE 3. LOUISIANA FARM ALLIGATORS HARVESTED (2021 SKIN BELLY WIDTHS)



cifically target the adult males and immature segments of the alligator population. 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. During the 2021 wild season, a total of 14,348 alligators were harvested by 3,060 licensed alligator hunters. Alligators harvested averaged 8.0 feet in length, with an estimated value of over $3 million. Adult-sized alligators (those 6 feet and larger) comprised the majority of the harvest. This decrease in harvest is the result of reduced hunting effort in the East Zone due to the negative impacts of hurricane Ida, as well as a depressed hide market worldwide caused by the COVID-19 pandemic.

LDWF provided additional alligator harvest opportunities for the general public by continuing its lottery alligator harvest program. In 2021, the lottery alligator harvest program provided opportunities for 555 alligator hunters to harvest 1,665 alligators. Lottery alligator harvests were conducted on 48 public areas (WMAs and public lakes) throughout the state.

FARM ALLIGATOR PROGRAM

The January 2022 statewide farm/ranch inventory totaled 701,591 alligators, down from 788,224 alligators in January 2021. Nest production was very good in 2021 and egg demand increased from 2020, however, because of the depressed hide market worldwide caused by the COVID-19 pandemic, fewer sub-adult alligators were maintained on farm inventories. However, since late 2016, alligator farm inventories have remained above those observed prior to the worldwide economic recession of 2009. Although slightly reduced, market demand for farm hides remains substantial, but low demand for wild hides continues to be an issue.

During the 2021 tag year (January through December 2021) an estimated 338,942 farm-raised alligators were harvested, averaging 28.75 cm belly width. The total estimated value of these alligators was $70 million.

Farmers participating in the wild alligator egg collection program are required to return a percentage of the eggs hatched as 4-foot alligators, which compensates the wild alligator population for the collection of eggs. This return rate percentage was decreased to 10% in early 2017, to start with the 2017-year egg permits. The remaining animals can be sold by the farmer. During 2021, a total of 35,803 farm-raised alligators were released to the wild. All released alligators were measured, marked, tagged and sexed. Survival of farm-released alligators appears to be similar to wild alligators. Re-trapped alligators were harvested in September 2021, and data on size class and sex ratio collected. Data evaluation continues on survival rates of the farm-released alligators.

Program staff members routinely communicate with various alligator industry participants including trappers, farmers, landowners and dealers. Information is provided regarding wild alligator and alligator egg harvests, harvest statistics and management recommendations (*Table 6*). Staff routinely visit alligator farms providing recommendations on alligator husbandry and culture. Numerous requests for information are handled each year.

NUISANCE ALLIGATOR PROGRAM

LDWF manages a statewide nuisance alligator control program. The nuisance program is designed to remove problem alligators in order to avoid potential human/alligator conflicts. Through the process of nuisance alligator hunter appointments and annual renewals, LDWF maintains a statewide network of qualified nuisance alligator hunters. Nuisance

TABLE 6.

WILD ALLIGATOR EGG COLLECTIONS BY ALLIGATOR FARMERS (2015-2021)

Year	Wild Alligator Eggs Collected	Hatchlings Yielded
2015	465,100	394,231
2016	616,546	548,416
2017	387,373	332,711
2018	587,776	536,361
2019	650,878	579,008
2020	303,883	260,192
2021	462,537	406,208

alligator complaints are phoned into various LDWF offices, where complaints are recorded and then forwarded to a nuisance alligator hunter in the vicinity of the complaint. Nuisance hunters respond promptly and catch and remove the alligator as deemed necessary. Hunters are allowed to harvest the nuisance alligator and to process the meat and skin of the alligator for commercial sale. This process provides for immediate response to problem alligators and for payment to the nuisance alligator hunter, thereby minimizing the program operating costs to the department. Beginning in 2018, LDWF authorized incentive payments of $75 per complaint resulting in the removal of an alligator to participating nuisance hunters to help alleviate challenges presented by low hide prices.

During FY 2021-2022, approximately 50 nuisance alligator hunters were enrolled in the program; annually nuisance hunters respond to several thousand complaints and harvest more than 1,000 alligators.

RESEARCH ACTIVITIES

The following list provides a summary of the various research and monitoring projects that the alligator program staff conducted and/or participated in during FY 2021-2022.

MONITORING

1. Evaluation of Survival, Growth and Reproduction in Farm-Released Alligators - This activity involves numerous projects related to survival analysis, growth, and reproductive success (farm-released vs. native wild). Due to the reduction of the release rate percentage, it is imperative to monitor survival closely. The 12% return rate started with the 2007 permits (releases "due" in 2009); and this was decreased to 10% starting

with the 2017 year permits (returns "due" in 2019. Information on size class frequency distribution of wild alligator populations and susceptibility to harvest is provided annually to enhance survival estimates. We now have "re-traps" that were captured over 20 years since release, and this is undoubtedly one of the largest mark-recapture projects currently in progress. In 2020, we published a manuscript in Herpetological Review that documented survival of a farm-released alligator for over 22 years. Following the survival, growth and dispersal of farm-released alligators is a key component to our management, monitoring and research programs that will continue for many years to come.

2. Coast-Wide Nest Survey: The annual coastal nesting survey is essential for monitoring our alligator population, and is used annually to determine wild alligator and wild alligator egg harvest quotas (for the adult harvest each September as well as egg ranching quotas). This is an integral part of our required "finding of no detriment" needed to achieve export authorization by the USFWS.

3. Evaluation of Statewide Harvest Program: We continue to analyze size class frequency distribution, average size, sex ratios, etc. for alligators harvested each year. This project, coupled with the coast wide nest survey provides critical information regarding the status of the wild alligator population. Data generated from these projects provides the basis for evaluating the impact of our current harvest strategies and for establishment of annual wild harvest quotas.

4. Evaluation of Alligator Nest Density: Department biologists work with cooperating alligator farmers to gain access to their GPS data from annual egg collections. This data will facilitate comparisons between our coastwide nest survey and estimates of nest density as recorded by the farmer during egg collections. Some farmers have advised staff of reduced nest production on selected wetlands; close review of this nesting production data will allow us to evaluate nest distribution and density changes over time. Many areas had excellent nest production; the estimated nest count of 64,345 again reflected good habitat conditions.

5. West Nile Virus: LDWF, in conjunction with LSU School of Veterinary Medicine, continues to monitor occurrence of West Nile Virus on alligator farms in Louisiana. Initial mortality related to West Nile Virus occurred in fall/winter 2003. Aggressive mosquito control on farms has reduced on farm mosquito populations and seems to have reduced the incidence of West Nile Virus in recent years. During FY 2021-2022, we continued to have expertise from staff at the LSU School of Veterinary Medicine available if needed to collect samples from farm alligators to monitor for any health concerns, provide diagnostics as needed, and assist with other health surveillance parameters. After several years of research, development, and testing, a West Nile Virus vaccine was developed, gained conditional approval by the USDA and became available to farmers in October 2011. Several farmers have taken advantage of this new proactive technology to prevent West Nile Virus in captive hatchling and yearling alligators.

6. Best Management Practices - The LDWF and the LSU School of Veterinary Medicine, in conjunction with the Louisiana Alligator Farmers and Ranchers Association, developed a document entitled "Best Management Practices for Louisiana Alligator Farming." The document was distributed in June 2011 and details recommended practices to ensure animal welfare of captive reared alligators in Louisiana, including egg collection, hatching, rearing, release to the wild and euthanasia. This document was updated and distributed in January 2013, again in January 2016, and most recently in January 2022. It will continue being updated as new information pertinent to alligator farming becomes available. The intent of this document is to ensure that licensed alligator farms/ranches are employing humane methods of working with alligators. Through industry contributions, Dr. Javier Nevarez at LSU's School of Veterinary Medicine has continued to work with LDWF staff to update Best Management Practices as needed. This has been even more important recently with international recognition of animal welfare concerns on crocodilian farms worldwide.

7. Alligator Research Facility - After several years of planning and fund raising by industry personnel, construction began on an alligator research facility at LSU's AgCenter Aquaculture Research Station. Funding for facility construction was provided purely by monetary donations from alligator industry participants including alligator farmers, wetland landowners, tanners, feed manufacturers, alligator hunters and other interested parties. The building is available to house alligators of various sizes for projects related to all phases of alligator husbandry. LDWF staff has worked closely with alligator producers and feed manufacturers to provide input to identify and prioritize research goals and secure long term funding sources for facility operation. The LSU AgCenter has established an Alligator Research Fund to receive additional donations for funding various research projects. Hatchlings were provided to Dr. Robert Reigh in August 2021 by LDWF from eggs collected and incubated at Rockefeller Wildlife Refuge for continued nutrition studies to benefit the alligator farming industry; various diets and feeding regimes are tested and findings disseminated to industry personnel at meetings throughout the year or through publications in the scientific literature.

CONTRACTS

1. Diagnostic Services (LSU School of Veterinary Medicine - Dr. Javier Nevarez) - Dr. Javier Nevarez is contracted to provide diagnostic services as needed for the alligator industry. Farmers may consult with Dr. Nevarez at any time for assistance with any alligator husbandry or disease issue. Our staff often assists with logistics and transport of alligators/samples to the LSU School of Veterinary Medicine in Baton Rouge for evaluation. Periodic health surveillance of farm released alligators is conducted to monitor health status of farm alligators released to the wild; a manuscript on these findings is being prepared. Dr. Nevarez and colleagues worked with LDWF

to evaluate possible culture of Chlamydia and Mycoplasma from wild and captive (farm-releases) alligators in 2020; the samples were held until all were collected so the samples could be analyzed more efficiently in a large batch analysis. This project was expanded markedly in 2021, and we provided alligator eggs, embryos and nesting media to culture for Chlamydia. At the request of alligator industry members to increase the sample size of the project, we initiated sampling of farm juveniles and hatchlings (imported and native Louisiana) for Chlamydia in the summer of 2021, a report on the findings from this project is being prepared.

2. Health Monitoring (LSU School of Veterinary Medicine - Dr. Javier Nevarez) - Dr. Javier Nevarez has been instrumental in providing guidance in evaluating concerns over possible disease introduction from alligators (predominantly hatchlings) imported from other southeastern states. Concerns are focused on Mycoplasma and Chlamydia. In 2021, we contracted with him to collect and analyze samples from imported hatchlings and additional wild alligators to survey for prevalence of these microorganisms, if present.

3. Nutrition Research (LSU AgCenter, Aquaculture Research Station) - A research contract was established for aquaculture nutritionist Dr. Robert Reigh and his research associate to conduct digestibility studies to continue to aid farmers in their farm management; industry support from feed manufactures at Cargill Inc. have been instrumental in this process. Research committee meetings are held periodically and projects are outlined for study. Current work is underway evaluating specific amino acid requirements and digestibility during grow-out.

OTHER RESEARCH

In addition to LDWF research studies, we continued to support and collaborate with graduate students, post-doctoral research associates, and university faculty with their research studies on numerous projects. Associates from several universities were hosted at Rockefeller Wildlife Refuge in 2021-2022 to collect additional samples for several studies, or we provided samples to them if travel costs were prohibitive. Several collaborators made presentations with LDWF staff as co-authors at meetings.

We published several abstracts and full papers this year. Staff organized and hosted a virtual meeting of the Southeast Association of Fish & Wildlife Agencies Alligator Working Group on Oct. 19, 2021. There was good participation by the southeastern states alligator biologists and a variety of topics were discussed and common problems addressed to improve our management programs. Topics included problems and possible solutions to issues encountered with CITES tag orders, Louisiana's updated regulations and best management practices, and an educational campaign to promote safety in alligator range states.

Research Manuscripts Published in 2021

Elsey, R. M., and S. G. Platt. 2021. *Alligator mississippiensis* (American alligator). Caruncle regression. Herp. Rev. 52(3):638 – 640.

Elsey, R. M., E. Ledet, B. Breland, and J. Day. 2021. *Alligator mississippiensis* (American alligator). Unusual nesting site. Herp. Rev. 52(3):640 - 641.

Elsey, R. M., and S. G. Platt. 2021. *Chelydra serpentina* (Snapping Turtle). Basking. Herp. Rev. 52(3):628.

Elsey, R. M. and S. G. Platt. 2021. Notes on the occurrence and reproductive ecology of an introduced population of *Apalone ferox* in coastal Louisiana, USA. Herpetological Review. 52(4):743 – 747.

Elsey, R. M., K. Nesvacil, and T. Tristan. 2021. Long-distance displacement of an American alligator (*Alligator mississippiensis*). Crocodile Specialist Group Newsletter. 40(3):10 - 12.

Elsey, R. M., S. Shipp, and S. G. Platt. 2021. *Apalone spinifera*. (Spiny Softshell). Color variation. Herp. Rev. 52(4):840-841.

Elsey, R. M. 2021. Alligator abode. Louisiana Conservationist. Winter 2021:7 - 10.

Elsey, R. M. 2021. Examining alligators. Louisiana Conservationist. Winter 2021:11 – 15.

Elsey, R. M. 2021. Possible hurricane mortality of *Alligator mississippiensis*. Crocodile Specialist Group Newsletter. 40(4):8 - 9.

Faulkner, P.C., R. M. Elsey, D. Hala, and L. H. Petersen. 2021. Correlations between environmental salinity levels, blood biochemistry parameters, and steroid hormones in wild juvenile American alligators (*Alligator mississippiensis*). Scientific reports. *https://doi.org/10.1038/s41598-021-94557-y*

Filogonio, R., B. D. Dubansky, B. H. Dubansky, T. Wang, R. M. Elsey, C. A. C. Leite, and D. A. Crossley, II. 2021. Arterial wall thickening normalizes arterial wall tension with growth in American alligators, *Alligator mississippiensis*. Journal of Comparative Physiology B. *https://doi.org/10.1007/s00360-021-01353-1*

Finger, J. W. Jr., M. D. Kelley, Y. Zhang, M. T. Hamilton, R. M. Elsey, M. T. Mendonca, and A. N. Kavazis. 2021. Antioxidant enzymes in destructible and non-destructible tissues in American alligators (*Alligator mississippiensis*). South American Journal of Herpetology. 20:33-41.

Finger, J. W. Jr., M. D. Kelley, Y. Zhang, M. T. Hamilton, R. M. Elsey, M. T. Mendonca, and A. Kavazis. 2021. Short-term capture stress and its effects on corticosterone levels and heat shock proteins in captive American alligators (*Alligator mississippiensis*). Canadian Journal of Zoology. 99:665 – 671. dx.doi.org/10.1139/cjz-2021-0014

Iijima, M., V. D. Munteanu, C. T. Kinsey, R. M. Elsey, and R. W. Blob. 2021. (Abstract). Ontogenetic changes in limb kinematics, forces, and joint movements in American alligators. PowerPoint presentation at the virtual SICB meeting January 2021.

Iijima, M., V. D. Munteanu, R. M. Elsey, and R. W. Blob. 2021. Ontogenetic changes in limb posture, kinematics, forces and joint movements in American alligators *Alligator mississippiensis*). Journal of Experimental Biology (2021) 224, jeb242990. doi:10.1242/jeb.242990

Mendyk, R. W., R. M. Elsey, D. Fleitas, and A. Meyer. 2021. Audubon Nature Institute's white alligators. Herpetological Review. 52(1):194-203.

Ochoa, A., R. M. Elsey, and J. Eme. 2021. (Abstract). Effects of egg mass, hatchling size, and clutch on growth of female American alligators (*Alligator mississippiensis*). Poster presentation at the Experimental Biology meetings, April 27-30, 2021.

Rose, K. A. R., P. G. Tickle, R. M. Elsey, W. L. Sellers, D. A. Crossley, II, and J. R. Codd. 2021. Scaling of axial muscle architecture in juvenile *Alligator mississippiensis* reveals an enhanced performance capacity of accessory breathing mechanisms. Journal of Anatomy. doi: 10.1111/joa.13523.

We also have several manuscripts currently in press or in review; and we serve as manuscript reviewers for multiple scientific journals and review numerous manuscripts each year.

ALLIGATOR ADVISORY COUNCIL

The Alligator Advisory Council is responsible for reviewing and approving recommended marketing, research and educational programs funded through the Alligator Resource Fund. The Alligator Advisory Council monitors and addresses numerous issues affecting the alligator industry at local, national and international levels. The council supports husbandry and disease research through LSU AgCenter, addresses public concerns regarding animal welfare through media and education, engages in international conservation and trade issues, carefully monitors local and national legislation that may impact wildlife management, and communicates with designers and manufacturers to promote the use of sustainable Louisiana products.

LDWF administrative and biological staff participated in several international conservation groups including the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Crocodile Specialist Group, and the International Union for Conservation of Nature. The department and council's participation in these groups continues to provide a strong foundation for sustainable international trade.

The Alligator Advisory Council has continued to interface with the public through local events such as Ocean Commotion, Louisiana Envirothon, 4-H events and library presentations. The council engaged in multiple K-12 science focused events and a number of summer educational camps. Department staff also presented at school-wide events with Louisiana themes. The council website carried the educational story to a much broader audience (*www.louisianaalligators.com*).

The following list provides a summary of the various issues and projects the Alligator Advisory Council supported with the use of contractors to address during FY 2021-2022.

CONTRACTS

MONARCH MARKETING

LDWF contracted with Monarch Marketing to assist with technical representation at national and international meetings involving wildlife trade issues. LDWF staff and Monarch Marketing grew alliances within CITES, Crocodile Specialist Group and International Union for Conservation of Nature. Monarch Marketing attended both virtual and in-person CITES Standing Committee and Animals Committee Meetings where major topics such as zoonotic disease, wildlife trade, and a global electronic CITES permitting system were discussed. Monarch Marketing presented at several major international fashion forums including Lineapelle in Milan, Italy in February 2022 and with the Accessories Council of New York in June 2022. The topics were sustainability in the fashion industry and how the use of exotic leather and particularly Louisiana alligator leather benefitted local communities, conservation of habitats and species and provided nature-based solutions to climate change through wetlands restoration. Along with LDWF staff, Monarch Marketing coordinated with industry members to investigate possible solutions to a variety of issues affecting the alligator industry, including wild alligator market challenges and international shipping delays. Monarch Marketing maintained a social media presence to promote Louisiana alligators, share relevant sustainable use articles, and work with tanneries, designers, manufacturers and retailers to encourage positive messaging.

WORLD CONSERVATION AND MONITORING CENTER

LDWF contracted with the World Conservation and Monitoring Center to develop the International Alligator and Crocodile Trade Study report. This report has been funded since 1988 to monitor world trade in all crocodilians and to increase accountability of sustainable management practices.

GLENN R. DELANEY

LDWF contracted with Glenn Delaney to monitor legislation in Washington D.C. that may impact Louisiana's alligator management program. Glenn Delaney works closely with the Louisiana delegation to educate them on issues important to LDWF and the Alligator Advisory Council. Notable legislation that Mr. Delaney has provided expert analyses on include the Refuge from Cruel Trapping Act and the Preventing Future Pandemics Act. Both of these contain provisions that attempt to undermine the principles of sustainable use and impose global bans on legitimate wildlife trade. Mr. Delaney has also helped seek funding to benefit a variety of Louisiana wildlife management programs including work to secure FY23 Senate Appropriations to further develop a CITES "ePermitting" system that will better facilitate wildlife trade in Louisiana. Mr. Delaney continued to work with Louisiana Senators to pursue funding for research on infectious diseases affecting Louisiana alligator farms and its wild alligator population in the FY 2021-2022 appropriations cycle. Although a specific funding amount has yet to be appropriated for this research, the Senate Appropriations Committee has called on the USDA's Animal and Plant Health Inspection Service to develop a critical strategy for addressing these threats.

NATIONAL ASSEMBLY OF SPORTSMEN'S CAUCUSES

The Alligator Advisory Council and LDWF sponsored the 18th Annual National Assembly of Sportsmen's Caucuses Sportsman-Legislator Summit. The National Assembly of Sportsmen's Caucuses is the largest non-partisan caucus in the country whose goal is to advance hunting, fishing, and conservation of wildlife. Each year, legislators, governors, and wildlife directors from all over the United States attend the summit to gain education on important topics for advancing conservation. The caucuses this year were held in Little Rock, Arkansas.

EDUCATION PROGRAM

Conservation education is a vital part of the LDWF mission. The Education Program focuses on two main areas: Hunter Education and General Wildlife Education/Outdoor Skill Development.

Staffing for the Education Program consists of nine biologists who work in the field, four supervisors who have field responsibility in addition to their supervisory duties, two education biologist managers, and one education program manager. Three full time technicians staff LDWF-operated shooting ranges.

HUNTER EDUCATION

Hunter and bow-hunter education classes cover firearm safety and operation, hunting ethics, principles of wildlife management, outdoor survival and tree-stand safety. Hunter education certification is mandatory for hunters born on or after Sept. 1, 1969. There are exceptions to the hunter education requirement that allow persons to hunt without hunter education certification if they are directly supervised by someone 18 or older with hunter education certification or by a licensed hunter born prior to Sept. 1, 1969. An exemption is also provided for persons with a current POST certification or military experience, and a hunter education exemption card is issued to those who qualify. Most states have mandatory hunter education requirements, and these exemptions, including the POST/military exemption, apply only in Louisiana. The regular Louisiana hunter education certification card is honored in all 50 states.

Students have three options for taking a hunter education class. The classroom course consists of 10 hours of instruction, usually spread over two to three days. The blended format consists of an internet course that the student can complete at home and is followed by a mandatory four-to-six-hour field day event. The field day reinforces the lessons learned in the online course and provides an opportunity for hands-on learning. The third option allows students 16 and above to obtain their hunter education certification solely through the internet course. Both the classroom course and the online/field day include a live-fire exercise where students must demonstrate that they can safely handle and discharge a firearm. The online-only option does not have any in-person or live-fire requirements. The online–only option is open to both residents and non-residents.

Hunter education classes are taught by Education Program staff and a network of volunteer instructors. There are approximately 785 active volunteer hunter education instructors in Louisiana. Volunteer instructors complete an instructor training course and background check prior to being certified. Education Program staff coordinate the delivery of classes with volunteers, recruit and train volunteer instructors and keep volunteer instructors supplied with materials to teach classes. In all, 269 new volunteer instructors and range safety officers were trained through 30 instructor courses. The annual volunteer instructor workshop was held at Camp Grant Walker with 72 instructors attending. The time volunteered by hunter education instructors, volunteer range officers, and Archery in Louisiana Schools coaches to deliver hunter education classes, shooting range operation and to train archers is used as in-kind match for the hunter education federal grant. In FY 2021-2022, volunteers contributed 32,127 hours of service time valued at approximately $1.25 million.

STUDENT CERTIFICATION

Total hunter education certifications increased slightly from last fiscal year (8,366 in FY 2021-2022 versus 7,925 in FY 2020-2021). The availability of the online-only certification option likely helped to increase these numbers. Similar to last year, increased focus was placed on offering field days in order to minimize public exposure time in classroom settings; however, many field day classes were cancelled due to lack of student participation. In-person classroom courses saw the greatest percentage of student attendance. With the online-only certification option available for an entire year, this new option for those 16 and above was incredibly popular and represented 37.5% of total certifications.

Hunter Education

LA Hunter Education Courses FY 2020-2021			
Course Type	No. of Courses	No. of Students	Percentile
Classroom Course	211	4013	48%
Home Study/ Field Day	106	1235	14.5%
Online-Only	N/A	3,118	37.5%
Total	***337***	***8,366***	

Bowhunter Education

One bow-hunter education class was offered, with one student certified.

HUNTING INCIDENTS

During FY 2021-2022, there were seven reported hunting incidents involving injury or death. One of the seven resulted in fatalities. Two incidents involved falling from an elevated stand and the remainder involved firearms. Incidents were compiled and entered into the International Hunter Education Incident Database. Information on these incidents were provided to Hunter Education Instructors. Education Program staff and volunteer instructors are placing additional emphasis on tree-stand safety in their hunter education classes and field days. Additionally, per legislative request, LDWF developed and disseminated tree-stand safety materials through print, website and social media again this year.

Primary causes for these incidents are shown below.

Hunting Incidents (FY 2020-2021)	
Type	No. of Incidents
Careless Handling of Firearm	1
Failure to Check Beyond Target	3
Failure to Identify Target	1
Fall from Stand	2
Total Incidents	***7***

SHOOTING RANGE/ TRAINING FACILITIES

Two education centers and four shooting ranges are available to the public and managed by the LDWF Education Program. In FY 2020-2021, approximately 32,776 user visits occurred on LDWF shooting ranges. Planned Renovations were completed on three ranges, initiated on a fourth, and three planned projects were cancelled or postponed due to cost/benefit considerations.

BODCAU SHOOTING RANGE

The Bodcau range is located in Bossier Parish on the Bodcau WMA. Accommodations for public use include 5 200 yard, and 13 100 yard rifle and 18 (25 yard) pistol shooting positions and a shotgun range with four manual clay target throwers. The range is open to the public three days a week and recorded 5,751

user visits in FY 2021-2022. The rifle range was modified to address safety concerns. Renovation of this range was initiated in May 2022 with completion scheduled for late summer FY 2022-2023.

WOODWORTH EDUCATION CENTER

The Woodworth Education Center located in Rapides Parish contains a classroom, lodging facilities and a public shooting range. Range facilities consist of a rifle range, handgun range and a five-stand shotgun range. The range is open for public access three days a week, and recorded 6,597 user visits in FY 2021-2022. Planned renovation of this facility was completed. Work conducted included; renovation of side and backstop berms, relocation of pistol backstop berm, installation of safety wall between rifle and pistol ranges, drainage modifications to reduce ponding, installation of sound reduction materials on pistol range, expansion of customer parking, and installation of concrete disabled parking spaces on both rifle and pistol ranges.

SHERBURNE SHOOTING RANGE

Located in Pointe Coupee Parish on the Sherburne WMA, the Sherburne range consists of two shotgun ranges, one archery range, one handgun range and one rifle range. It is open to the public six days per week and recorded 5,862 user visits in FY 2021-2022. Planned renovation of this facility was completed. Work conducted included; renovation and expansion of side and backstop berms, installation of side berm on rifle range, installation of concrete sidewalks, clearing and grubbing shot-fall zones on shotgun ranges, residing skeet houses, expansion of customer parking, and installation of concrete disabled parking spaces on both rifle and pistol ranges.

WADDILL OUTDOOR EDUCATION CENTER AND REFUGE

The Waddill Outdoor Education Center and Refuge in East Baton Rouge Parish provides an outdoor education environment in an urban setting. A classroom, shotgun range, archery range and air rifle range are used for hunter education instruction and recreational shooting opportunities. Waddill Refuge recorded 4.402 user visits in FY 21-22.

HONEY ISLAND SHOOTING RANGE

The Honey Island Shooting range is located on the Pearl River WMA in St. Tammany Parish. The range is managed under an agreement with Southeast Louisiana Firearms Safety, Inc (SELFS). SELFS is a non-profit organization staffed by volunteers that maintains and operates the range for public use. Shotgun, rifle and handgun shooting opportunities are available to the public. The range is open to the public three days per week. There is a $6 per day fee to use the range that is collected by SELFS to fund operation and maintenance of the range. This range recorded 10,164 user visits in FY 2021-2022. Planned renovation of this facility was completed. Work conducted included; renovation of side and backstop berms, installation of side berms on pistol range, installation of safety wall between rifle and pistol ranges, drainage modifications to reduce ponding, installation of sound reduction materials on rifle range, expand existing customer parking, and gravel access road resurfacing/grading.

GENERAL WILDLIFE EDUCATION AND OUTDOOR SKILL DEVELOPMENT

Education Program staff are involved in a variety hunter education related activities. Staff provide information and make presentations on topics of interest to civic organizations, school groups and others. Outdoor skill development programs and efforts have increased in recent years. Demand is high for programs that teach beginners about getting started in hunting and shooting sports. In recognition that funding and support for conservation are directly linked to hunters and shooters, the LDWF Education Program has expanded its efforts to recruit and teach skills to new outdoor enthusiasts.

NATIONAL HUNTING AND FISHING DAY

The general public is invited to join LDWF and other conservation partners in an open house atmosphere that involves hands-on activities and information about conservation. All LDWF Hunting and Fishing Day events were cancelled in 2021 due to COVID-19 concerns.

BECOMING AN OUTDOORS WOMAN (BOW)

BOW is a popular program with women interested in learning about outdoor recreation. During the BOW weekend workshop, education staff and volunteers conduct classes on a variety of outdoor skills, including shooting, fishing, canoeing, hunting, orienteering, camping and wildlife appreciation. The BOW workshop was cancelled due to extensive damages to Camp Grant Walker from Hurricane Laura; however, nine Mini-Becoming an Outdoors Women (BOW) classes were taught statewide reaching 132 participants. These classes included Archery (2), Waterfowl, Falconry, Handguns, Shotguns, Camping Skills, Deer Hunting, and Trapping. The three-day Beyond BOW Deer hunt was cancelled due to COVID-19 concerns.

FAMILIES UNDERSTANDING NATURE (FUN) CAMP

Families Understanding Nature provides both fun and education to a parent and youth(s) through a weekend of staff-led outdoor activities. Family members are introduced to archery, rifle and shotgun shooting, kayaking and camping. One FUN Camp was implemented at Woodworth Education Center reaching 18 participants.

HUNTING 101 WORKSHOPS

Hunting Introductory (101) workshops are being developed by Education staff to give beginning hunters the knowledge and confidence to begin hunting on their own. Two hunting 101 workshops have been developed and implemented; Wood Duck 101 and Squirrel Hunting 101. In FY 2021-2022, 30 students were instructed at Waddill Refuge.

ARCHERY IN LOUISIANA SCHOOLS (ALAS)

ALAS is Louisiana's version of the National Archery in the Schools Program. ALAS promotes international style target archery as part of the physical education curriculum for grades 4-12. At the end of FY 2021-2022, 122 active schools were participating in the program, impacting 16,300 students. LDWF hosted two regional tournaments, a state 3D, and a state bullseye tournament. A total of 1347 archers participated in regionals from a combined 65 schools. The 3D tournament continued its growth with 667 archers from 33 schools. The state bullseye tournament had 1,294 archers from 65 schools across the state.

LEFT: *Mini-BOW camping class.* ***RIGHT:*** *2022 Archery in Louisiana Schools (ALAS) state tournament.*

RIGHT: *Mini-BOW Life of a Fur Trader class*

LEFT: *Conservation education at Waddill Refuge.* ***CENTER & RIGHT:*** *Mini-BOW archery class.*

HABITAT

The objectives of the Habitat Section are to gather and compile data on fish and wildlife resources, determine the requirements for conserving the resources, and provide information to governmental agencies, nongovernmental organizations and the public. Data are also gathered on the potential impacts of human activities on the resources. These data and technical assistance are provided to regulators, planners and decision-makers in advance of execution of projects in order to avoid, minimize and/or mitigate any adverse environmental impacts. The Habitat Section is comprised of the four following programs: Statewide Environmental Investigations, Louisiana Natural and Scenic Rivers Program, Permits Coordination, and Seismic Section.

STATEWIDE ENVIRONMENTAL INVESTIGATIONS

PERMIT REVIEW AND COMMENT - LDNR & USACE

Statewide Environmental Investigations is authorized under the Fish and Wildlife Coordination Act and is partially funded by a USFWS grant. Staff is responsible for reviewing and providing comments and mitigation recommendations on all permits sought from state and federal environmental regulatory agencies, primarily LDNR and USACE. Staff members reviewed and provided comments to 1,357 state and federal permit applications during FY 2021-2022 (*Figure 4*). Written comments and recommendations aimed at avoiding, minimizing and/or mitigating adverse impacts were issued by LDWF for all state and federal permit applications received.

Staff continued to receive a number of USACE Section 10 permit applications for the withdrawal of surface water classified as waters of the United States. These water withdrawal requests were primarily for hydraulic fracturing of shale formations. LDWF responded to all such permit requests with recommendations on how to conduct these substantial water withdrawals while also avoiding adverse impacts to fish and wildlife resources. A total of approximately 29 such permits were issued during FY 2021-2022.

In addition to permit review, staff participated in permit site inspections and habitat evaluations, provided technical assistance to the public on wetland issues, and worked with private developers and consultants involved in the regulatory process. During FY 2021-2022, staff conducted several on-site field inspections and participated in multiple meetings and conference calls with applicants, agents and regulatory agency personnel. Staff gave presentations to non-governmental organizations, state agencies and user groups.

Staff members also represented the agency on two Mitigation Bank Interagency Review Teams chaired separately by the USACE Vicksburg and New Orleans districts. The purpose of the Interagency Review Teams is to provide regulatory review, approval and oversight of wetlands mitigation banks. During FY 2021-2022, staff evaluated, inspected and provided technical comments and recommendations on dozens of wetlands mitigation banking proposals, mitigation banking instruments and mitigation banking monitoring plans. Six new wetland mitigation banks were approved and authorized in Louisiana during FY 2021-2022. Staff attended all Interagency Review Team meetings, including 22 site investigations.

Staff continued to provide technical assistance to USACE related to several large- and small-scale maintenance dredging projects, beneficial use projects, flood control projects, and navigation projects being undertaken by the New Orleans and Vicksburg Districts. As Bipartisan Budget Act 2018 (BBA 18) project planning progressed, Habitat Section staff remained abreast of developments and supplied comments and recommendations to several USACE led project development teams.

Statewide Environmental Investigations also assisted in protecting all lessees of private oyster grounds by reviewing and approving, sometimes with modification, water bottom assessments submitted by project applicants prior to the initiation of activities affecting state water bottoms under lease to private parties for oyster production. Coastal Use Permit applicants can be required at the request of Statewide Environmental Investigations staff to modify the activity if the proposed project unnecessarily impacts oyster resources. There were 25 water bottom assessments reviewed and approved by staff during FY 2021-2022.

PROJECTS OF OTHER AGENCIES AND THE PRIVATE SECTOR

LDWF worked with numerous governmental agencies in conducting environmental investigations including:

- USFWS
- National Marine Fisheries Service
- U.S. Environmental Protection Agency
- USACE: Fort Worth, Galveston, New Orleans, and Vicksburg Districts
- U.S. Forest Service
- U.S. Department of Agriculture
- Federal Highway Administration
- Federal Aviation Administration
- U.S. Coast Guard
- Department of Energy
- Federal Energy Regulatory Commission
- Department of Defense
- National Park Service
- Louisiana Department of Transportation and Development
- Louisiana Department of Natural Resources
- Louisiana Department of Environmental Quality

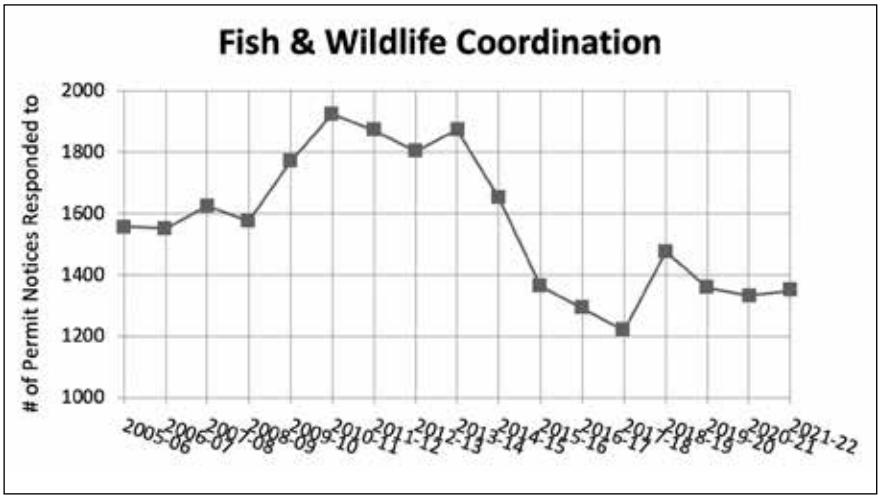


FIGURE 4. *Number of permit notices responded to from 2005-2022.*

- Louisiana Department of Culture, Recreation and Tourism
- Louisiana National Guard
- Louisiana Division of Administration - Office of Community Development

LOUISIANA NATURAL AND SCENIC RIVERS PROGRAM

The Scenic Rivers Program is charged with the administration of the Louisiana Natural and Scenic Rivers Act. The act requires that LDWF, through the Scenic Rivers Coordinator, administer a permitting system for activities that have potential for significant ecological impact to designated Natural and Scenic Rivers, as well as a system of monitoring, surveillance, investigation and enforcement for the purpose of ensuring compliance with the act. The act, and the rules and regulations promulgated under its authority, provide for the development of management plans, stream surveys and enforcement. There are currently approximately 80 streams and/or stream segments in the system constituting an estimated 3,100 linear miles of Louisiana's streams, rivers and bayous.

One enforcement action was initiated in FY 2021-2022. This also included an issuance of a Compliance Order. No citation requests for a violation of the Scenic Rivers Act were sent to LDWF's Enforcement Division. The coordinator and staff, through routine surveillance, project inspections and response to complaints, ensured compliance with permit conditions, utilization of adequate best management practices, and appropriate cleanup and restoration of permitted project sites. Staff continued to monitor numerous sand and gravel operations as to insure that previous water management plans and riparian buffers aimed at minimizing impacts to Scenic Rivers were implemented. Scenic River's staff also coordinated closely with the Louisiana Department of Environmental Quality, to address some of the construction site stormwater and sanitary issues impacting several system streams.

Staff made 70 site investigations and surveyed over 143 miles of streams. During surveys, Scenic River staff noted potential violations and compliance issues. Staff also continued efforts to document derelict vessels, attempted to locate responsible parties and have the vessels removed by whichever means prudent.

A total of 48 Scenic River Permits were issued during FY 2021-2022. In addition to considering permits, the Scenic Rivers staff made 26 determinations of "no permit required" for activities undertaken near Scenic Rivers but with no potential to significantly degrade the ecological integrity of a Scenic River. Staff held 31 meetings and conference calls with applicants and agents, specific to Scenic River issues. The coordinator and staff maintained regular contact with both state and federal agencies to ensure that designated Scenic Rivers were considered in all levels of planning and permitting, which required working closely with city planners, police juries, mayors and local interest groups and organizations throughout the state.

PERMITS COORDINATION

The purpose of the Permits Coordination Program is to ensure that LDWF receives, reviews and responds to and distributes comments and mitigation recommendations on all permit notices received from state and federal environmental regulatory agencies in an efficient and timely manner (i.e. prior to public notice comment period deadlines). LDWF's written comments are in-turn used by the regulatory agencies to make final determinations on how to best avoid, minimize and/or mitigate adverse impacts to fish and wildlife resources.

In order to accomplish this task, the LDWF permits coordinator serves as the primary liaison and "single point of contact" for all regulatory agencies, primarily LDNR and USACE. It is the responsibility of the permits coordinator to ensure that the LDWF biologist with the appropriate authority and expertise is included in the formulation of written comments and mitigation recommendations. The permits coordinator also ensures that there is adequate LDWF representation at all LDNR Geologic Review and pre-application meetings.

The permits coordinator also utilizes, maintains and populates a comprehensive searchable database for all permit notices. This database is of critical importance to ensure a timely response from LDWF. The database also archives LDWF's formal response to all permit notices dating back to 2006. During FY 2021-2022, the permits coordinator received, processed, tracked and disseminated 1,349 permit notices.

SEISMIC SECTION

The LDWF Seismic Section was created in 1939 specifically to protect fish, oysters, shrimp, wildlife and other areas of concern from the effects of seismic exploration. Seismic exploration uses energy waves to generate a profile of sub-surface reflective layers that help define potential oil and gas traps. The energy waves can be produced by explosives detonated below the ground, by air guns that emit a burst of air at the surface of water bodies, by large vibrating pads placed on the surface, or other means. These projects can occur in sensitive wetlands, water bodies and other habitats.

LDWF performs a Natural Heritage Review on each individual seismic job to determine the presence of rare, threatened and endangered species and other areas of conservation concern. The Wildlife Diversity Review includes specific conditions that the applicant must adhere to for the protection of such resources. LDWF Seismic agents also monitor geophysical activities to protect Louisiana's fish and wildlife resources by ensuring compliance with LDWF seismic rules and regulations.

Some of the Seismic Section's Accomplishments for FY 2021-22 are:

- Staff issued two seismic permits throughout the state
- Three internal meetings were held with Air Products prior to the commencement of the Lake Maurepas project
- Staff closely interacted with seismic companies to ensure compliance with the rules and regulations of the Seismic Section. Staff continued to field questions on conceptual proposals and past projects
- Staff continued to ensure protection of threatened and endangered species and other areas of concern. Two Natural Heritage Reviews were completed by staff

MINERALS MANAGEMENT

The Minerals Management Program, hereafter called Mineral Program, is responsible for ensuring that mineral activities on all LDWF properties are compatible with the environment and that such activities do not prevent LDWF from meeting WMA/refuge goals and objectives. In FY 2021-2022 Mineral Program staff reviewed, evaluated and authorized 23 well locations, pipeline projects and other mineral exploration related activities on LDWF properties. During FY 2021-2022, the program also issued 13 rights-of-way, surface leases and servitudes for oil and gas activities occurring on LDWF properties. All of these projects are reviewed and coordinated with field personnel to ensure that they are compatible with LDWF management area programs.

In FY 2021-2022 the Mineral Program continued to generate significant revenues for LDWF, which includes mineral royalties, rights-of-way, surface leases and seismic fees. The Mineral Program represented LDWF at each monthly meeting of the State Mineral and Energy Board. Mineral Program staff continues to work closely with other programs within LDWF and the LDNR Office of Coastal Management in an ongoing effort to streamline the Coastal Use Permitting process.

WETLAND MITIGATION BANKING

The Mineral Program continued to ensure regulatory compliance and coordinate credit sales for LDWF's wetland mitigation bank located on Rockefeller Wildlife Refuge in Cameron Parish. These restored wetland ecosystems, totaling more than 160 acres, functionally compensate unavoidable habitat impacts, such as those associated with oil and gas exploration and production, occurring within LDWF's WMA and refuge system.

DREDGE FILL PROGRAM

In addition to the above-mentioned duties, the Mineral Program has continued to administer LDWF's Dredge Fill Program. This program issued 60 licenses in FY 2021-2022 for the dredging and severing of state water bottoms. This program also collects approximately $1 million in annual severance royalties associated with dredging and severing state water bottoms. In FY 2021-2022 commercial dredge fill pits were inspected to ensure operator compliance with program regulations and LDWF also actively investigated unlicensed commercial pit operators.

PERMIT ACQUISITION

The Mineral Program applied for and received 11 USACE permits and nine LDNR Consistency Determinations that authorized LDWF to undertake management actions on LDWF properties statewide. All permit requests must also be coordinated with and approved by federal resource agencies (i.e., USFWS, Environmental Protection Agency and NOAA - National Marine Fisheries Service).

WATER RESOURCES

LDWF continued to serve on the Louisiana Water Resources Commission. The purpose of the commission is to develop a statewide water management plan for ground water and surface water use and conservation. Much of the focus of the initial plan was on ground water resources. The commission convened four times during FY 2021-2022 to receive reports on progress of implementing the recommendations of the initial plan. As the commission continues its work, LDWF's role will be to ensure that the conservation of fish, wildlife and their supporting habitats as well as outdoor recreation are an important consideration when making water management decisions.

RESTORATION PROGRAM

Program Manager - Jon J. Wiebe
Biologist Supervisor - Laura Carver
Biologist - Sadie Morgan
Biologist - Kacie Rome

OVERVIEW

LDWF's Restoration Program is responsible for the development and implementation of technically sound, effective restoration of the State of Louisiana's natural resources. Many of these restorative actions are the direct result of defensible biological and ecological injury assessment associated with statewide oil spills. Programmatic facets include: Oiled Wildlife Response, Natural Resource Damage Assessment and Restoration. 2010 *Deepwater Horizon* oil spill restoration activities exemplify LDWF's continued commitment towards resource protection and restoration associated with oil spills. LDWF personnel collected invaluable response information throughout the incident, played a critical role in determining resource injury, and now play an instrumental role in coastal habitat restoration. For FY 2021-2022, our program worked on the following 2010 *Deepwater Horizon* oil spill restoration activities:

- Construction and engineering and design for historical colonial waterbird colonies, large-scale marsh creation projects and coastwide recreational-use projects.
- Implementing adaptive management activities with the intention of enhancing or increasing project-based benefits
- Addressing critical informational needs that will inform construction of preferential avian habitats as well as means to determine associated restoration benefits.

Collectively, these activities were accomplished in large part through strong collaborations amongst LDWF programs, CPRA and the Louisiana and Region-wide Technical Implementation Groups; the principal means by which state and federal trustees implement 2010 *Deepwater Horizon* oil spill restoration within the state of Louisiana and the broader northern Gulf of Mexico.

OILED WILDLIFE RESPONSE

LDWF's Restoration Program monitors and responds to reports of oil spills throughout Louisiana. During FY 2021-2022 our program received 10,450 oil spill reports from the principal reporting agencies, National Response Center and Louisiana State Police. These reports encompass a broad array of potential situations where volume reported may not be indicative of the overall resource injury. Program personnel carefully reviewed each of these reports so as to assess potential impacts to the state's wildlife and sensitive habitats.

Many of these spills required multiple and detailed site visits over several months to ensure complete injury documentation and cleanup oversight. Personnel led by Program Response Lead Laura Carver performed regimented evaluations of injury to wildlife and associated habitats. Personnel documented and recovered live, oiled wildlife for rehabilitation and subsequent release as well as wildlife killed during the incident. Of note, several spills required extensive assistance from select LDWF Office of Wildlife (Coastal and Nongame Resources and Wildlife Divisions) and Office of Fisheries personnel certified in Hazardous Waste Operations and Emergency Response (HAZWOPER).

REPRESENTATIVE SPILLS (FY 2021-2022)

The spills listed in Table 7 and other spills presented many unique challenges during FY 2021-2022. LDWF's ability to effectively and safely engage on these and other spill-related issues stems from a commitment that personnel maintain HAZWOPER certification and reinforcing these training principles among partner agencies (e.g., Unified Response Drills and Planning Sessions). Collectively, this as well as stepwise implementation of wildlife response activities has been memorialized within LDWF's Oiled Wildlife Response Plan

Collins Pipeline MRGO oil spill.

TABLE 7. Representative Spills (FY 2021-2022)

SPILL DATE	NRC#	LSP#	SPILL NAME	RESPONSIBLE PARTY NAME
6/14/2021	1307738	21-02509	Charenton Field	Destin Operating
6/21/2021	1308330	21-02621	Black Lake Well#57&173	TPIC
6/22/2021	1308546	21-02648	Bayou Wikoff	R&B Oil
6/25/2021	1308822	21-02705	Catfish LakeTB-7	TPIC
6/29/2021	1309137	21-02744	Manilla Field	Wapiti Operating
7/1/2021	1309418	21-02802	Bully Camp	Red Rock Energy
7/10/2021	1310321	21-02947	South Pass#24 BLD-U8	TPIC
7/29/2021	1312147	21-03303	Bayou Lafourche	Perdido Energy
8/14/2021	1313827	21-03650	Cameron Parish #3495	Cox Operating
8/30/2021	1315193	21-04251	Cutoff-LOOP	Shell Pipeline
8/31/2021	1315265	21-03985	Central Crude Facility	TPIC
8/31/2021	1315405	21-04035	Alliance Refinery	Phillips 66
9/2/2021	1315566	21-04068	Bayou Couba	American Natural Energy
10/18/2021	1319736	21-05300	Lake Washington BL	Hilcorp Energy
11/14/2021	1321958	21-05869	Timbalier Bay-Tank	S2 Energy
11/15/2021	1322036	21-05887	Timbalier Bay-Gas Well	S2 Energy
12/10/2021	1324259	N/A	Harvey Canal Drum	Unknown
12/22/2021	1325107	21-06540	Weeks Island-Scrubber	TPIC
12/27/2021	1325365	21-06592	MRGO	Collins Pipeline
1/3/2022	1325785	22-00020	South Pass #11	Whitney Oil & Gas
1/20/2022	N/A	22-00372	Nebo	XTO Energy
1/22/2022	1327104	22-00410	Lake Barre-Lake Hatch	Whitney Oil & Gas
1/23/2022	1327117	22-00413	Garden Island Bay	Whitney Oil & Gas
1/26/2022	1327931	22-00621	Lake Lery	Energy Properties
2/4/2022	1328075	22-00651	Mud Lake	LLOX
2/8/2022	N/A	22-00730	Charenton	TPIC
2/14/2022	1328865	22-00877	East Cameron #9	Orphaned Well
2/15/2022	1328951	22-00878	Catfish Lake-Golden Meadow	TPIC
2/25/2022	1329700	22-01072	West Delta #73	Cox Operating
2/28/2022	1329895	22-01102	Cameron Meadows Well#45	Apollo Energy
3/2/2022	N/A	22-01134	Boyce	Unkn.
3/24/2022	1331840	22-01553	Well #10	Apollo Energy
4/21/2022	1334114	22-02094	East Bay Well #40	Whitney Oil & Gas
5/2/2022	1334944	22-02303	Bayou Queue De Tortue	Daylight Petroleum
5/2/2022	N/A	22-02318	Little Cash Bayou	CTR Oil
5/5/2022	1335175	22-02395	Grand Lake	Perdido Energy
5/9/2022	1335511	22-02477	Black Lake-Hackberry	TPIC
5/21/2022	1336802	22-02742	Jena-Kitterlin Creek	XTO Energy
6/19/2022	1339200	22-03321	Arpent Canal	Valero
7/1/2022	1340284	22-03589	Main Pass#69	Third Coast Midstream

TABLE 8. Natural Resource Damage Assessment Case Summary

RESTORATION ACTIVITIES	CURRENT	LEGACY
ACL Gretna-MS River / DM-932 Status: Project Identification	Hilcorp Bay St. Elaine Status: Settlement Discussions	ExxonMobil Torbert Status: Settlement Discussions
Citgo Calcasieu River Status: Project Identification	Hilcorp Rattlesnake Bayou & Hilcorp Bay Long Status: Injury Assessment	Whitney Oil & Gas Garden Island Bay Area of Concern (AOC) Status: Remediation Planning and Permitting
LWMIWCB Status: Project Identification	Collins Pipeline MRGO Status: Injury Assessment	
Shell Green Canyon Status: Project Identification		
Sunoco Logistics Mooringsport Status: Project Identification		
Taylor Energy Status: Project Identification		

Phillips 66 Alliance Refinery oil spill.

and Field Guide. In total, wildlife and habitat information generated from LDWF Restoration Program's wildlife response activities continues to be an invaluable resource towards the development of both comprehensive natural resource injury assessment and representative future restoration.

NATURAL RESOURCE DAMAGE ASSESSMENT ACTIVITIES

Within FY 2021-2022, LDWF's Restoration Program continues to make concerted efforts involving current and legacy (i.e., incident occurred greater than 10 years ago) Natural Resource Damage Assessment case management.

CASE MANAGEMENT OF CURRENT AND LEGACY NATURAL RESOURCE DAMAGE ASSESSMENT CASES

Program personnel spent extensive time and effort engaging with state and federal trustees on 15 current and legacy Natural Resource Damage Assessment case activities (*Table 8*). Much of these activities involved detailed data review (e.g., response and pre-assessment information) and technical resource analyses (e.g., Habitat Equivalency and Resource Equivalency Analyses) to quantify resource injury extent, as well as scale representative restoration.

DEEPWATER HORIZON RESTORATION

During the 2010 *Deepwater Horizon* oil spill, approximately 134 million barrels of oil and other substances were released into the Gulf of Mexico. Many of Louisiana's coastal resources were significantly impacted. As such, Louisiana factors prominently ($5 billion) in its ability to restore for these injured resources.

Within FY 2021-2022, our program's activities encompassed all project phases (engineering and design, construction, operation and maintenance and monitoring and adaptive management) in support of restoring the state's historic colonial waterbird colonies, large-scale marsh creation projects and coastwide recreational-use projects

ONGOING RESTORATION PROJECTS

QUEEN BESS ISLAND

Queen Bess Island has a rich and diverse history. LDWF utilized the island as one of its principal reintroduction localities for brown pelican, a species that was once extirpated from the state. Today, the island ranks as the third most productive breeding colony for the species, as well as providing critical historic nesting habitat for over 60 bird species. That stated, this island experienced expansive and repeated oiling events during the 2010 *Deepwater Horizon* oil spill, and significant direct and indirect bird losses and habitat damage associated with response activities. To that point, the island had less than 5 acres of suitable colonial waterbird nesting

***ABOVE:** Queen Bess vegetation growth. **BELOW:** Queen Bess beach creation.*

and brood-rearing habitat remaining. Restoration of Queen Bess Island was prioritized by LDWF within the Deepwater Horizon Louisiana Trustee Implementation Group Restoration Plan #1: Restoration of Wetlands, Coastal and Nearshore Habitats; Habitat Projects on Federally Managed Lands; and Birds (October 2016). Island construction was completed in February 2020, with 30 acres of shrub-nesting bird habitat and 7 acres of ground-nesting bird habitat.

Monitoring and Adaptive Management Plan

Louisiana Trustee Implementation Group developed the Monitoring and Adaptive Management Plan for the Queen Bess Island (BA-202) Restoration Project. The Monitoring and Adaptive Management Plan aims to identify activities that can be implemented to evaluate and document restoration project effectiveness or need for corrective actions. Designated Monitoring and Adaptive Management Plan activities includes colonial waterbird aerial nest surveys and nesting dotting efforts, brown pelican banding, vegetation surveys, vegetation species removal, invasive vegetation species removal, predator control, anthropogenic disturbance funds, and artificial nesting structures.

For FY 2021-2022, the project team implemented designated Monitoring and Adaptive Management Plan activity: colonial waterbird aerial nest surveys and nest dotting analyses. Brief overview provided below.

Colonial Waterbird Aerial Nest Surveys and Nest Dotting Analyses

As part of the Region-wide Trustee Implementation Group Monitoring and Adaptive Management Implementation Plan: Colonial Waterbird Monitoring, aerial photographs were acquired utilizing accepted methods (Ford 2010). Photos from May and June surveys were evaluated for their representation of peak breeding population size for each species at each colony. For most species, photos from May surveys represented peak breeding numbers and were selected for future analyses. For some species, especially black skimmer (*Rynchops niger*), photos from June surveys better represented peak numbers and were used for future analyses. Occasionally, especially for brown pelican (*Pelecanus occidentalis*), royal tern (*Thalasseus maximus*), and Sandwich tern (*Thalasseus sandvicensis*), well-developed colonies are counted using May photographs, but additional large nesting groups that form after the May survey will also be counted from June photographs and summed with May counts for a total number of nests.

Nest dotting analyses consisted of individual image inspection for clarity, location within the colony, and extent of colony coverage. Those best suited for nest counts based on those criteria and collectively comprising all areas photographed were analyzed using counting software (Image-Pro, Media Cybernetics®). Nests and birds were marked manually, and the software automatically tallied total counts for each category. Although the primary objective will be to determine number of nests, individual birds and chicks of each species were counted in each photo.

Additionally, unique symbol-color combinations were assigned to different nest and bird categories for each species. Where overlapping images were used to analyze portions of a colony, one or more lines were drawn on the selected image to delineate the area to be counted using that image. Areas outside any such lines were then be counted using different images. This process continued until the colony was counted completely with available photographs.

Assessing Colony Conditions

Each analyzed image was evaluated to characterize conditions at each colony. Factors that will be considered will include the following:

- **Stage of the Breeding Cycle** (e.g., early-, mid-, or late-incubation, early chick-rearing, etc.) for each species;
- **Habitat Occupancy** (numerical and geographic extent to which each species occupied the habitat);
- **Reproductive Performance** (e.g., pattern of abandonment, if any, chick production, etc.).

RABBIT ISLAND

Rabbit Island represents the only brown pelican colony in southwest Louisiana, and has historically provided essential nesting habitat for a number of species that were impacted by the 2010 *Deepwater Horizon* oil spill. According to LDWF's Wildlife Action Plan, the island also provides critical nesting habitat for 12 SGCN, including the reddish egret (*Egretta rufescens*) and American oystercatcher (*Haematopus palliates*). Historically, due to the islands low mean elevation (+1.01' NAVD88), nest inundation due to high water, is the leading source of colonial waterbird mortality. As such, restoration of Rabbit Island was prioritized by LDWF within Louisiana Trustee Implementation Group Restoration Plan #1: Restoration of Wetlands, Coastal, and Nearshore Habitats; Habitat Projects on Federally Managed Lands; and Birds (October 2016).

LDWF participated in all project phases (engineering and design, construction, performance monitoring). On June 2020, CPRA issued a Notice to Proceed with restoration to the awarded contractor (Weeks Marine). Island construction initiated in October 2020 and completed in March 2021. Contractor utilized dredge material from targeted locations within the adjoining Calcasieu Ship Channel. In total, 165 acres of avian habitats were created:

- Colonial Waterbird nesting (+5.0 – 1.6' NAVD 88): 81 acres
- Secretive Marshbird nesting (+1.5 – 1.0' NAVD 88): 21 acres
- Wading and Shorebird foraging: 63 acres.

Expansive native species plantings were installed to encourage targeted shrub and ground nesting bird opportunities. Further, these planting efforts greatly limited both project fill loss from wind as well as coastal erosion along the island's periphery.

Following construction, LDWF initiated formalized monthly avian surveys to document critical project endpoints (species present, individuals per species, nesting initiation and progression, general species distribution); an effort coordinated by Restoration Program biologist Sadie Morgan. Collectively, this information was utilized to evaluate the bird's willingness to both return as well as successfully nest on the newly restored island. This remains a pressing concern for LDWF. How will the birds receive and/or adapt to significant changes in the island's elevation, acreage, hydrology and vegetative composition? The answer is exceptional! Initial surveys documented the majority of brown pelican nesting within their historic habitat located at the island's southern extent. However, following three overwash events, pelicans collectively moved to the island's newly restored northern extent. Choosing elevation and hay bales (originally placed as an erosion control measure) as acceptable and, constructing many successful nests. Beyond brown pelicans, the island hosted an expansive array of avian species including nesting royal, sandwich, Caspian and gull-billed terns, black skimmer. Observed species include black tern, Wilson's pharelope, night herons, Godwit species, American avocet.

In tandem with formalized monthly avian surveys, LDWF resumed regimenting banding activities in late June 2020. Information from this activity provides broad insight into bird responses to recent restoration as well as project performance over time (individual resight as well as localized and/or regional immigration). Collectively, this information will inform future restoration project designs in support of further enhancing bird reproductive opportunities throughout coastal Louisiana and the broader northern Gulf of Mexico.

Project Timeline

LDWF and project partners are working on several project activities for FY 2021-2022. A living shoreline feature (currently in engineering and design) along with supplemental plantings will be installed in the island's N/NE island extent to limit ongoing shoreline erosion that directly threatens colonial waterbird nesting habitat. Additionally, this restoration feature will generate/enhance significant benefits for oysters and associated fisheries thereby achieving multi-resource benefits within an individual project; a central theme within the 2010 *Deepwater Horizon* oil spill restoration. Also, during the 2022 reproductive event (principally May and June), contractors documented (aerial surveys and nest dotting) the island's Year 1 colonial waterbird nesting performance.

BIRD'S FOOT DELTA HYDROLOGIC RESTORATION: ENGINEERING AND DESIGN

The Mississippi River Bird's Foot Delta remains one of North America's most unique and vibrant wetland habitats. Nowhere else does a shallow fresh riverine system mix with the deep saline waters of the continental shelf. The area maintains a unique assemblage of wildlife and fisheries species including freshwater and marine fisheries, migrato-

Ground nesting birds on Rabbit Island: terns (left) and black skimmer chick (right)

***ABOVE:** Shoreline erosion on Rabbit Island (with closeup on right). **RIGHT:** Vegetation on Rabbit Island.*

ry and resident birds, a unique blend of marine and freshwater reptiles, and marine mammals among others. Collectively, the Delta (approximately 165,000 acres) is managed by USFWS and LDWF. These agencies are charged with the implementation of wildlife conservation measures while ensuring the public access and opportunities to enjoy those same natural resources year-round.

The Mississippi River Bird's Foot Delta received another designation: the closest landmass to the 2010 *Deepwater Horizon* oil spill. As such, the delta experienced some of the most pervasive and repeated oiling events which caused extensive damage throughout these unique habitats and, impacting a host of wildlife species that rely on its services. Due to the size and scale of this specific injury, Trustees asserted that landscape-scale restoration was the most appropriate and effective means to address 2010 *Deepwater Horizon* oil spill impacts to the delta. This project entails hydrologic restoration of the Mississippi River Bird's Foot Delta by dredging select passes (Pass-a-Loutre, South Pass and Southeast Pass). In doing so, the Mississippi River will be reconnected to the Bird's Foot Delta's eastern and central marsh complexes.

The project seeks to accomplish four principal goals:

- Restore riverine processes to enhance natural marsh accretion via existing small sediment diversions (crevasses) - creating approximately 750 acres of tidal wetlands.
- Build and enhance over 1,500 acres of subtidal mudflats and submerged aquatic weed beds.

- Use dredged sediment beneficially to create over 1,000 acres of fresh and brackish marsh.
- Use dredged sediment to create approximately 20 acres of beach habitat for colonial nesting waterbirds such as terns, black skimmers and solitary shorebirds.

The project will initially yield measurable benefits by building new wetlands from the dredged sediment; however, the primary long-term project benefits will result from restoring the hydrology of the Bird's Foot Delta. With flow increased through the passes proposed for dredging, the Mississippi River will be able to disperse its sediment laden freshwater payload (land building) and lower salinities within to the marshes and bayous of the delta (approximately 100,000 acres). This project is truly a total ecosystem restoration project, as it would have a positive influence on land manager's ability to implement wildlife conservation measures which have a direct nexus to enhancing the public's recreational opportunities (fishing, hunting, boating, camping, and several other non-consumptive activities) within the Bird's Foot Delta.

Proposed Timeline

Engineering and design activities are ongoing.

RECREATIONAL-USE RESTORATION PROJECTS

The 2010 *Deepwater Horizon* oil spill prevented Louisiana citizens from enjoying typical recreational activities, such as fishing and spending time on the beach. As such, trustees were charged with the restoration of lost recreational opportunities. To restore these losses, LDWF focused on:

- Creating new or improved access to natural resources for recreational purposes by enhancing existing or constructing new infrastructure.
- Providing or improving water access in publicly owned areas through the construction and operation of boat ramps, piers or other infrastructure could also improve public access.
- Larger-scale infrastructure improvements such as the construction or improvement of roads and bridges could also serve to improve access to natural resources.

TABLE 9. Status of individual 2010 Deepwater Horizon oil spill recreational-use projects.

PROJECT	DESCRIPTION	STATUS (FY 2021-2022)
Atchafalaya Delta WMA Campground Improvements	Bulkhead installation, sediment placement behind the bulkhead to restore some of the lost acreage of the campground, and jetty construction to stabilize the bank and bulkhead.	In Progress
Atchafalaya Delta WMA Improvements	Dredged Breaux Pass and Cul-de-sac Pass to enhance recreational access for hunters, anglers, and wildlife viewers to, and many interior waterways and wetlands.	Completed, 1/14/21
Middle Pearl Boat Launch	Improvements to the existing boat launch on the west bank of the Middle Pearl River in the Pearl River WMA in St. Tammany Parish to enhance access to waterborne recreational opportunities within the WMA	Completed, 11/16/21
Pass-a-Loutre WMA Campground Improvements	Improvements at five existing campgrounds in the Pass-a-Loutre WMA to enhance the experience of campground users and reduce ongoing erosion.	Completed, 8/17/20
Pass-a-Loutre WMA Crevasse Access	Construction of five crevasses in natural spoil banks along passes within the Pass-a-Loutre WMA to provide recreational hunters, fishermen, and non-consumptive users access to wetlands that are currently inaccessible by boat.	Completed, 8/17/20
Pointe-aux-Chenes WMA Island Road Fishing Piers and Boat Landing (Phase I)	Construction of five small parking lots, or vehicle pull overs, with adjoining fishing piers along Island Road in the Pointe-aux-Chenes WMA in Terrebonne Parish.	Completed, 11/19/20
Pointe-aux-Chenes WMA Water Control Structure, Docks and Pirogue Launch (Phase II)	Improvement of eight recreational enhancements within the Pointe aux Chenes WMA, including fishing piers, and renovation of the existing Island Road boat launch.	Completed, 12/13/21
Pointe-aux-Chenes WMA Pirogue Pullovers (Phase III)	Improvement of eight recreational enhancements within the Pointe aux Chenes WMA, including pirogue pullovers and launch.	In Progress
Rockefeller Wildlife Refuge Piers	Recreation enhancements within the Rockefeller Wildlife Refuge in Cameron Parish, including construction of new fishing piers in Unit 4 within the Refuge for public use and recreations.	Completed, 7/3/20
Rockefeller Wildlife Refuge Informational Signage	Recreation enhancements within the Rockefeller Wildlife Refuge in Cameron Parish, including signage placement in Unit 4 within the Refuge for public use and recreations.	Completed, 7/3/20

- Enhancing public access would also include targeted acquisition of land parcels to serve as public access points.

For FY 2020-2021, *Table 9* provides an overview status of individual 2010 *Deepwater Horizon* oil spill recreational-use projects.

PROPOSED RESTORATION PROJECTS

RESTORATION PLAN #7.1

On Oct. 23, 2020, the Louisiana Trustee Implementation Group finalized Restoration Plan and Environmental Assessment #7: Wetlands, Coastal, and Nearshore Habitats and Birds. The plan formalized restoration of species and critical wildlife habitats that were significantly impacted by the 2010 *Deepwater Horizon* oil spill.

Terrebonne Bay HNC Restoration: Construction

Terrebonne Bay HNC represents one of the state's remaining historic brown pelican colonies. Located in Terrebonne Parish, the island is currently 32 acres, however, only less than 10 acres serve as suitable nesting habitat for brown pelican, roseate spoonbill (*Platalea ajaja*), royal tern (*Thalasseus maximus*), tricolored heron (*Egretta tricolor*), laughing gull (*Leucophaeus atricilla*) and various other species.

Initial project design will restore the island's original rock containment dyke footprint (approximately 50 acres). This action will serve two primary purposes: First, contain future deposited sediment and second, provide erosion protection from wind driven wave energy. Upon completion, island elevation will be increased via dredge sediment and suitable vegetation will be planted. Limestone aggregate will be deposited along the island's perimeter thereby a low maintenance beach-like feature for nesting terns and black skimmers. Collectively, these actions are intended to prevent routine tidal inundation and increase overall nesting success.

Proposed Timeline

Restoration plan is being finalized and will be submitted for public review and comment.

LOUISIANA TRUSTEE IMPLEMENTATION GROUP: MONITORING AND ADAPTIVE MANAGEMENT

Secretive Marshbird Population Modeling

Based on available habitat, Louisiana's coastal wetlands quite possibly supports the largest populations of secretive marshbirds in North America. However, the expansive and somewhat inaccessible nature of these habitats has generated significant data gaps (e.g., secretive marshbird species abundance and distribution within coastal basins), a fact that greatly limited the trustees' ability to document potential 2010 *Deepwater Horizon* oil spill injury to this guild. To address this problem, LDWF and the trustees proposed and received funding via Louisiana Trustee Implementation Group resolution in support of a multi-year collection of remotely sensed and local habitat data. These activities will be accomplished in tandem with call back surveys (i.e., the principal survey means for the guild) to create robust predictive models for estimating secretive marshbird densities within select coastal basins. Information generated from this project will address identified data gaps and greatly assist the trustees' ability to characterize and promote beneficial habitat features that may likely benefit this bird guild.

Within FY 2021-2022, the contractor completed the second field season (March-June 2022) which encompassed a broad geographic study area (Pontchartrain, Breton Sound, Mississippi River Delta, Barataria and Terrebonne coastal basins). The contractor established four points at each of 62 CRMS stations plus 10 restored sites. The contractor conducted a total of 1,101 callback surveys. Much lower water levels, particularly early in the season, were observed during 2022. Also, vegetation recovery following

Hurricane Ida in fall 2021 did not fully occur, if at all, until at least mid-spring. Understanding these relationships will greatly enhance understanding of multi-scale habitat relationships and facilitate restoration measures at broader scales so that habitats within a specific basin are provided regardless of site-specific hydrologic conditions.

Avian Guidance Document

Louisiana represents one of the largest and most dynamic coastal systems in the world consisting of a vast complex of freshwater, intermediate, brackish, and saline marshes, sandy barrier islands and headland beaches, estuaries, and nearshore marine habitats. These critical habitats support regionally, nationally, and, in some cases, globally important populations of migratory and resident bird species (Remsen et al. 2015). The 2010 *Deepwater Horizon* oil spill caused extensive negative impacts (injuries) to these bird populations and to their habitats, reducing habitat quality and resource availability necessary for the recovery of these bird populations.

Within the Louisiana Trustee Implementation Group, the Small Bird Group continues to identify and prioritize critical informational needs (Louisiana Trustee Implementation Group Resolutions: Colonial Water Birds, Secretive Marsh Birds) to facilitate more efficient and representative bird restoration projects throughout Louisiana. As such, the Small Bird Group proposed and received funding for the development of a Guidance Document for Avian Habitat Restoration and Monitoring in Louisiana (Avian Guidance Document or Deliverable); a deliverable(s) which integrates coastal processes and avian ecology requirements with potential coastal engineering/construction specifications within representative individual coastal habitats/regions, based on Taxonomic Working Groups. Deliverable(s) will address a major knowledge gap and is considered critical in supporting ongoing and future 2010 *Deepwater Horizon* oil spill avian restoration activities. Further, deliverable(s) will greatly enhance the Louisiana Trustee Implementation Group's ability to inform the general public regarding restoration of their injured natural resources.

Final Deliverables

For each of the following bird types (Shrub Nesting Birds, Ground Nesting Birds and Marsh Nesting Birds), the final deliverable(s) will document:

1. Habitat(s) and beneficial features within these habitat(s) utilized for meeting targeted aspects of avian species life history requirements, with emphasis placed on increased nesting and reproductive productivity, to efficiently and effectively restore Louisiana's injured coastal bird species.
2. Guidelines for project engineering and construction to maximize the development of productive avian habitat(s) and/or incorporation of beneficial habitat features within restoration projects.
3. Standard comprehensive monitoring protocol(s) required to facilitate documentation of avian benefits generated by both individual (i.e., site-scale) and broader coastwide Louisiana restoration projects.

Proposed Timeline

Based on current scheduling, project should be completed in spring 2023.

REGION-WIDE TRUSTEE IMPLEMENTATION GROUP: RESTORATION PLAN #1 / ENVIRONMENTAL ASSESSMENT

Chandeleur Islands Restoration: Engineering & Design

2010 *Deepwater Horizon* oil spill Region-wide Trustee Implementation Group funds have been designated to complete engineering and design for a large-scale restoration project benefiting the Chandeleur Islands and the many species that use them with a particular focus on birds. The Chandeleur Island chain is a series of barrier islands in eastern St. Bernard and Plaquemines parishes in Southeast Louisiana. The islands are located between the Gulf of Mexico and Chandeleur Sound. The Chandeleur Islands include Chandeleur Island, Gosier Islands, Grand Gosier Islands, Curlew Islands, New Harbor Island, North Island, Freemason Island, and a few unnamed islands. This engineering and design project focuses on restoration of the large Chandeleur Island, the seagrass beds behind it, its southern fragmented portion, and New Harbor Island; a significant historic colonial waterbird nesting colony. The islands and seagrass beds that would be the focus of this engineering and design project are state and federally owned and collectively managed by the USFWS via memorandum of agreement with LDWF as Breton National Wildlife Refuge.

There are more than 50 species of flora and fauna designated as SGCN on the Chandeleur Islands. Some of these species' only occurrence in Louisiana is on these islands. New Harbor Island contains the largest density of nesting birds on the island chain. The Chandeleur Islands are also the only significant site of sea turtle nesting in Louisiana, the northernmost nursery for lemon sharks, and provide important habitat for a variety of fisheries species.

The islands have suffered extensive damage from hurricanes, especially Georges in 1998 and Katrina in 2005. They are also subject to subsidence, sea level rise, and suboptimal sediment input. The islands and seagrass beds were damaged by the 2010 *Deepwater Horizon* oil spill, and then benefitted from the construction of spill-related mitigation sand berms. Despite the berm project, the project area is experiencing a high rate of land loss, which threatens the dozens of avian and aquatic species that depend on it as critical habitat.

This restoration project will complement and enhance ongoing efforts of Deepwater Horizon Trustees and other partners to address habitat loss and degradation to nesting and foraging habitats for a large number and wide variety of species.

Proposed Timeline

Engineering and design activities are ongoing.

REGION-WIDE TRUSTEE IMPLEMENTATION GROUP: MONITORING AND ADAPTIVE MANAGEMENT

Region-wide Colonial Waterbird Monitoring

Colonial waterbirds incurred significant injuries throughout the northern Gulf of Mexico as a result of the 2010 *Deepwater Horizon* oil spill. One of the principle means by which Trustees documented these injuries was through the implementation of regimented colonial waterbird aerial nest surveys and nest dotting analyses implemented in 2010 through 2013 (Colibri and Ford 2015). As this method has proven to be tremendously accurate (within 1 cm^2) and repeatable, the State of Louisiana has adopted this monitoring method in documenting individual and statewide performance (number of nests generated, adult bird census, etc.) within current and future colonial waterbird activities.

Building on theses success, Deepwater Horizon Region-wide Trustee Implementation Group funds (current and future) have been designated towards implementing region-wide (Texas through Florida) monitoring of colonial waterbird nesting activities. These activities are intended as one means by

which Trustees will document and partially evaluate colonial waterbird breeding population performance at a region-wide scale. It is envisioned that these efforts will be fully integrated with established, ongoing, smaller-scale monitoring programs thereby providing Trustees with a more comprehensive means to characterize benefits generated from 2010 *Deepwater Horizon* oil spill bird restoration activities. Other potential benefits associated with this activity include:

1. Population trend data necessary to contextualize outcomes from restoration activities throughout the Gulf (see Frederick and Green 2019).
2. Document outcomes of restoration projects that have already been implemented that lack a current bird monitoring component.
3. Partially inform future restoration decision-making by informing the cost-effectiveness (i.e., Restoration Evaluation) and the local and regional context of proposed projects (i.e., Restoration Planning).

Within FY 2021-2022, the contractor in the process of nest dotting analyses (individual species and nests) for 2021 data acquisition. Additionally, Contractor combining all data collections (2010-2021) within a singular database that will be hosted on an AWS server.

Proposed Timeline

Based on current scheduling, project should be completed by spring 2023.

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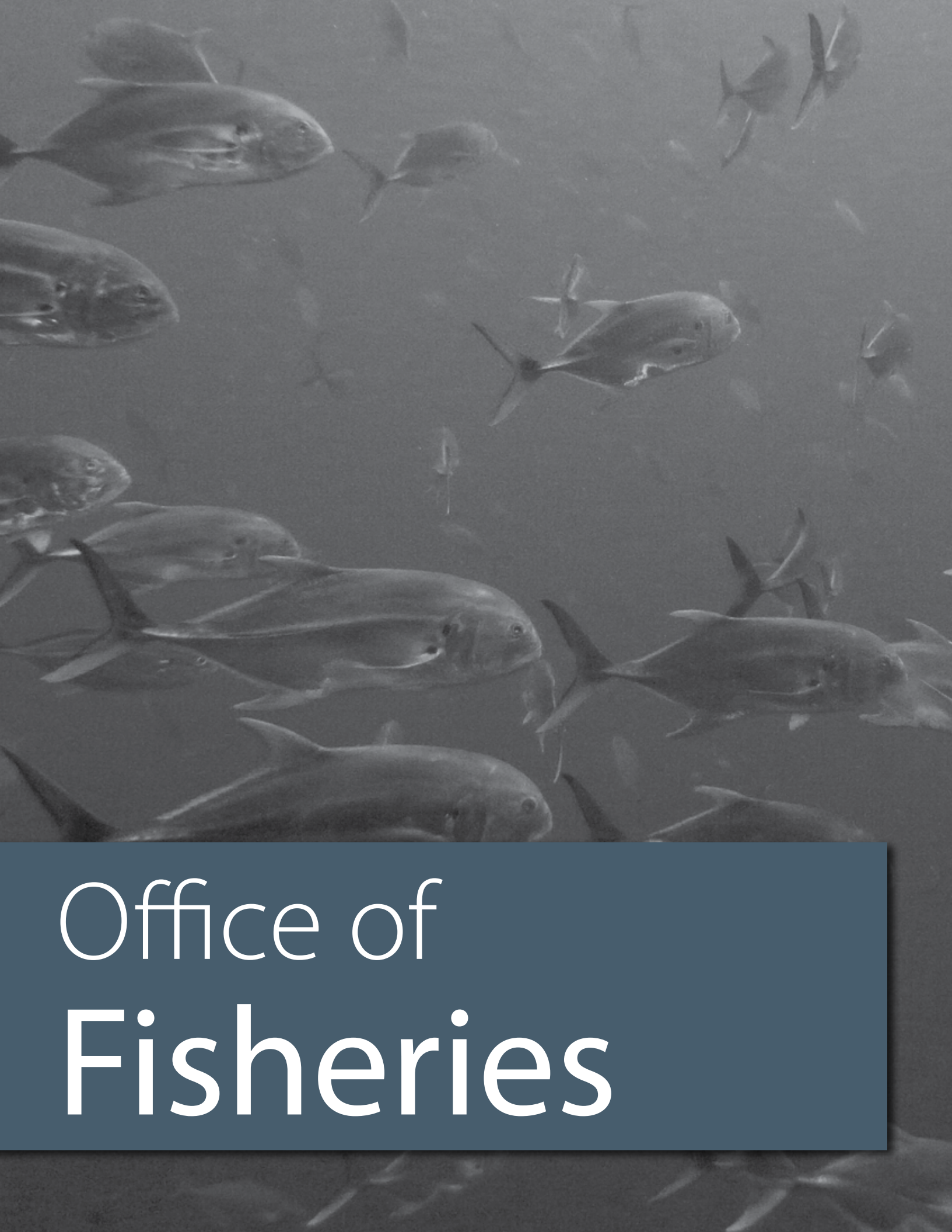


Office of Fisheries

MISSION

The purpose of the Fisheries program is to manage living aquatic resources and their habitat, to support the fishing industry, and to provide access, opportunity and understanding of the Louisiana aquatic resources to the state's citizens and other beneficiaries of these sustainable resources.

OBJECTIVES

- To provide high-quality fishery management information through effective data collection, analysis and information sharing.
- To be an effective, efficient steward of our renewable aquatic resources.
- To provide and enhance the recreational fishing experience through improved access, opportunity and public awareness.
- To maintain a sustainable and economically viable fisheries environment.
- To create a work environment in which all Fisheries staff are enabled and empowered to achieve the office's goals and objectives.

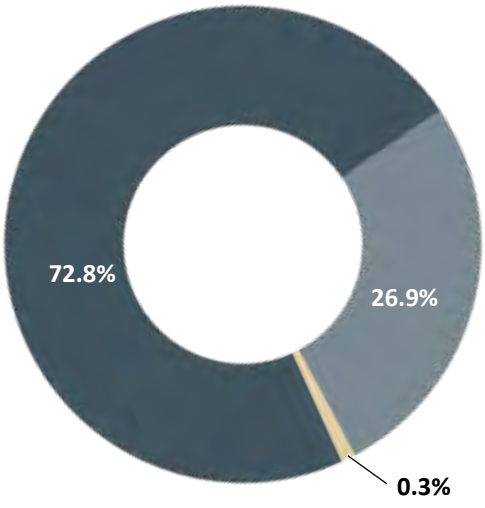
ORGANIZATION

The Office of Fisheries structure is comprised of the following sections and programs:

- ***Marine Fisheries*** - to manage the marine (saltwater) fisheries resources of the state.
- ***Inland Fisheries*** - to manage the inland (freshwater) fisheries resources of the state.
- ***Oyster Lease Program*** - to manage oyster lease agreements.
- ***Fisheries Research and Assessment*** - to provide technical and scientific research in support of fisheries management.
- ***Fisheries Extension*** - to provide guidance and assistance to Louisiana's valuable commercial fishing industries, and to provide fishery management information to the recreational sector through improved fishing and boating access, aquatic outreach and volunteer activities.

FISHERIES FUNDING

FISHERIES FUNDING SOURCES
(APPROPRIATED FUNDING)
Total: $38,378,536



- Statutory Dedications - $27,954,839
- Federal Funds - $10,306,721
- Self-Generated Funds - $116,976

The Statutory Dedications utilized by the Office of Fisheries are primarily from the Conservation Fund and the Artificial Reef Trust Fund. The Conservation Fund is funded primarily by license revenue and oil and gas revenue from Louisiana Department of Wildlife and Fisheries (LDWF) property. The Conservation Fund is a general funding source used to fund invasive aquatic plant control, marine commercial fisheries monitoring, socioeconomic analyses and reports, and general office operations. The Artificial Reef Trust Fund is funded through donations from oil and gas companies. Oil and gas companies donate one half of the realized savings over a traditional onshore removal of obsolete oil and gas offshore structures. The Artificial Reef Trust Fund is used to fund the building and monitoring of inshore, nearshore and offshore artificial reefs, and operations of the Artificial Reef Program.

Federal funds used by LDWF come from various federal entities, such as the U.S. Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA) and Gulf States Marine Fisheries Commission. Funds from USFWS are primarily from federal assistance through the Sport Fish Restoration Program. These funds are dedicated to marine and freshwater monitoring, research, management and boating access, aquatic education, and aquatic outreach. The funds from NOAA represent various grants that are utilized to collect offshore fisheries independent data and commercial fisheries dependent data. The funds from Gulf States Marine Fisheries Commission represent various grants that are utilized to collect recreational and commercial fisheries dependent data.

Interagency transfer funds are provided by other state agencies and used to fund various projects. These projects include fisheries monitoring associated with the state coastal master plan, oil spill response and damage assessment, and oil spill restoration projects.

Self-generated funds are provided by other non-governmental entities and are used to fund various projects. These activities include participation in Gulf of Mexico Fisheries Council and collaborations with various universities.

RESOURCE MANAGEMENT

Louisiana's fisheries resources benefit all constituent groups in Louisiana, across the Gulf Coast and throughout the nation. The Louisiana Constitution of 1974 provides the framework to protect and enhance habitat and to ensure sustainable commercial and recreational fisheries. Fisheries biologists collect the basic ecological data needed to efficiently and effectively manage fisheries resources to benefit all constituent groups.

LDWF is responsible for managing Louisiana's fisheries and maintaining healthy fish populations and habitat for the benefit of Louisiana's residents and visitors of both today and tomorrow. Responsible fisheries management starts with sound, scientific information about fish populations and the ecosystems in which they live, as well as the fisheries that harvest them. LDWF biologists use a variety of methods to gather this information, including examining fishermen's catch (fishery dependent data) and conducting scientific studies (fishery independent data).

MONITORING

Monitoring fisheries, both fresh and saltwater, is a crucial component of resource management. Important biological data is collected specific to each type of sampling. In addition, hydrological data (conductivity, turbidity, dissolved oxygen, salinity and water temperature) are collected with each biological sample, as are air temperature and unusual or other significant conditions. The information gathered during monitoring efforts, such as fisheries independent sampling, gives biologists and administrators the information essential to manage each fishery appropriately; openings, closures, limits and emergency actions are based upon monitoring data.

SHRIMP SAMPLING

The long-term objectives of the shrimp fishery research program are to assess and monitor shrimp stocks and to evaluate shrimp fishery impacts on other fisheries and protected species. Each species requires an assessment of the condition of the stock, the fishery and sectors of the economy that are impacted by changes in either. The assessments are also needed so that LDWF can determine whether or not a stock is overfished.

Inshore and offshore shrimp sampling continued during FY 2021-2022. In inshore waters, 255 6-foot and 1,462 16-foot trawl samples were collected. In state offshore territorial waters and the Exclusive Economic Zone, 242 20-foot trawl samples were collected. Information crucial to setting the opening dates of the 2022 spring inshore shrimp season, closure dates of the 2022 spring inshore shrimp season, opening and closing dates of the 2021 fall inshore shrimp season, and the closing and reopening of shrimping in portions of state territorial waters in 2021 and 2022 was collected using these sampling procedures.

OYSTER SAMPLING

Management of the public oyster grounds and reservations relies heavily upon data gathered through a comprehensive biological monitoring program. State biologists use two gear types (24-inch hand dredge and square-meter frame) when sampling the public reef areas, and analyze the data collected to determine overall health of the oyster resource. For annual stock assessments, LDWF biologists collect field samples in July from each coastal study area across Louisiana to perform a quantitative evaluation of the oyster stock on the state's public oyster areas. Biologists SCUBA dive on designated sampling stations within each coastal study area. At each sampling station, an aluminum square-meter frame (quadrat/m^2) is randomly placed on the oyster reef, and all live and dead oysters, reef-associated organisms, and exposed reef material are collected by hand from the upper portion of the substrate within the quadrat. At each station, five replicate square-meter samples were collected and data were combined to produce average density of spat, seed, and sack oysters per meter. Oyster density was multiplied by the associated reef acreage to obtain an estimate of total oyster population size. Water temperature, dissolved oxygen, and salinity data are collected in conjunction with the m^2 samples, and cultch material types are identified and weighed. Sampling conducted as part of the annual oyster stock assessment plays a valuable role in making biological recommendations for the upcoming oyster season, which generally opens in mid-September and runs through the end of April of the following year. However, the season may be closed or delayed if biological concerns or enforcement problems are encountered. LDWF uses the annual oyster stock assessment information to make recommendations regarding setting the oyster season to the Louisiana Wildlife and Fisheries Commission.

Oyster seasons are driven by data from the annual Oyster Stock Assessment square-meter sampling event. In July 2021, 515 square-meter samples were collected from 103 sample stations (including Sabine Lake) coast-wide for the Oyster Stock Assessment. Seventy-five square-meter samples were collected at the same time from 25 sample stations in the Barataria Basin as per the CPRA System-Wide

Shrimp sampling

Oyster sampling

Assessment and Monitoring Program (SWAMP) agreement. In the fall of 2021, 228 square-meter samples were collected from 76 stations in the Barataria and Pontchartrain basins for SWAMP. That sampling was repeated in spring 2022. In total, 1,046 square-meter samples were collected in FY 2021-2022.

Dredge data is used to monitor the overall health of the oyster resource during the year and to assess the recruitment of new age classes of oysters into the population. Two replicates were taken per station per month, except July, to monitor size frequency, presence and/or absence of resource, and mortality. July is reserved for (square-meter) stock assessment sampling mentioned above. For FY 2021-2022, 1,627 dredge samples were collected from 78 sample stations. Included in this sample station count and annual sample tally are three (monthly) SWAMP stations in Barataria Basin and six dredge stations in Sabine Lake which were sampled quarterly as opposed to monthly.

The LDWF constructed a 200-acre oyster reef in Sister Lake (Terrebonne Parish) in late summer 2021 to increase oyster habitat and fisheries production. This project was funded through Deepwater Horizon Natural Resource Damage Assessment settlement dollars to restore for injuries to oysters that occurred as a result of the spill. LDWF monitored the performance of the plant through regularly scheduled sampling events. A grid map of (200) 1-acre grid squares was generated for the constructed reef, and 10 grid sites were randomly selected for each sampling event. A single sample was collected per selected grid. Quarterly dredge sampling was conducted in November 2021, February 2022 and May 2022 (30 samples total).

Quarterly monitoring sampling on the (4) Natural Resource Damage Assessment Brood reefs was designed to retrieve baskets, evaluate contents for live oyster size class and density, and redeploy baskets to be sampled at next quarterly monitoring event. Six sample baskets were deployed in December 2021 on each reef and on adjacent substrate devoid of rock riprap and are to be monitored quarterly to characterize reef performance. Monitoring in April and June 2022 found no live oysters at any of the sites.

Field biologists also gather hydrological data when conducting square-meter and dredge sampling. During oyster seasons, field staff conduct boarding report surveys of oyster boats harvesting from public oyster areas. Boarding survey data allows them to develop harvest and fishing effort estimates for their respective region. During bedding season, in which commercial fishers collect live oysters from the Public Oyster Seed Grounds and transport them on their private leases, field biologists sample bedding loads to determine that the portion of non-living reef material does not exceed a set maximum benchmark value. For the 2021-2022 oyster season, 15% non-living material was the maximum allowance in bedding loads. Biologists work with Enforcement agents in monitoring oyster bedding vessels for the duration of oyster bedding seasons.

Reef acreages are determined using periodic side-scan sonar surveys, historical reef maps and poling surveys. In FY 2021-2022, side scan surveys were completed in Morgan Harbor, Sister Lake, Drum Bay, Lake Machias, Petit Pass, Mozambique Point, and Karako Bay. In July 2021, 200 acres in Sister Lake (Terrebonne Parish) were surveyed for water bottom characterization ahead of the 2021 Sister Lake CP construction project. The 200 acres was re-surveyed for post project characterization in September 2021. Similarly in October 2021, LDWF conducted a water bottom assessment and characterization of three areas totaling approximately 900-acres in Drum Bay (St. Bernard Parish), Louisiana. In May 2022, LDWF completed a water bottom assessment survey of approximately 8,300 acres in Morgan Harbor (St. Bernard Parish, Louisiana) to identify existing oyster reefs, characterize bottom types, and assist in the planning of future restoration projects. Ten-acre sites in Lake Machias, Petit Pass, Mozambique Point, and Karako Bay (Plaquemines and St. Bernard Parishes) were surveyed both pre and post-project construction as part of their Natural Resource Damage Assessment broodreef project design (Fall 2021).

Annual Oyster Stock Survey

The statewide public oyster stock size in 2021 increased from 2020 levels, where approximately 362,783 barrels (one barrel = two sacks) of oysters increased to 372,933 barrels available on the public oyster areas of Louisiana (excluding Sabine Lake). While the 2021 stock estimate represents an increase of 3% compared to 2020, it is 33% lower than the 10-year long-term average (2011 through 2020) of 559,227 barrels.

LDWF has monitored oyster populations in Sabine Lake using established monitoring stations and conducting annual oyster stock assessments, but in the 2018 regular legislative session, Act 159 was passed placing a permanent moratorium on the harvest of oysters in Sabine Lake. LDWF currently conducts population stock assessments every other year due to the moratorium. Sabine Lake oyster stock availabilities are not included in statewide estimates, again, due to the moratorium on harvesting; but assessment of Sabine Lake was completed in July 2021. Availability for Sabine Lake was reported to be 182,416 barrels.

Spat on Shell Monitoring

Michael C. Voisin Oyster Hatchery located in Grand Isle, LA is operated cooperatively by both LDWF and Louisiana Sea Grant and it produces oysters set on recycled oyster shells. Many collaborations were made to construct, set, and deploy hatchery-produced spat-on-shell. LDWF collaborates with the Coalition to Restore Coastal Louisiana's oyster shell recycling program, which began in FY 2013-2014. The Coalition to Restore Coastal Louisiana collects and stockpiles oyster shell from Louisiana restaurants. Spat on shell was deployed on a West Karako Artificial Reef on May 11, 2021. The six-month monitoring conducted in December 2021, recorded 112 live seed and spat oysters and 145 dead oysters (56% mortality) in (3) 1/3 meter quadrat samples.

Two additional spat on shell deployments were conducted on the newly constructed (Natural Resource Damage Assessment) brood reefs. In May 2022, 455 shell bags with an estimated 2 million spat were deployed at one location in Karako Artificial Brood reef; and in June 2022, 422 shell bags with an estimated 8 million spat were deployed at one location at Lake Machias Artificial Broodstock reef. One-month monitoring samples were collected on the Karako deployment in June 2022. Ninety shells were collected and 285 live/125 dead oysters were recorded.

TABLE 1. 2021 Michael C. Voisin Oyster Hatchery fall production of diploid pediveligers and seed used by Louisiana Sea Grant and LDWF for restoration, sales and research.

	PURPOSE	DIPLOID
Total Pediveligers	LDWF Sales	18,846,496
Total Pediveligers Set on Microcultch	Produce Seed for LDWF Sales	638,498
Total Seed	LDWF Sales	0
Total Pediveligers Set on Macrocultch	LDWF Restoration	232,000

TABLE 2. Michael C. Voisin Oyster Hatchery fall production of diploid, triploid, and tetraploid pediveligers and seed used by Louisiana Sea Grant and LDWF for sales, restoration and research.

PLOIDY	STAGE	SALES TOTAL	RESTORATION TOTAL	RESEARCH TOTAL
Diploid	D-Stage	0	31,333	0
	Veliger	0	325,167	0
	Pediveliger	0	4,054,832	398,998
	Seed	0	0	0
Triploid	D-Stage	0	0	0
	Veliger	0	0	0
	Pediveliger	0	0	0
	Seed	0	0	0
Tetraploid	D-Stage	0	0	0
	Veliger	0	0	0
	Pediveliger	0	0	0
	Seed	0	0	0
Larval Totals		***0***	***4,411,332***	***0***
Seed Totals		***0***	***0***	***398,998***

TABLE 3. Fall 2021 hatchery-produced spat-on-shell production.

LOCATION	LARVAL BROOD NAME(S)	EST. TOTAL # OF PEDIVELIGERS SET ON MACROCULTCH	DEPLOYMENT DATE
Independence Island Artificial Reef	2n_07/13/21	232,000	July 2021

TABLE 4. 2022 Michael C. Voisin Oyster Hatchery spring production of diploid pediveligers and seed used by Louisiana Sea Grant and LDWF for restoration, sales and research.

	PURPOSE	DIPLOID
Total Pediveligers	LDWF Sales	40,688,149
Total Pediveligers Set on Microcultch	Produce Seed for LDWF Sales	89,471,833
Total Seed	LDWF Sales	660,000
Total Pediveligers Set on Macrocultch	LDWF Restoration	0
Total Seed	LDWF Restoration	1,333,195

TABLE 5. 2022 Michael C. Voisin Oyster Hatchery spring production of diploid, triploid, and tetraploid pediveligers and seed used by Louisiana Sea Grant and LDWF for restoration, sales and research.

PLOIDY	STAGE	SALES TOTAL	RESTORATION TOTAL	RESEARCH TOTAL
Diploid	D-Stage	0	0	0
	Veliger	0	970,000	0
	Pediveliger	0	104,260,166	11,000,000
	Seed	660,000	1,333,195	17,746
Triploid	D-Stage	0	0	0
	Veliger	0	0	0
	Pediveliger	0	0	0
	Seed	0	0	0
Tetraploid	D-Stage	0	0	0
	Veliger	0	0	0
	Pediveliger	0	0	0
	Seed	0	0	0
Larval Totals		**0**	**105,230,166**	**11,000,000**
Seed Totals		**660,000**	**1,333,195**	**17,746**

Oyster Kill Monitoring

LDWF is charged with managing, conserving and promoting fisheries resources in Louisiana's waters. Investigating fish and/or mussel kills is a high priority that requires the immediate attention of Fisheries personnel. LDWF is responsible for responding to fish kills in a timely manner because the cause and effects of fish kills are typically unknown at the time of initial notification.

In June 2021, LDWF Office of Fisheries created and distributed an Oyster Kill Response Plan, similar in design to the Fish Kill Response plan but modified to meet the needs of the Oyster Fishery. During FY 2021-2022, LDWF Office of Marine Fisheries did not experience any oyster kills during the reporting time.

Michael C. Voisin Oyster Hatchery Operation Overview

The Michael C. Voisin Oyster Hatchery is operated cooperatively by both LDWF and Louisiana Sea Grant. Louisiana Sea Grant is contracted to operate the facility and to provide recommendations to LDWF for hatchery operations. Louisiana Sea Grant hatchery staff work to produce oyster larvae and algae. Phycologists grow marine microalgae, which is used to feed oyster larvae and supplement broodstock holding systems. Louisiana Sea Grant staff includes a technical director and four research associates. Research associates include a head phycologist, larval production assistant manager, Louisiana Sea Grant Oyster Research and Demonstration Farm and Nursery manager, and the fourth provides general assistance with all operations. In addition, Louisiana Sea Grant hatchery staff provide extension services for people interested in topics such as growing oysters, producing larvae and operating seed nursery systems. Louisiana Sea Grant staff work to produce diploid, triploid, and tetraploid larvae and seed for orders, restoration, breeding program and research.

Louisiana Sea Grant manages the Louisiana Sea Grant Shellfish Breeding Program. This breeding program houses several breeding lines of diploid and tetraploid oysters. Diploid and tetraploid refers to the number of chromosome sets an organism contains (diploid being two sets and tetraploid four sets). Tetraploid oyster sperm is used to fertilize diploid oyster eggs, which reliably produces 100% triploid (three chromosome sets) oysters. LSU and a private breeding company, 4Cs Breeding Technologies, Inc., share intellectual prop-

erty rights for these tetraploids. 4Cs licenses the use of these tetraploid oysters.

Historically, LDWF focused to produce diploid larvae and spat for restoration, but that mission changed in 2018 when LDWF was tasked with administrating larval and seed sales. Sales had been a Louisiana Sea Grant task since the hatchery opened in 2015. Thus, throughout the hatchery season, which goes from March through November, LDWF distributes both diploid and triploid larvae and seed, produced by Louisiana Sea Grant, to fulfill customer sales orders and complete restoration projects.

2021 Fall Production

2021 Total Fall Production

Production of Fall 2021 was severely impacted by Hurricane Ida, which made landfall in Grand Isle on Aug. 29, 2021. The devastation of Ida forced hatchery operations to shut down for the remainder of 2021. Additionally, 9,563,953 diploid pediveligers and 398,998 triploid pediveligers were lost as a direct result of the storm. Due to infrastructure loss, remaining activities of the hatchery for fall 2021 consisted of facility cleanup and identifying and undertaking needed repairs.

Fall Spat-on-Shell

The LDWF Michael C. Voisin Oyster Hatchery produces diploid oyster larvae for setting on shell, which is then referred to as spat-on-shell and is used for state oyster restoration projects. To prepare for setting on shell, mesh bags that are three feet long are filled with recycled oyster shell and are called shellbags. Recycled shell is obtained through a collaboration with the Coalition to Restore Coastal Louisiana's Oyster Shell Recycling Program.

2022 Spring Production

Algal Production

Algal stock production began early spring 2022 and continued throughout the year following adjusted protocols from 2021. As in 2021, these modified protocols resulted in higher quality algae (of all species) and greater survival overall of algal cultures.

Larval Production

The 2022 spring larval production began in March with diploid spawn attempts and then triploid spawn attempts. Production began with diploid larvae for LDWF restoration efforts in the beginning of Spring 2022. Tetraploid spawns were attempted as appropriate male and female animals were identified. Total spring diploid production was as follows: 89,471,833 pediveligers set to produce seed for restoration. The seed were deployed at LDWF's Site.

Seed Production

A portion of the 2022 spring restoration production was set aside for seed sales. This effort resulted in 660,000 diploid seed sold.

MARINE FINFISH SAMPLING

The primary objective of the Finfish Program is to make rational recommendations for the management of coastal finfish stocks based on a database of scientific information. The information in the database is collected through fishery independent and dependent sampling. The fishery independent monitoring program is an ongoing collection of data by fisheries biologists in the field conducting surveys designed to sample coastal waters in an objective manner. The surveys collect information based on geographic ranges independent of commercial or recreational fishing operations.

Three gear types are used coast-wide to sample various year classes of estuarine-dependent fish:

1. A bag seine is used to sample young-of-the-year and provide information on growth and movement. More significantly, these samples provide information on the forage species and ecological components of marsh-edge and shoreline habitats throughout the coastal zone. Seine samples are taken monthly.
2. A gill net is used to sample juvenile, sub-adult and adult fish. It provides information on relative abundance, year class strength, movement and gonad condition. Gill net samples have been collected semi-monthly from April through September, and monthly from October through March using a strike net technique.
3. A trammel net is used to sample juvenile and sub-adult fish. It provides information on relative abundance, standing crop and movement. Trammel net samples are taken monthly from October through March.

Fish caught in a bag seine net

Marine finfish sampling with a bag seine net (left) and examining samples (right).

Marine finfish sampling with a gill net.

Marine finfish sampling with a trammel net: red drum above and sheepshead below.

During FY 2021-2022, the fishery-independent finfish sampling program collected 938 of 972 gill net samples (97%), 1,239 of 1,281 seine samples (97%), and 270 of 270 trammel net samples (100%), for a 96% overall completion rate statewide. Samples that were not collected were largely the result of tropical systems and hurricanes that impacted the coast.

Marine fisheries biologists also collected 137 electrofishing samples in the Barataria Basin as part of an Interagency Agreement for coastwide sampling.

FRESHWATER FINFISH SAMPLING AND MANAGEMENT

Waterbodies throughout Louisiana differ in their importance to the overall state fisheries and in the degree to which they can be managed. LDWF routinely samples a subset of rivers, streams, lakes and reservoirs based on their importance to the fishing public, size, productivity and, in the case of reservoirs, drawdown capability. Other considerations include existing and potential management needs that are specific to the waterbody. Waterbody sampling schedules are developed each year and monitoring and management results are reported in LDWF Waterbody Management Plan updates, which can be accessed on the LDWF website.

Freshwater fisheries resources are monitored and managed through various sampling methods. In FY 2021-2022, biologists estimated relative abundance, age, growth and mortality, size class structure, species composition and genetic composition of sportfish populations in addition to physiochemical characteristics of the water on 106 lakes, rivers and streams. Sampling sites on inland lakes, reservoirs and rivers are predetermined and selected to represent available aquatic habitats within the various water bodies. Sampling protocol is standardized to the extent possible to allow for comparison of data over time and includes electrofishing, lead net, seine net, hoop net and gill net gear types. Lotic sampling methodology follows lake methodology closely, with the addition of habitat type and river stage parameters. LDWF Inland Fisheries biologists have developed standard operating procedures for sampling rivers and wadeable streams for biomonitoring of fish and mussel communities.

Electrofishing samples are collected in both spring and fall to provide an estimation of population trends including abundance, size, distribution, age structure and genetic composition. Sampling includes largemouth bass and crappie in the spring and fall for species population assessments, and fish community assemblage samples of all species collected in the fall of each year. A total of 650 electrofishing samples were taken for 139 hours of timed electrofishing during FY 2021-2022.

Seine samples are taken in many water bodies to determine fish community relative abundance and young-of-the-year recruitment of popular sport fishes that might be underrepresented with electrofishing gear. These samples occur from June to August each year. Ninety seine hauls were made during the FY 2021-2022.

Entanglement and trap net webbing are also used during standardized sampling throughout the year to collect crappie, catfish, and sunfish species as well as nongame commercial species. A total of 131 gill net samples were taken on various lakes and rivers, and 186 lead net and hoop net samples were fished during FY 2021-2022.

Inland Fisheries staff conducting hoop net sampling as part of LDWF sport fish monitoring activities.

***LEFT:** Inland Fisheries staff weighing a Largemouth Bass as part of population monitoring activities.* ***RIGHT:** Inland Fisheries Biologist Manager, Jeff Sibley, holding a Largemouth Bass that was collected as part of LDWF sport fish population monitoring activities.*

With increased public demand for evaluation of freshwater fish harvest regulations, detailed sampling of largemouth bass to assess age and growth were completed on four water bodies during FY 2021-2022, while detailed sampling to assess age and growth of crappie continued on two lakes. The extensive age, growth and mortality data collected for these assessments are used to inform and evaluate future management decisions. More information can be found in the Stock Assessment section of this report.

Water quality data is collected each time a fisheries sample is collected on a waterbody. In FY 2021-2022, water quality samples were taken for physical and chemical criteria including temperature, dissolved oxygen, pH, salinity and conductivity coinciding with each biological sampling event and to monitor conditions following events such as tropical storms, droughts, and drawdowns.

Stocking data for LDWF waterbodies can be found in the Freshwater Fish Hatchery Program section of this report

RIVER AND STREAM SAMPLING

Understanding river basin biotic assemblages is an important aspect of fisheries management. Changes in community structure of aquatic biota in river and tributary systems within a watershed are indicators of anthropogenic and natural disturbances. Fish and mussel communities are sensitive to a wide array of direct and indirect stresses, including the effects of point source and non-point source pollution, sedimentation and changes in substrate deposition, habitat loss, riparian

***LEFT:** Inland Fisheries staff conducting gill net sampling as part of LDWF sport fish population monitoring.* ***RIGHT:** Inland Fisheries staff along side an Alligator Gar collected during LDWF sport fish population monitoring.*

zone disruption, physicochemical changes in water chemistry, and flow modification. Fish and mussels occupy positions throughout the aquatic food web and share a unique relationship. The larval mussel stage, or glochidia, is attached and parasitic on the host fish's gills or fins. After a period of time, the larval mussel drops off of the fish and settles to the stream bottom. All Inland Fisheries districts performed sampling on flowing waters to analyze species composition of fish, sport fish populations, crawfish, freshwater mussels, and to conduct habitat assessments. Thirty-eight sections of rivers, streams, bayous, and canal systems were sampled during FY 2021-2022, representing all of the major watersheds in the state.

***LEFT:** Inland Fisheries staff conducting electrofishing activities.* ***RIGHT:** Inland Fisheries staff holding an invasive carp collected during Aquatic Nuisance Species monitoring activities.*

AQUATIC INVASIVE SPECIES MONITORING

The "State Management Plan for Aquatic Invasive species in Louisiana" was written in 2005 and includes five objectives to help in the coordination and management of aquatic nuisance and invasive species within Louisiana. Briefly, the five objectives are to:

- Coordinate all aquatic invasive species management activities and programs within Louisiana and collaborate with other aquatic invasive species programs.
- Prevent and control non-indigenous invasive species through education.
- Eliminate locally established invasive species.
- Control the spread of established invasive species.
- Prevent the introduction of non-native species, or the spread of existing ones, through legislation and regulation.

The LDWF Aquatic Invasive Species Coordinator and LDWF biologists conducted the following activities during FY 2021-2022:

- Received approximately 1,000 calls and emails related to invasive species inquiries.
- Invasive Carp - Inland Fisheries Biologist collected plankton samples to locate breeding locations in major river basins. LDWF biologists continued to assist with a telemetry project that would help to understand how carp are moving between river basins in Louisiana. LDWF Aquatic Invasive Species Coordinator helped administer ongoing contracted studies including the use of carp to produce catfish feed; the use of carp as fertilizer and an impact study on native fish.
- Mississippi Interstate Cooperative Resource Association: Mississippi River Basin Panel - virtual meeting.
- Gulf and South Atlantic Regional Panel on Aquatic Invasive Species - Spring and Fall virtual meeting.
- The LDWF Aquatic Invasive Species coordinator along with Inland Fisheries staff participated In the Lower Mississippi River Invasive Carp Cooperative calls and webinars. This participation allowed LDWF to receive funds to support future invasive carp research in Louisiana.

The LDWF Aquatic Invasive Species coordinator compiled records and locations of aquatic invasive species within Louisiana waters and added those new occurrences to the USGS Non-indigenous Aquatic Species Program center database. Below is a list of aquatic invasive species monitored and logged occurrences for FY 2021-2022:

- **Apple Snail** - approximately 9,000 reports (most of which were from known locations)
- **Invasive Carp (bighead, black, grass, silver)** - over 120 reports for the carp tagged during telemetry project
- **Tiger Prawn** - Two reports
- **Asian Swamp Eels** - the population on Bayou St. John appears to be not spreading during this reporting period, only one eel was captured this year.
- **Tilapia** - during this reporting period there have been no collections of any fish from the tilapia population in University Lakes in Baton Rouge. It is believed this population has been eradicated.
- **Red Bellied Piranha** - one specimen was collected by the public. LDWF samples in the area and has not found any more piranha. It is also believed to be a single released fish and no more are likely to be found.
- **Murray Cod** - reported in the Burbank Soccer Park ponds in Baton Rouge. The specimen was not kept. LDWF sampled the area and did not find the specimen. LDWF will continue to sample the area as part of a long-term study.

FISH KILL MONITORING

LDWF is charged with managing, conserving and promoting fisheries resources in Louisiana's waters. Investigating fish and/or mussel kills is a high priority that requires the immediate attention of Fisheries personnel. LDWF is responsible for responding to fish kills in a timely manner because the cause and effects of fish kills are typically unknown at the time of initial notification. Also, fish kills are highly visible to the public and often prompt related questions that must be addressed, and they may serve as a symptom of more significant problems in an area. When responding to a fish and/or mussel kill, LDWF biologist managers refer to the American Fisheries Society Special Publication #30 Investigation and Monetary Values of Fish and Freshwater Mussel Kills for protocol. The selection of the most appropriate method for estimating fish kill numbers and species composition is dependent on the type of habitats involved. In some cases, strand line counts may be used, while in other cases, transects, segments or other methods are often necessary.

During FY 2021-2022, LDWF Office of Fisheries, Inland Fisheries Section investigated 45 fish kills throughout the state. Eighteen were attributed to naturally occurring low oxygen conditions in the rivers, lakes, and marshes. Four fish kills were attributed to chemical spills, and three were of indeterminate origin. Twenty fish kills were reported in the weeks following Hurricane Ida's Aug. 29, 2021, landfall (*Figure 1*). Seven of these reports were gathered from social media, while the other 13 were gathered traditionally, from public calls or staff observations. Following the initial fish kills, water quality was measured in the zone of impact in September. The area impacted by fish kills was

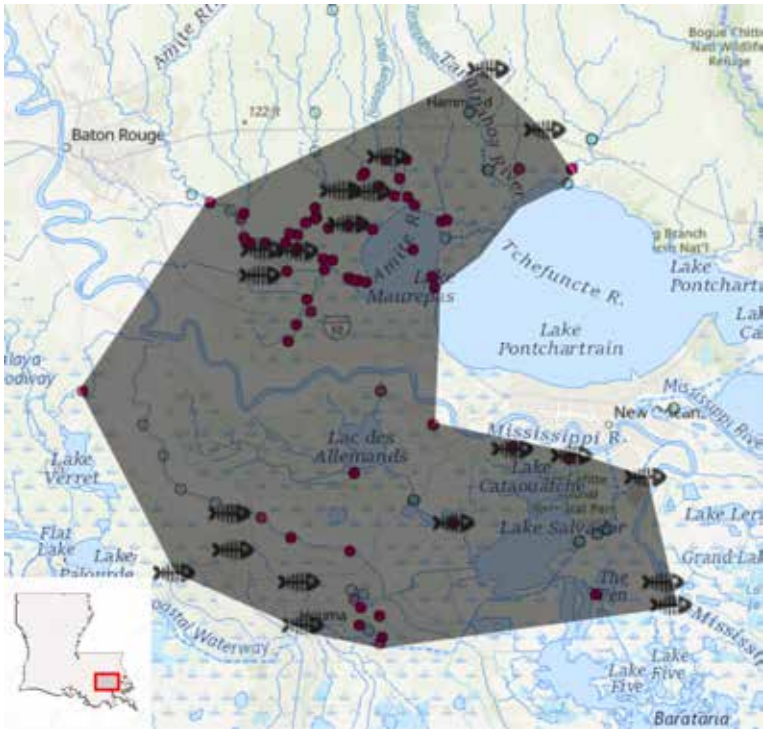


***FIGURE 1.** Extent of Hurricane Ida fish kills. Dead fish denote reported fish kills, red dots denote hypoxic water conditions, and light blue dots denote DO measurements above 2 mg/L.*

approximately 1.8 million acres, with a rough estimate of 280 million fish killed.

During FY 2021-2022, LDWF Office of Marine Fisheries investigated seven fish kills throughout the state, one of which was associated with the passage of Hurricane Ida. Most causes were attributed to naturally occurring low oxygen conditions in the rivers, lakes, canals and marshes.

OYSTER LEASE PROGRAM

The leasing and permitting of state water bottoms for cultivating oysters is administered by the Office of Fisheries. The Oyster Lease Program is responsible for maintaining records, collecting revenue and issuing lease agreements for this purpose. In April 2020, the Wildlife and Fisheries Commission approved a notice of intent lifting an 18-year moratorium on new oyster lease agreements. Currently, the program continues to work with the Office of State Lands and CPRA to issue new oyster lease applications in various coastal parishes throughout the state. The issuance of these applications will conclude Phase 0 of the moratorium lifting process, which is expected to conclude by the summer of 2023.

At this time, there are 7,972 leases covering 401,971 acres of water bottom. These leases account for $1.2 million in annual revenue. This revenue is specifically deposited into the Public Oyster Seed Ground Development Account for the enhancement of the state's public oyster resource. During FY 2021-2022, the Oyster Lease Program renewed 1,451 leases. There is a $30 renewal fee for each application totaling $43,530. The Oyster Lease Program transferred and documented the exchange of 381 leases sold in FY 2021-2022. There is a $10 fee for each lease transfer totaling $3,810. The Oyster Lease Program provided Geographical Information Systems data to the public at a total cost of $1,400.

The Oyster Lease Program worked with CPRA to modify 31 lease boundaries to accommodate coastal restoration projects in FY 2021-2022. The Oyster Lease Program assisted the LDWF Enforcement Division by publishing 51 maps to be used in court cases across the state.

ALTERNATIVE OYSTER CULTURE PERMITTING PROGRAM

Beginning in 2013, the Office of Fisheries was tasked with issuing Alternative Oyster Culture Permits. These permits offer commercial fishermen an opportunity to cultivate oysters using alternative methods on state leases or on privately owned water bottom. Currently, six sites are permitted, covering approximately 117 acres of water bottom. Out of the six sites, three permits have been issued on private property.

COMMERCIAL HARVEST

Louisiana produces nearly one-quarter of the seafood in the continental United States. Louisiana comes in second only to Alaska in terms of commercial fishing production and is home to three of the top six commercial fishing ports in the country. In the Gulf of Mexico, 78% of the seafood production comes from Louisiana shrimpers, crabbers, oyster harvesters and fishermen. 9,091 commercial fishermen and 4,711 seafood dealers/processors and brokers register each year to provide the nation with fresh seafood.

LDWF utilizes the Trip Ticket Program to collect commercial seafood statistics. Through this program, commercial landings data are collected on a trip basis from wholesale/retail seafood dealers, crab shedders and commercial fishermen holding fresh products licenses. There were 185,376 commercial fishing trips reported in FY 2021-2022 producing in excess of 865 million pounds of seafood. Seafood landings reported now include menhaden, which explains the large increase from the last reported landings.

Beginning in May 2000, a computerized electronic trip ticket program was developed and made available to dealers. To date, 121 dealers use the computerized program to submit their trip ticket data. Trip ticket information has been used:

- to enhance the accuracy of stock assessments conducted by state and federal fishery management agencies.
- to extend certain inshore shrimp seasons providing additional economic opportunity to fishermen.
- to develop a crop insurance program for oyster growers.
- to estimate damages from hurricanes, 2010 *Deepwater Horizon* oil spill, CARES Act, and floods.

Along with the collection of commercial landings data, LDWF also conducts trip interviews of commercial fishermen to gather detailed information about a specific fishing trip. The federally funded program focuses on species of greatest state and federal interest.

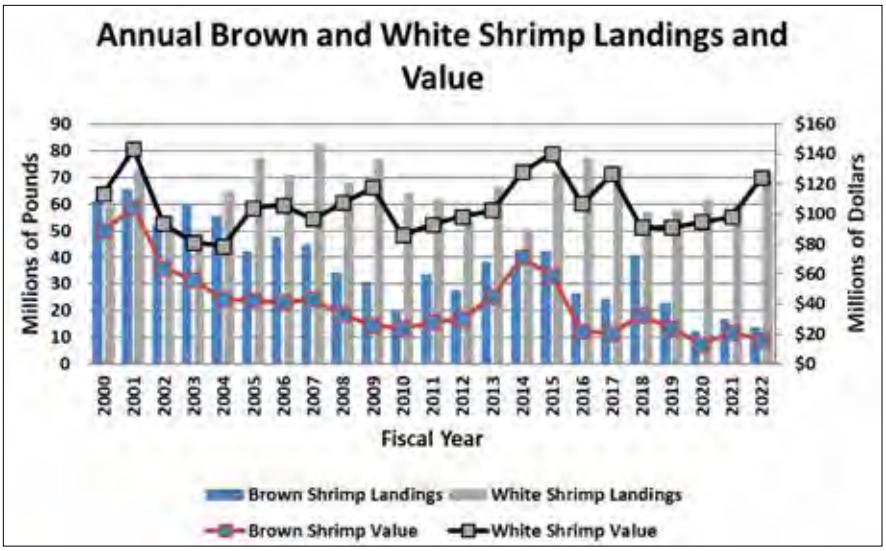


FIGURE 2. *Annual white and brown shrimp landings and value (Source: LDWF trip ticket data).*

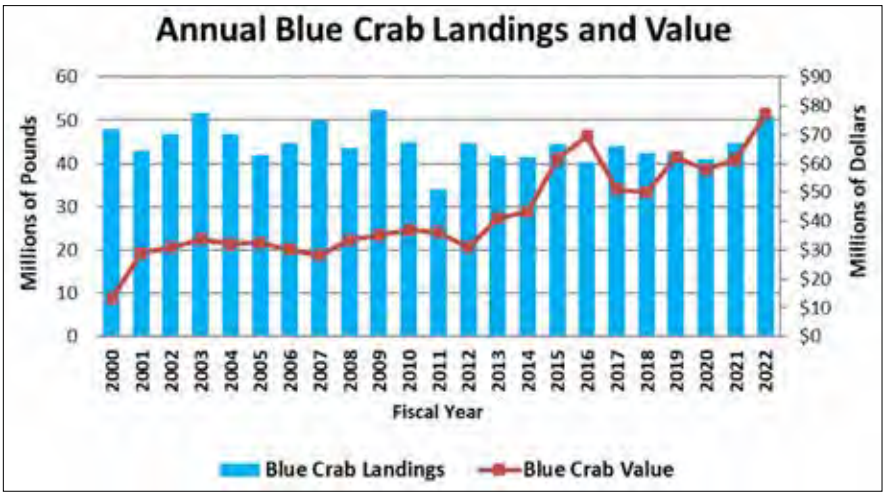


FIGURE 3. *Annual blue crab dockside landings and values (source: LDWF trip ticket data).*

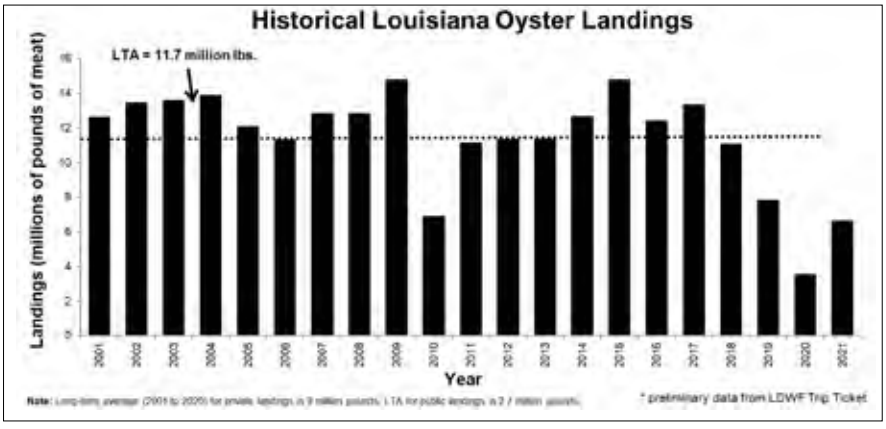


FIGURE 4. *Historical Louisiana Oyster Landings from private oyster leases and public oyster areas.*

Shrimp are the state's most valuable fishery. In FY 2021-2022, total shrimp landings measured over 83.1 million pounds (all species combined/heads on weight) and had a dockside value of approximately $119.4 million. Brown shrimp landings in FY 2021-2022 measured 14.1 million pounds (heads on weight) with a dockside value of $16.1 million, while white shrimp landings in FY 2021-2022 measured 68.7 million pounds (heads-on weight) with a dockside value of $124.0 million (*Figure 2*). White shrimp landings in FY 2021-2022 exceeded the previous fiscal year by more than 9 million pounds and was the highest since FY 2016-2017; white shrimp dockside value was also the highest since FY 2016-2107. Brown shrimp landings in FY 2021-2022 were below the previous fiscal year and well below the long-term average. Although brown shrimp recruitment and overall abundance in the spring of 2022 looked similar to past years, brown shrimp landings may have shown a significant decrease in FY 2021-2022 due to the increased presence of larger, more marketable white shrimp. As evident in the FY 2021-2022 white shrimp landings, white shrimp were present throughout the 2022 spring inshore shrimp season and it could be assumed that shrimp fishers targeted these shrimp for their higher value and smaller, less expensive, brown shrimp were not the primary target, as with normal spring shrimp seasons.

Louisiana commercial blue crab landings for FY 2021-2022 totaled approximately 51.0 million pounds and had a dockside value of nearly $77.2 million (*Figure 3*). Blue crab landings in FY 2021-2022 were more than 6.6 million pounds above the long-term average. Dockside values have seen an upward turn beginning in FY 2015-2016. During the 23 years covered below, only FY 2015-2016 had a higher price per pound than FY 2021-2022.

Since 2004, Louisiana has been the leading oyster producing state every year, with the exception of the year of 2020. During that time frame, Louisiana accounted for 48% of all Eastern Oyster landings in the country. In the last 10 or so years, the public oyster reef landings have diminished. In 2020, the landings from public grounds totaled approximately 34,000 pounds of meat, while private oyster reef landings totaled approximately 3.5 million pounds of meat, which reflects 99% of all oyster landings in the state. Total 2020 landings were the lowest ever recorded, a reflection of the unprecedented extreme 2019 Floods that affected the oyster reefs across the state (*Figure 4*); however, 2021 combined landings showed recovery

landing about 6.6 million pounds of meat, recovering Louisiana as the number one producer of eastern oysters in the country.

Louisiana commercial freshwater finfish landings for FY 2021-2022 totaled approximately 12.5 million pounds and included common species such as alligator gar, blue catfish, channel catfish, flathead catfish, freshwater drum, buffalo, bowfin, carp and gizzard shad. Total dockside value of these species was approximately $5.7 million. Wild caught crawfish landings in Louisiana for FY 2021-2022 was approximately 9.6 million pounds with a dockside value of $15.4 million.

RECREATIONAL HARVEST

LDWF monitors recreational fisheries through the LA Creel Program and inland creel surveys. The LA Creel Program uses dockside interviews of recreational anglers to determine catch and a telephone/email survey to determine fishing effort.

Through the LA Creel program, 11,269 recreational fishing trips, comprised of 29,898 individual anglers, were surveyed dockside during FY 2021-2022. Sixty-three different interviewers completed 1,545 (94%) of the 1,643 assignments as drawn during the sample period. Seventy-four assignments were cancelled due to Louisiana State office closure declarations caused by storms. Five more assignments should have been worked, but were missed due to various reasons.

Fish kept by anglers and allowed to be viewed by interviewers are referred to as observation Type 1 fish. Fish in possession of the angler at the time of survey but not seen by the interviewer are classified as observation Type 2 fish. Although shellfish is counted whenever present, LA Creel is concerned with finfish. For that reason, observation figures pertain to finfish only. For FY 2021-2022, 86,666 Type 1 fish, equaling 77% of all fish in possession of the angler at the time of survey, were identified and counted by staff. Type 1 observation numbers have been depressed since the onset of COVID-19 in 2020 as social distancing became commonplace. There were 26,337 Type 2 observations made.

Seventy-five species were represented among Type 1 fish. Spotted seatrout was the most commonly counted species, with 43,306. Red drum was second with 14,614 counted and sheepshead was the third most common with 5,680 counted.

Certain species returned to the water or caught and used for bait are also recorded. Those species are:

- Black Drum
- Gray Snapper
- Gray Triggerfish
- Greater Amberjack
- King Mackerel
- Largemouth Bass
- Red Drum
- Red Snapper
- Sheepshead
- Southern Flounder
- Spanish Mackerel
- Spotted Seatrout

Fish thrown back because they were under the legal minimum length are coded as Type 3. Fish caught and used as bait during the trip are coded as Type 4. Fish thrown back or given away before being surveyed for any reason not covered by codes 3 and 4, such as too big, not wanted, etc., are coded as Type 5. Discard data is collected as per LDWF's contract with GSMFC. During the same period as provided above, staff recorded 56,440 Type 3 fish, zero Type 4 fish, and 10,536 Type 5 fish.

In addition to the dockside survey, angler effort must be determined to generate harvest estimates. LA Creel uses two separate surveys to determine angler effort. One survey targets charter captains in which 10% of almost 800 charter license holders and 30% of the approximately 108 charter license holders who also have a Recreational Offshore Landing Permit (ROLP) are drawn at random each sample week. The ROLP is a free permit required to possess tunas, billfish, swordfish, amberjacks, groupers, snappers, hinds, cobia, wahoo and dolphinfish in Louisiana waters. Gray triggerfish were added to the species list in May 2022. The purpose of the ROLP is to increase the chances of drawing anglers who fish offshore for effort surveys. One-hundred percent of ROLP holding charter captains are drawn during state and federal red snapper season. Department staff attempt to contact drawn captains to ask about the number of charter trips taken during the sample week, how many paying customers were on each trip, and what basin the trip occurred in.

During FY 2021-2022, 890 unique captains were drawn for a grand total of 6,071 times. Of those 6,071 draws, 3,668 (60%) received responses. From those responses, the estimated number of saltwater charter fishing trips taken during the period was 164,176.

The other effort survey pertains to private anglers exclusively. Each sample week, not including weeks that fall within red snapper seasons, a total of 1,600 Louisiana recreational saltwater fishing license holders are drawn at random for participation in the effort survey. Twelve hundred of the 1,600 are derived by drawing 300 licensed anglers from each of LA Creel's four regions to generate landings estimates. A separate random selection of 400 is made from ROLP holders. During red snapper seasons, the number of private ROLP anglers drawn for the effort survey increases from 400 to 800. A service contracted by LDWF is tasked with contacting drawn license holders to ask questions, such as basin fished in, number of trips taken, about any saltwater fishing trips they may have taken during the sample week.

During FY 2021-2022, a total of 285,216 contacts were made with Louisiana recreational saltwater fishing license holders for the purposes of collecting private saltwater fishing effort. After expansion, the estimated number of private saltwater fishing trips taken during the period was 1,635,573.

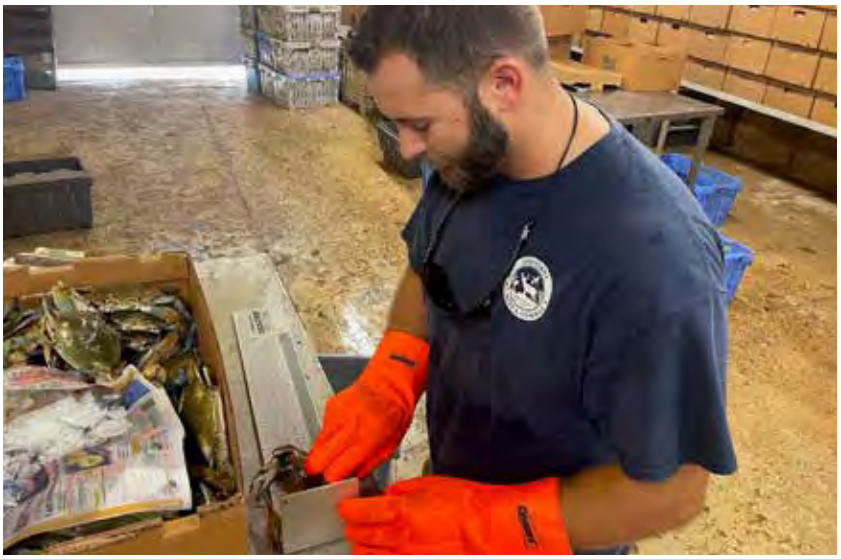
A stable version of the iPad application used for data entry of dockside surveys was released on Feb. 14, 2022, which addressed numerous functional issues.

A revised inland creel procedure was developed in 2015 in order to increase the number of completed interviews, facilitate consistent methodology across all waterbodies, and enable more accurate characterization of angler activities. A monthly creel sample schedule is generated for each waterbody designated for creel survey through the Inland Fisheries waterbody prioritization procedure. This schedule consists of a random selection of survey days for each month that district biologists follow as they conduct the surveys. Further minor revisions were added in 2020, which clarified start and end times of surveys, added counts of non-target species, and refined the ramp weighting process by observing usage in the year prior to a scheduled survey.

Creel surveys put the fisheries biologists in direct contact with the anglers. Information collected includes species sought and species caught, distance traveled, time fished, number caught and released, and length and weight measurements of all black bass and crappie harvested. Four recreational creel surveys were conducted on inland waters in 2021. The waterbodies surveyed include D'Arbonne Lake, Larto Lake, Chicot Lake and the Amite, Blind and Tickfaw rivers. Inland creel surveys

TABLE 6. Louisiana Freshwater Creel Surveys of bass and crappie anglers for calendar year 2022.

2022 CALENDAR YEAR				
	Interviews	Anglers	Average Trip Length (Hours)	Average Catch Per Trip
Largemouth Bass	649	999	4.02	1.98
Crappie	452	688	4.29	5.19
Total	**1,101**	**1,687**	**4.13**	**3.33**



Measuring blue crabs.

are used to determine average angler preferences, catch rates, and harvest rates in inland waters, which influence regulations when combined with biological data. Combined statistics for calendar year 2021 are reported in *Table 6*.

ASSESSMENT

Fisheries management involves sampling, analysis and development of recommendations to renovate and enhance fish populations. Information collected is used to evaluate the status of the fisheries through stock assessments, monitoring trends and evaluating the benefits of regulations.

STOCK ASSESSMENT

Marine

A stock assessment of spotted seatrout was completed in July 2021 and presented to the Louisiana Wildlife and Fisheries Commission in October 2021. A stock assessment of red drum began in spring of 2022 and will be completed in the fall of 2022, and presented to the Louisiana Wildlife and Fisheries Commission in late 2022. These stock assessments use statistical catch-at-age models to estimate annual time-series of spawning stock biomass and fishing mortality rates. Time-series of fishery catch-at-age along with fishery-independent relative abundance indices are the primary model inputs. Based on results of these assessments, the spotted seatrout stock is currently overfished and experiencing overfishing, whereas the red drum stock is currently not considered overfished, but is experiencing overfishing. A stock assessment of blue crab was also completed in April 2022. This stock assessment uses a catch-survey model to estimate time series of annual exploitable biomass and fishing mortality rates. Primary data inputs of this stock assessment are fishery landings and indices of abundance of blue crab juvenile and adult life stages. Based on the results of this assessment, the blue crab stock is currently not overfished without overfishing occurring.

LA Creel

The Stock Assessment Section continues to provide weekly marine recreational landings estimates from the LA Creel Survey to marine fishery managers.

Inland

Fishery-independent and fishery-dependent surveys are being conducted on Louisiana waterbodies with important

TABLE 7. Schedules of Louisiana Largemouth Bass and Crappie Stock Assessments - 34 waterbodies.

WATERBODY	LARGEMOUTH BASS ASSESSMENT	CRAPPIE ASSESSMENT
Atchafalaya Basin	2009 - 2011 2017 - 2019	
Black-Clear Lakes	2010 - 2012 2021 - 2023	
Blind River Complex	2018 - 2020	
Bundick Lake	2015 - 2017	2012 - 2014
Caddo Lake	2011 - 2013	2010 - 2012
Calcasieu River	2012 - 2014	
Cane River	2015 - 2017	
Caney Creek Reservoir	2014 - 2016	2014 - 2016
Chicot Lake	2010 - 2012 2020 - 2022	
Cross Lake	2010 - 2012 2019 - 2021	2010 - 2012
D'Arbonne Lake	2010 - 2012	2010 - 2012 2019 - 2021
False River	2010 - 2012	
Grand Bayou Reservoir	2015 - 2017	2015 - 2017
Henderson Lake	2017 - 2019	2022 - 2024
Iatt Lake	2013 - 2015	
Indian Creek Lake	2020 - 2022	2020 - 2022
Lacassine Pool NWR	2017 - 2019	
Lake Bistineau	2016 - 2018	2016 - 2018
Lake Bruin	2013 - 2015	2013 - 2015
Lake Cataouatche	2010 - 2012	
Lake Claiborne	2023 - 2025	
Lake Concordia	2010 - 2012	
Lake Fausse Point		2013 - 2015
Lakes Grassy, Verret, Palourde	2015 - 2017	
Larto-Saline Lakes	2015 - 2017	2009 - 2012
Poverty Point Reservoir	2010 - 2012 2023 - 2025	2010 - 2012 2022 - 2024
Raccourci	2015 - 2017	2009 - 2013
Red River (Pool 5)		2013 - 2015
Red River (Pools 1-5)	2013 - 2015	
Sibley Lake		2015 - 2017
Spring Bayou	2018 - 2020	2016 - 2018
Toledo Bend Reservoir	2010 - 2012 2018 - 2020	2009 - 2011
Turkey Creek Lake	2016 - 2018	2016 - 2018
Vernon Lake	2010 - 2012	2009 - 2011

Introduction graphic for LATRIP, an Inland Fisheries pilot project working with bass clubs to facilitate sharing tournament data with the public.

largemouth bass and crappie fisheries to provide information to inland fishery managers to make science-based management decisions (*Table 7*). Fishery-independent surveys are conducted for three consecutive years on each waterbody to provide population-specific information. A creel survey is conducted one of these years to provide fishery-specific information.

Inland assessment analyses include estimation of important population and fishery metrics (growth, mortality, harvest and catch rates) and the use of population models to simulate each fishery's response to size regulations. Results provide information to inland fishery managers to better understand the effects of current harvest regulations on their fisheries, while also providing a baseline to compare future regulation changes against. Final project reports are available for waterbodies with completed sampling, describing the status of each waterbody's largemouth bass (or crappie) population and fishery, as well as a comparison of population and fishery characteristics among all waterbodies included in this project.

In addition to creel activities associated with species assessments, Inland Fisheries initiated LATRIP (Louisiana Annual Tournament Report and Information Project) in order to gather and share angling data coming from bass fishing clubs active in Northwest Louisiana. This pilot project compiles voluntarily submitted largemouth bass tournament data from waterbodies throughout the northwest portion of the state into a report that is publicly available. The first report was released to the public in early 2022 and received positive feedback. Data collection for the second year of the project began in Spring/Summer 2022 and we continue recruiting other tournament organizations into the project.

Publications

West, J., E. Lang, and P. Cagle. 2022. Update Assessment of Blue Crab in Louisiana Waters - 2022 Report. Louisiana Department of Wildlife and Fisheries.

West, J., X. Zhang, T. Allgood, and J. Adriance. 2021. Update assessment of Spotted Seatrout in Louisiana Waters - 2021 Report. Louisiana Department of Wildlife and Fisheries.

MANAGEMENT PLANS

INLAND WATERBODY MANAGEMENT PLANS

Inland Waterbody Management Plans provide a detailed compilation of lake description, history, authorities, synopsis of fisheries and vegetation sampling data, analyses, corrective measures needed, and recommended actions. During FY 2020-2021, the following 23 management plans were updated and approved. A total of 80 management plans are now available to the public on the LDWF website.

Waterbody management plan updates completed during FY 2021-2022 and available to the public on the LDWF website:

- Barataria Basin
- Bayou DeSiard
- Bayou Lacombe
- Black Bayou Reservoir (Caddo)
- Blind River
- Bussey Brake Reservoir
- Calcasieu River
- Chicot Lake
- Henderson Lake
- Lake Bartholomew
- Lake Bruin
- Lake Concordia
- Lake D'Arbonne
- Lake Providence
- Larto/Saline Lakes
- Raccourci - Old River
- Spring Bayou
- Tchefuncte River
- Toledo Bend Reservoir
- Woolen Lake

INLAND VEGETATION MANAGEMENT PLANS

Inland Vegetation Management Plans provide a detailed compilation of lake description, vegetation history and current status, management limitations, implemented plant control measures, and recommended actions. During FY 2021-2022, 60 vegetation management plans were completed and/or updated, approved, and posted on our website.

MARINE FISHERY MANAGEMENT PLANS

LDWF has been developing new and updating existing fishery management plans to provide a mechanism to strategically implement science-based management recommendations for proactively responding to and resolving fisheries issues. The goal of these plans is to ensure long-term conservation and sustainable use of these fisheries resources for the maximum environmental, social and economic benefit to the state and its citizens and visitors.

- LDWF created a document to guide the development of future fishery management plans to ensure they are consistent with federal fisheries conservation and management practices and international best management practices, mainly applicable principles and standards of the United Nations Food and Agriculture Organization's Code of Conduct for Responsible Fisheries.
- Using the guidance document referenced before, LDWF previously completed new fishery management plans for spotted seatrout. Staff review new research and monitoring information for these species every year, document progress toward fishery management goals, and will fully

review and revise management plans every five years, or sooner if necessary. Currently, the shrimp fisheries management plan, southern flounder fisheries management plan, and red drum fisheries management plans are being updated. The blue crab and spotted seatrout fisheries management plans were updated and published in 2022. LDWF will prioritize development of additional new fishery management plans for other species based on commercial, recreational and ecological significance and management needs.

- These fishery management plans are also complemented by United Nations Food and Agriculture Organization-based self-assessments to document consistency with best management practices and identify any potential gaps in information or management to address in future plan updates.

MANAGEMENT RECOMMENDATIONS

Through utilization of the previously mentioned recreational and commercial sampling techniques, fisheries managers then analyze the resulting data to develop recommendations to manage and enhance fish populations. The information collected is used to produce recommendations for setting seasons and harvest limits and to monitor the species found in an area over time.

SHRIMP MANAGEMENT

Greater flexibility in managing the shrimp resource is now provided through the use of a basin type management approach, as opposed to the historical zone approach. Louisiana's major estuarine basins include the Pontchartrain Basin, Mississippi River Basin, Barataria Basin, Terrebonne Basin, Atchafalaya River Basin, Vermilion-Teche River Basin, Mermentau River Basin, Calcasieu Basin and Sabine River Basin.

Based on analysis of historical data, as well as data generated from biological sampling conducted by fisheries biologists, the following shrimp management recommendations were made to the Secretary of LDWF and the Louisiana Wildlife and Fisheries Commission. These measures were implemented during FY 2021-2022.

Lake Pontchartrain Basin and Portions of Mississippi River Basins

<u>2021 - Spring Inshore Shrimp Season</u>

Opened at 6:00 a.m. May 24, 2021, from the MS/LA state line westward to the eastern shore of South Pass of the Mississippi River.

FIGURE 5. 2021 Spring Inshore Shrimp Season Closure Map.

FIGURE 6. 2021 Fall Inshore Shrimp Season Opening Map.

Closed at official sunset June 28, 2021, in the portion of the Lake Pontchartrain Basin known as the Biloxi Marsh.

Closed at official sunset July 2, 2021, from the MS/LA state line westward to the eastern shore of South Pass of the Mississippi River except for the following areas:

- The open waters of Breton and Chandeleur Sounds.

<u>2021 - Fall Inshore Shrimp Season</u>

Opened at 6:00 a.m. Aug. 9, 2021, from the MS/LA state line westward to the eastern shore of South Pass of the Mississippi River except in the following area, which opened at 6:00 a.m. Aug. 27, 2021:

- The portion of the Lake Pontchartrain Basin known as the Biloxi Marsh.

Closed at official sunset Dec. 20, 2021, from the MS/LA state line westward to eastern shore of South Pass of the Mississippi River except for the following waters:

- Lake Pontchartrain, Chef Menteur and Rigolets Passes, Lake Borgne, Mississippi Sound, Mississippi River Gulf Outlet, a section of the Gulf Intracoastal Waterway in Orleans parish from the Gulf Intracoastal Waterway East Closure Sector Gate west-

FIGURE 7. 2022 Spring Inshore Shrimp Season Opening Map.

ward to the Gulf Intracoastal Waterway intersection with the Inner Harbor Navigation Canal, and the open waters of Breton and Chandeleur Sounds as bounded by the double-rig line described in R.S. 56:495.1(A)2.

Closed at official sunset Jan. 24, 2022, in Lake Pontchartrain, Chef Menteur and Rigolets Passes, Lake Borgne, Mississippi Sound, Mississippi River Gulf Outlet, a section of the Gulf Intracoastal Waterway in Orleans parish from the Gulf Intracoastal Waterway East Closure Sector Gate westward to the Gulf Intracoastal Waterway intersection with the Inner Harbor Navigation Canal, except for the following waters:

- The open waters of Breton and Chandeleur Sounds as described by the double-rig line described in R.S. 56:495.1(A)2.

2022 - Spring Inshore Shrimp Season

Opened at 6:00 a.m. May 16, 2022, from the MS/LA state line westward to the eastern shore of South Pass of the Mississippi River except in the following area, which opened at 6:00 a.m. May 23, 2022:

- The portion of the Lake Pontchartrain Basin known as the Biloxi Marsh.

Closed at official sunset, June 30, 2022, from the MS/LA state line westward to the eastern shore of South Pass of the Mississippi River except for the following areas:

- The open waters of Breton and Chandeleur Sounds as bounded by the double-rig line described in R.S. 56:495.1(A)2.

Western Mississippi River, Barataria, Terrebonne, Atchafalaya River and Vermilion-Teche River Basins

2021 - Spring Inshore Shrimp Season

Opened at 6:00 a.m. May 24, 2021, from the eastern shore of South Pass of the Mississippi River westward to the western shore of Freshwater Bayou Canal.

Closed at official sunset July 2, 2021, from the eastern shore of South Pass of the Mississippi River westward to the western shore of Freshwater Bayou Canal.

2021 - Fall Inshore Shrimp Season

Opened at 6:00 p.m. Aug. 9, 2021, from the eastern shore of South Pass of the Mississippi River westward to the Atchafalaya River Ship Channel Buoy Line.

Opened at 6:00 a.m. Aug. 9, 2021, from the Atchafalaya River Ship Channel Buoy Line westward to the western shore of Freshwater Bayou Canal.

Closed at official sunset Dec. 20, 2021, from the eastern shore of South Pass of the Mississippi River westward to the western shore of Freshwater Bayou Canal.

2022 - Spring Inshore Shrimp Season

Opened at 6:00 a.m. May 9, 2022, from the eastern shore of South Pass of the Mississippi River westward to the western shore of Freshwater Bayou Canal.

Closed at official sunset, June 30, 2022, from the eastern shore of South Pass of the Mississippi River westward to the western shore of Freshwater Bayou Canal.

Mermentau, Calcasieu and Sabine River Basins

2021 - Spring Inshore Shrimp Season

Opened at 6:00 a.m. May 24, 2021, from the western shore of Freshwater Bayou Canal westward to the LA/TX state line.

Closed at official sunset July 2, 2021, from the western shore of Freshwater Bayou Canal to the LA/TX state line.

2021 - Fall Inshore Shrimp Season

Opened at 6:00 a.m. Aug. 9, 2021, from the western shore of Freshwater Bayou Canal westward to the LA/TX state line.

Closed at official sunset Dec. 20, 2021, from the western shore of Freshwater Bayou Canal westward to the LA/TX state line.

2022 - Spring Inshore Shrimp Season

Opened at 6:00 a.m. May 23, 2022, from the western shore of Freshwater Bayou Canal westward to the LA/TX state line except in the following area, which opened at 6:00 a.m. May 28, 2022:

- The Mermentau River.

Closed at official sunset, June 30, 2022, from the western shore of Freshwater Bayou Canal westward to the LA/TX state line.

Offshore Shrimp Seasons

Closed at official sunset Jan. 24, 2022, in the following waters:

- The portions of state outside waters between Caillou Boca and Freshwater Bayou Canal. The eastern boundary line originates on the northwest shore of Caillou Boca at 29 degrees 02 minutes 46 seconds north latitude, -90 degrees 50 minutes 27 seconds west longitude and ends at a point on the three mile line as described in R.S. 56:495(A) at 28 degrees 59 minutes 30 seconds north latitude, -90 degrees 51 minutes 57 seconds west longitude. The western boundary line originates on the western shore of Freshwater Bayou Canal at 29 degrees 32 minutes 03 seconds north latitude, -92 degrees 18 minutes 33 seconds west longitude and ends at a point on the three mile line as described in R.S. 56:495(A) at 29 degrees 29 minutes 02 seconds north latitude, -92 degrees 19 minutes 34 seconds west longitude

Opened at 6:00 a.m. April 4, 2022, in the following waters:

- The portion of state outside waters between Caillou Boca and Mound Point on Marsh Island. The eastern boundary line originates on the northwest shore of Caillou Boca at 29 degrees 02 minutes 46.00 seconds north latitude, -90 degrees 50

minutes 27.00 seconds west longitude and ends at a point on the three-mile line as described in R.S. 56:495(A) at 28 degrees 59 minutes 30.00 seconds north latitude, -90 degrees 51 minutes 57.00 seconds west longitude. The western boundary line originates on the inside/outside line at the southernmost point of Mound Point on Marsh Island at 29 degrees 28 minutes 28.30 seconds north latitude, -91 degrees 49 minutes 19.00 seconds west longitude and ends at a point on the three-mile line as described in R.S. 56:495(A) at 29 degrees 22 minutes 01.67 seconds north latitude, -91 degrees 49 minutes 19.00 seconds west longitude.

Opened at 6:00 a.m. April 25, 2022, in the following waters:

- The portion of state outside waters between Mound Point on Marsh Island and the western shore of Freshwater Bayou Canal. The eastern boundary line originates on the inside/outside line at the southernmost point of Mound Point on Marsh Island at 29 degrees 28 minutes 28.30 seconds north latitude, -91 degrees 49 minutes 19.00 seconds west longitude and ends at a point on the 3-mile line as described in R.S. 56:495(A) at 29 degrees 22 minutes 01.67 seconds north latitude, -91 degrees 49 minutes 19.00 seconds west longitude. The western boundary line originates on the western shore of Freshwater Bayou Canal at 29 degrees 32 minutes 03.00 seconds north latitude, -92 degrees 18 minutes 33.00 seconds west longitude and ends at a point on the three mile line as described in R.S. 56:495(A) at 29 degrees 29 minutes 02.00 seconds north latitude, -92 degrees 19 minutes 34.00 seconds west longitude.

Derelict crab trap removal.

BLUE CRAB MANAGEMENT

The Louisiana blue crab fishery is the largest blue crab fishery in the United States and it accounts for more than three quarters of the total blue crab harvest in the Gulf of Mexico. Landings of blue crab in Louisiana averaged 44.6 million pounds annually (fiscal year) from 2000-2022. The dockside value of the harvest over that same time period averaged $42.3 million annually (prices not adjusted for inflation).

Management of the blue crab fishery strives for the maintenance of the stock while providing for long-term benefits to the fishery. Key objectives of management include:

- Conservation, restoration and enhancement of habitat essential to blue crabs.
- Reductions in juvenile blue crab incidental mortality, wasteful harvesting practices within the fishery, and conflicts among crab fishermen and other user groups.
- Enhancement of social and economic benefits derived from resource use.
- The assessment of biological, social and economic impacts of existing and proposed fisheries management regulations affecting the fishery.

These objectives are met via licensing, record keeping and reporting requirements, minimum size limit, time, gear and area restrictions.

Blue Crab Stock Assessment

The most recent stock assessment for blue crab was in early 2022. Model estimates in 2022 confirmed that the Louisiana blue crab stock is currently not overfished or experiencing overfishing.

Blue Crab Stock Legislation

During the 2021 Legislative Regular Session, Senate Resolution 105 was drafted in order for the Louisiana Shrimp Task Force and the Louisiana Crab Task Force, with guidance from LDWF, to discuss recommendations to reduce the amount of lost and derelict crab traps caused by nighttime shrimping in Lake Pontchartrain. Recommendations to the Louisiana Legislature was due on Feb. 4, 2022.

Before the Feb. 4, 2022 deadline, the shrimp and crab task force representatives met and discussed Senate Resolution 105. A determination by both task force boards was made and a letter was drafted requesting that no additional regulation be placed on the shrimpers in Lake Pontchartrain.

Derelict Crab Trap Removal Program

The removal of derelict crab traps from fishing grounds reduces navigational risks to boaters and threats to public safety while reducing mortality of incidental species captured in traps, potentially increasing the number of crabs available for harvest by preventing crab mortalities in abandoned, out-of-use traps.

***TABLE 8.** Number of crab trap closures and numbers of traps removed annually.*

YEAR	AREA(S)	TRAPS
2004	2	6,894
2005	4	4,623
2006	1	2,935
2007	2	1,495
2008	1	1,234
2009	1	788
2010	1	477
2011	1	1,100
2012	2	2,798
2013	2	969
2014	1	1,051
2015	1	422
2016	3	2,580
2017	6	5,674
2018	5	4,061
2019	5	4,041
2020	6	4,188
2021	4	5,163
2022	4	815
Total	***52***	***51,308***

***TABLE 9.** Average annual number of traps removed.*

YEAR	AREA(S)	AVG. TRAPS
2004-2005	6	5,758
2006-2016	16	1,441
2017-2022	30	3,990

In 2021, the Louisiana Wildlife and Fisheries Commission promulgated a rule defining four distinct derelict crab trap closure areas for 2022. The closure areas and dates were as follows:

1. The first closure took place in the Terrebonne Basin, in an area southwest of Dularge, from 12 a.m. Tuesday, Feb. 1, 2022, through 11:59 p.m. Monday, Feb. 14, 2022.
2. The second closure took place in the Vermilion Basin, in an area between the Acadiana Navigational Channel and East Cote Blanche Bay, from 12 a.m. Tuesday, Feb. 1, 2022, through 11:59 p.m. Monday, Feb. 14, 2022.
3. The third closure took place in the Barataria Basin, in an area south of Lafitte, from 12 a.m. Monday, Feb. 7, 2022, through 11:59 p.m. Sunday, Feb. 20, 2022.
4. The fourth closure took place in the Calcasieu Basin, in the West Cove portion of Calcasieu Lake, from 12 a.m. Friday, Feb. 18, 2022, through 11:59 p.m. Wednesday, Feb. 23, 2022.

A volunteer day was scheduled to take place on Saturday, Feb. 6, 2021, in the Terrebonne Basin, but was canceled due to COVID-19.

Two volunteer days were scheduled: one in the Barataria Basin and one in the Calcasieu Basin. Both cleanups were headed by LDWF with one being staged at the Jean Lafitte Harbor in Lafitte, Louisiana, and the other at the Sabine National Wildlife Refuge West Cove Public Launch. Approximately 75 volunteers, including 14 vessels, from Jean Lafitte Harbor, the Coastal Conservation Association of Louisiana, Jefferson Parish Ecosystem and Coastal Management Department, Barataria-Terrebonne National Estuary Program, LSU students, members of the fishing community, Nicholls State University, and Southwest Louisiana Master Naturalists worked with LDWF personnel to collect nearly 500 traps during the two events. The events would have not been as successful without the help from our sponsors:

- Fenstermaker
- Jean Lafitte Harbor

Since the inception of the program in 2004, LDWF and volunteers have removed over 51,000 derelict or abandoned crab traps from state waters (*Table 8*). The largest numbers of traps removed from state waters came during the program's first two years. From 2006-2016 the number of closure areas was reduced to focus on one area at a time, which resulted in fewer traps being removed annually. Since 2017, the abandoned crab trap program has expanded with more closure areas annually and the amount of traps removed has greatly increased (*Table 9*). During the 11-year period (2006-2016), the annual derelict crab traps removed averaged over 1,400, while more recent years indicate an average of nearly 4,000.

OYSTER MANAGEMENT

Oysters provide both important economic and ecological benefits to Louisiana. They act as barometers for the overall health of the ecosystem, providing forage and shelter habitat for a variety of fish and invertebrate species. Oysters improve water quality through filter-feeding activities, affect estuarine current patterns and may provide shoreline stabilization. Due to their economic and ecological importance, wise management of the public oyster resource is critically important to ensure that this valuable species continues to thrive in Louisiana's coastal areas.

The Office of Fisheries Mollusk Program is responsible for the oyster resource on nearly 1.7 million acres of public oyster seed reservations, public seed grounds and public oyster areas. Seed grounds are designated by the Louisiana Wildlife and Fisheries Commission and include a large continuous area east of the Mississippi River as well a portion of the Vermilion/Cote Blanche/Atchafalaya Bay system. Seed reservations and the public oyster areas of Calcasieu and Sabine lakes are designated by the legislature. LDWF manages four seed reservations, including one east of the Mississippi River (Bay Gardene), one in the Barataria Bay system (Hackberry Bay) and two in Terrebonne Parish (Sister Lake and Bay Junop).

State laws allow LDWF to open the oyster season on Louisiana public seed grounds on the first Wednesday following Labor Day of each year and close areas no later than April 30 of the following year. However, the Louisiana Wildlife and Fisheries Commission is authorized to extend the season beyond April 30, provided sufficient stocks are available for harvest. The Secretary of LDWF may close seasons or areas as needed, based on biological data or enforcement related issues; is authorized to take emergency action to reopen areas previously closed if the threat to the resource has ended and areas have substantial oyster resources remaining; and can delay openings or close areas showing significant spawning events. Management practices often use rotational openings of the four Oyster Seed Reservations in alternating years. The Oyster Public Seed Grounds may be opened

***TABLE 10.** 2021-2022 Public oyster area season dates and estimated harvest based on biologists' surveys of oyster boats and dealer calls.*

2021-2022 LDWF OYSTER SEASON SUMMARY						
CSA	Area	Season Opening	Season Closure	Season/Type	Days Open	Harvest (Sacks)
1	POSG East of Mississippi River and North of MRGO	CLOSED				
	POSG East of Mississippi River and South of MRGO	CLOSED				
3	Hackberry Bay	CLOSED				
	Little Lake, Barataria Bay	CLOSED				
5	Deep Lake, Lake Chien, Lake Felicity and Lake Tambour	CLOSED				
	Bay Junop, Lake Mechant	CLOSED				
	Sister Lake	Oct. 25	Oct. 25	Seed Harvest	1	1,105 bbls
		Oct. 26	Oct. 29	Market Harvest	4	1,334 sacks
		March 7	March 10	Market Harvest	4	2,764 sacks
		March 21	March 23	Market Harvest	3	2,147 sacks
6	Vermilion Bay	CLOSED				
7	Calcasieu Lake	Nov. 1	April 30	East Side: Market Harvest	181	3,437 sacks
		Nov. 1	April 30	West Cove: Market Harvest	181	9,941 sacks

to the harvest of seed oysters for bedding purposes between the first Wednesday following Labor Day and the second Monday in October; after which the public grounds may be opened to harvest of market-size oysters.

The goal for the 2021-2022 oyster season to reduce harvest stress on the resource, allowing for continued recovery, while using thresholds from the shell budget model in most basins. Calcasieu Lake was managed where harvest closes once it reaches 15% of the total available resource from the annual oyster stock assessment. Details of the 2021-2022 oyster season can be found in *Table 10*.

Total commercial harvest was estimated to be 1,105 barrels of bedding oysters (seed) and 19,623 sacks of market-sized oysters for and overall total of 10,916 bbl. oysters (2 sacks = 1 bbl.). Harvest estimates were based on LDWF oyster boarding reports and calls to dealers. 2021-22 harvest reflected a 3,082% increase from the 2020-2021 oyster season.

Oyster Cultch Plant and Brood Reef Projects

All reef construction, water bottom assessment, and reef monitoring were funded through Deepwater Horizon Natural Resource Damage Assessment settlement dollars to help restore for injuries to oysters that occurred as a result of the spill. The Louisiana Trustee Implementation Group approved 26 million dollars in oyster projects, including enhancing oyster recovery using brood reefs, cultch-plant oyster restoration, and hatchery-based oyster restoration.

LDWF completed a 200-acre cultch plant project in Sister Lake (Terrebonne Parish). The (Natural Resource Damage Assessment) Sister Lake Cultch Plant monitoring consists of conducting dredge tows in the spring, fall, and winter and quarter-meter square sampling in the summer. In addition, four 10-acre Natural Resource Damage Assessment brood reefs located at Petit Pass, Karako Bay, Lake Machias, and Mozambique Point (Plaquemines and St. Bernard Parishes), were constructed in the fall of 2021; sample baskets were deployed in December 2021 on each reef and on adjacent substrate devoid of rock riprap and are to be monitored quarterly to characterize reef performance. These oyster projects are among the first projects included in LDWF's "Louisiana Oyster Management and Rehabilitation Strategic Plan" to be initiated.

MARINE FINFISH MANAGEMENT

The primary objective of the finfish program is to make rational recommendations for the management of coastal finfish stocks based on a database of scientific information. The information in the database is collected through fishery-independent and fishery-dependent sampling.

The following management recommendations were made to the Secretary of LDWF and the Louisiana Wildlife and Fisheries Commission and implemented during FY 2021-2022:

July 2021

- Commercial king mackerel season opened on July 1 at 12:01 a.m., concurrent with a federal opening of the 2021-2022 harvest season.
- Commercial fisheries for small coastal sharks and large coastal sharks re-opened July 1 following an annual seasonal closure from April 1 - June 30.

August 2021

- Louisiana waters reopened for the commercial and recreational harvest of gray triggerfish on Aug. 1, 2021, concurrent with an opening in federal waters.
- Louisiana waters opened to the commercial harvest of pompano with strike nets on Aug. 1, 2021.

September 2021

- Louisiana waters and federal waters off Louisiana closed to the private recreational and state charter harvest of red snapper on Monday, Sept. 5, 2021.
- Louisiana waters closed to the recreational harvest of gray triggerfish on Sept. 15, 2021, concurrent with a closure in federal waters.
- Louisiana waters closed to the recreational harvest of red grouper on Sept. 15, 2021, concurrent with a closure in federal waters.
- Louisiana waters and federal waters off Louisiana re-opened daily to the private recreational and state charter harvest of red snapper on Friday, Sept. 24, 2021 at a four fish bag limit.

October 2021

- Louisiana waters closed to the recreational and commercial harvest of lane snapper on Oct. 18, 2021, concurrent with a closure in federal waters.
- Louisiana waters opened to the commercial harvest of striped mullet with a mullet strike net on Oct. 18, 2021
- Louisiana closed state waters for the commercial harvest of greater amberjack on Oct. 31, 2021.
- Louisiana waters closed to the harvest of pompano with strike nets on Oct. 31, 2021.
- A Notice of Intent was adopted by the Louisiana Wildlife and Fisheries Commission to add coastal buffer zones to Gulf menhaden harvest regulations.

November 2021

- Louisiana waters closed to the commercial harvest of Gulf menhaden on Nov. 1, 2021
- Louisiana waters opened to the commercial harvest of bait menhaden on Nov. 2, 2021

December 2021

- Louisiana waters closed to the commercial harvest of bait menhaden on Dec. 1, 2021.
- Louisiana waters closed for the commercial harvest of large and small coastal sharks on Dec. 31, 2021, concurrent with a closure in federal waters.
- Louisiana waters closed for the commercial fishery for the harvest of spotted seatrout closed on Dec. 31, 2021.
- Louisiana waters and federal waters off Louisiana closed to the private recreational and state charter harvest of red snapper on Dec. 31, 2021.

January 2022

- Louisiana waters opened to the commercial harvest of small and large coastal sharks opened on Jan. 1, 2022, concurrent with an opening in federal waters.
- Louisiana waters closed to the recreational harvest of gag grouper on Jan. 1, 2022, concurrent with a closure in federal waters.
- Louisiana waters opened to the commercial and recreational harvest of lane snapper on Jan. 1, 2022, concurrent with an opening in federal waters.
- Louisiana waters closed to the recreational harvest of gray triggerfish on Jan. 1, 2022, concurrent with a closure in federal waters.
- Louisiana waters opened to the commercial harvest of spotted seatrout on Jan. 2, 2022.
- The Louisiana Wildlife and Fisheries Commission adopted a Notice of Intent to modify Recreational Offshore Landing Permit regulations by increasing the age requirement to 18 and older and adding

gray triggerfish to the list of species for which the permit is required.
- The Louisiana Wildlife and Fisheries Commission amended a previously adopted Notice of Intent for Gulf menhaden coastal buffer zones to not include Breton and Chandeleur sounds.
- Louisiana waters closed to the commercial harvest of striped mullet with a mullet strike net on Jan. 18, 2021.

February 2022
- The annual stock assessment for striped mullet was presented to the Louisiana Wildlife and Fisheries Commission for transmittal to the Louisiana Legislature.

March 2022
- Louisiana waters opened to the recreational harvest of gray triggerfish on March 1, 2022, concurrent with an opening in federal waters.
- Louisiana waters closed to the commercial harvest of greater amberjack on March 1, 2022, concurrent with a closure in federal waters.
- The Louisiana Wildlife and Fisheries Commission adopted a Notice of Intent to set an annual closed season for the commercial and recreational harvest of southern flounder from Oct. 15 - Nov. 30 of each year.
- Possession limits of commercially harvested large coastal sharks in Louisiana waters increased from 45 to 55 daily on March 10, 2022, concurrent with an increase in federal waters.
- Louisiana waters opened for the commercial harvest of bait Gulf menhaden on March 14, 2022.

April 2022
- Louisiana waters closed to the recreational and commercial harvest of all sharks on April 1, 2022, consistent with an annual state closed season from April 1 - June 30.

May 2022
- Louisiana waters opened to the recreational harvest of greater amberjack from May 1-31, 2022.
- A rule adopted by the Louisiana Wildlife and Fisheries Commission modifying the Recreational Offshore Landing Permit age requirement and adding gray triggerfish to the list of species for which the permit is required published as final.
- Louisiana waters and federal waters off Louisiana opened on May 27, 2022, for the private recreational and state charter harvest of red snapper during weekends only (Friday, Saturday and Sunday), including the Mondays of Memorial Day, Independence Day and Labor Day at a three fish per person bag limit.

June 2022
- Louisiana waters closed for the recreational and commercial harvest of gray triggerfish on June 1, 2022, concurrent with a seasonal closure in federal waters.
- Louisiana waters opened for the recreational harvest of gag on June 1, 2022, concurrent with a seasonal opening in federal waters.
- A rule adopted by the Louisiana Wildlife and Fisheries Commission modifying Gulf menhaden harvest regulations by adding coastal buffer zones published as final.

FISHERIES RESEARCH

GRAND ISLE LABORATORY

The Fisheries Research Lab is located in Grand Isle on the shore of Barataria Bay, one of the richest estuarine complexes in the Gulf of Mexico. While fisheries research and monitoring is conducted throughout the state, the Fisheries Research Lab is the base for much of this work within the Office of Fisheries. This ideal location allows for the research and monitoring of many of Louisiana's key recreational and commercial marine species, including offshore species that are just a short boat ride away. The Fisheries Research Lab provides fisheries biologists with the resources to develop and conduct additional research projects, collecting vital information for the management of Louisiana's marine resources. Along with being a home-base for fisheries research projects, the lab also serves as a place that public, state and federal partners can utilize, as well as other entities engaged in fisheries research, management, enforcement, coastal restoration and marine education.

Southeast Area Monitoring and Assessment Program (SEAMAP)

SEAMAP is a cooperative state, federal and university program designed for the collection, management and dissemination of fishery-independent biological and environmental data of the coastal waters (state and Exclusive Economic Zone) off the southeastern United States, Caribbean and northern Gulf of Mexico. Since 1981, SEAMAP has collected data on fish stocks that are managed by either state or federal governments. Louisiana takes part in four components of the SEAMAP program: shrimp/groundfish, icthyoplankton, vertical line and bottom longline. The surveys are conducted by teams of three to nine fisheries biologists who collect, process and enter data. In addition, all surveys collect environmental parameters including a water column profile and water samples from bottom, middle and surface depths for chlorophyll measurements. These surveys are conducted from April through October and the following summaries are based on the calendar year.

SEAMAP Shrimp/Groundfish Survey

The SEAMAP Shrimp/Groundfish Survey collects information to characterize shrimp and groundfish assemblages west of the Mississippi River using a SEAMAP standardized 42-foot trawl in nearshore waters along the Louisiana coast. Shrimp/Groundfish Surveys are conducted during the summer and fall, and stations are selected from the SEAMAP randomized sampling grid. At least 16 trawl stations are selected by LDWF for each survey. Additional stations are added as feasible. Species are identified, counted, measured, weighed and recorded; these data are submitted to the SEAMAP data management system, and data are transmitted to National Marine Fisheries Service for near real-time reporting and monitoring of summer shrimp stocks. In 2022, a total of 37 trawl surveys were conducted by LDWF personnel in depths ranging from 10 to 105 meters between longitudes 92.1° - 89.4°.

SEAMAP Icthyoplankton Survey

The SEAMAP Icthyoplankton Survey is conducted annually to provide information on the occurrence, abundance and geographical distribution of the eggs and larvae of fall spawning fish, particularly king and Spanish mackerel. LDWF participates in the fall icthyoplankton survey and stations are selected from the National Marine Fisheries Service icthyoplankton grids. Sampling is conducted using 60-cm bongo nets and 1x2 m neuston nets. Samples are field processed, preserved and transferred to the National Marine Fisheries Service Pascagoula Laboratory for transshipment to the Polish Sorting and Identification Center. Six of seven scheduled stations were sampled in 2022, with all samples being successfully preserved and submitted to the National Marine Fisheries Service.

SEAMAP Vertical Line Survey

The SEAMAP Vertical Line Survey is conducted from June to October to collect information on the spatial and temporal distribution of commercial and recreational reef species off the Louisiana coast. Sampling stations are drawn from a pre-established sampling universe provided by the Gulf States Marine

Fisheries Commission and includes petroleum platforms, artificial reefs, and natural bottom sites in depths ranging from 60 to 360 feet. The sampling universe encompassed sites form the South Pass of the Mississippi River to the TX/LA border (-89.00°- -94.00°). Vertical line sampling is completed using commercial bandit gear equipped with three hook sizes (8/0, 11/0, 15/0). Fishes encountered are identified to species, and total length, weight, sex and the size of the hook on which the fish was caught are recorded. Otoliths and tissues of select reef species are removed and processed when necessary.

Following the conclusion by the SEAMAP Data Management Subcommittee to not include Vertical Line Survey data in reef fish stock assessments, the SEAMAP Subcommittee came to agreement to suspend the Vertical Line Survey following the 2022 sampling season in preference for adopting a reef fish video survey. In June, 2022, Louisiana opted out of continuing its component of the Vertical Line Survey, instead focusing efforts on developing methodologies for a stereo camera reef fish survey. Prior to this, Fisheries Research Lab staff completed 10 assigned vertical line stations in Louisiana's waters.

SEAMAP Bottom Longline Survey

The SEAMAP Bottom Longline Survey collects information on the abundance and distribution of elasmobranchs and bottom feeding species with standard 1 nautical mile longline sets. Data are utilized in Gulf of Mexico stock assessments to establish harvest limits for commercial and recreational harvest of elasmobrnachs. Stations are generated by Gulf States Marine Fisheries Commission, in which bottom longline stations are proportionally allocated by longitude and depth based on the width of the continental shelf within depths of 10 meters. The annual stations are divided with the intent of sampling the entire Louisiana coast once per season (spring, summer, fall) during the months of April through September. All species are recorded, counted and measured for length(s), weight and sex (sharks). Sharks selected for tagging are tagged with dart or metal tag prior to their release to collect biological and life history information. Otoliths of select state-managed species are removed and processed.

LDWF completed 78 of 93 assigned longline sets in Louisiana's territorial waters between April 28, 2022 and Sept. 13, 2022. Longline efforts resulted in 1,520 captures, of which elasmobranchs composed 34.8 % of the catch and teleosts composed the remaining 65.2%of the catch. The most frequently captured sharks included blacktip shark (20.3% of total catch) followed by bull shark (7.0%). A total of 155 sharks were tagged and released, and otoliths from 11 red drum were collected to contribute to LDWF red drum life history research.

Fisheries Research Projects

Life History of Louisiana Sport Fish

Collecting life history and reproductive metrics (age, growth, fecundity) for Louisiana's state-managed sport fishes is critical for informing sound management decisions. To supplement data collected from fish harvested in Louisiana's commercial and recreational fisheries, LDWF biologists conduct fisheries-independent sampling using standardized gears. Target species for life history studies rotate annually with efforts focused on red drum and spotted seatrout during the reporting period.

Samples collected for life history studies include otoliths from all individuals and ovaries from females. Ovaries are fixed in buffered formalin and processed for histological analysis at the Fisheries Research Lab. Spawning markers are identified under stereoscope, and spawning metrics including spawning frequency and fecundity are recorded. Metrics such as age, growth, spawning fraction, spawning frequency and fecundity are used both as inputs for stock assessment and as proxies for the health of the spawning stock.

Spotted seatrout were collected using gill nets placed near shore and allowed to passively capture spotted seatrout for hour long soak periods. Upon collection fish were processed within 24 hours to maintain integrity of the ovaries. During the sampling period a total of 166 individuals were collected ranging from 24 to 56 centimeters with 27 individuals in the 42 centimeter range.

Red drum life history sampling occurred during bottom longline offshore sampling opportunistically and were also targeted on red drum specific bottom long lines. Red drum long lines consisted of the same setup as above bottom longline methods using blue crab as bait material and smaller hooks to target red drum. Targeted bottom long lines for red drum were limited due to weather constraints. Mature red drum were collected during bottom longline sampling but none were collected during targeted long line sets.

Southern Flounder Abundance

Southern flounder stocks are declining from the Gulf of Mexico to the Atlantic coast. Because southern flounder do not recruit to standardized sampling gears such as gill nets and trammel nets they are rarely encountered in Louisiana's fishery-independent surveys. To better monitor Louisiana's southern flounder stock, LDWF biologists have established an experimental study to assess the effectiveness of modified fyke nets as a standardized gear for sampling southern flounder from Louisiana's coastal waters. Identifying effective gears for sampling southern flounder outside of typical harvest seasons and during the spawn can increase data availability to improve stock assessments and LDWF's ability to monitoring the flounder population.

To date, several net types have been deployed in passes and behind barrier islands in Barataria Bay during winter months (October through January) when southern flounder migrate offshore to spawn. Ultimately, a modified box frame fyke net with 2.5 m wings has been identified as the most effective passive net gear for sampling southern flounder. In addition to identifying a successful standardized fisheries-independent survey method, gonads and otoliths are collected from flounder to supplement stock assessments. In 202-2022 a total of 194 pairs of otoliths were sampled along with 144 gonads. Ageing and histological analysis of these samples are ongoing.

Barotrauma

Barotrauma is a common injury that occurs to fish that are captured at depth and are rapidly brought to the surface, resulting in gas expansion from the swim bladder causing a bloated appearance distended eyes and sometimes everted stomachs. This injury can cause the fish to become an easy prey item if released at the surface due to its impact on swimming and predator evasion. A way to reverse the effects of barotrauma is to release the fish at depth via a controlled descent. For this study fish are captured via traditional rod and reel methods, biological data is collected and fish are returned to capture depth using a fish descender device (SeaQualizer) which is preloaded to release at the determined depth. To study the release conditions and any interactions the fish may have returning to depth, GoPro cameras are mounted above and below to record the events.

Approximately 100 red snappers have been collected and released using the descending device and video of the releases are currently in processing.

AGE & GROWTH LABORATORY

The collection of age, growth and reproductive information used to develop age-structured stock assessments is coordinated through the LDWF Age and Growth Laboratory in Baton Rouge. The Age and Growth Lab monitors 16 species of fish. Monitoring is done through the collection of otoliths and spines (gray triggerfish) for aging purposes. Coastal study area biologists record length, weight, gender and location when fish are collected in the field. The 16 fish species consist of 13 saltwater and three freshwater species. The freshwater species are black crappie, white crappie and largemouth bass. The saltwater species are black drum, cobia, gray snapper, greater amberjack, gray triggerfish (spines), king mackerel, red drum, red snapper, sheepshead, southern flounder, spotted seatrout, striped mullet and vermilion snapper. Yellowfin tuna and wahoo are sampled by Fisheries Research biologists and considered fishery research species. Since 2015, LDWF Fisheries Research staff have been Gulf of Mexico-wide leaders in yellowfin tuna processing protocol and aging. Opportunistic samples of wahoo have led to age and growth model estimations and a maturity ogive. As of January 2019, saltwater otoliths/spines are obtained by fisheries independent sampling in addition to fisheries dependent sampling. Dependent sampling requires field marine biologists to collect the otolith or spine when they interview a recreational angler, and also includes interviewing commercial fishermen at commercial fishing docks. Independent sampling, requires field biologists to target a particular species. Freshwater otoliths are obtained through independent sampling. The lab receives otoliths (and spines) throughout each month of the year.

During FY 2021-2022, the Age and Growth Lab in Baton Rouge received 12,202 otoliths, of which 11,791 have been aged. Within that total, 2,017 otoliths were saltwater fisheries independent, of which 1,762 were aged and 723 otoliths were freshwater, of which 720 were aged. Spotted seatrout was the most collected species out of any marine or inland species because quotas for spotted seatrout are the highest and it is very popular among anglers. The totals for each species are listed in *Table 11*.

The season for striped mullet and black and white crappie collection is typically during the fall. Largemouth bass sampling is mostly done during the spring and early summer months. The number of freshwater otoliths decreased when compared to last year, primarily due to the collection of fewer largemouth bass and black crappie.

The 2021 otolith sampling quotas were maintained through FY 2021-2022. The number of marine otoliths decreased slightly when compared to last year's numbers, primarily due to reduced harvest of black drum, gray snapper and sheepshead. All otoliths received during this time period have been processed, meaning they were cataloged, sectioned, first and second read and data was entered into DMS.

During FY 2021-2022, the Age and Growth Lab received the reference sets for sheepshead, red drum, striped mullet and spotted seatrout. Distribution of reference sets has resumed and it is anticipated all sets will be reviewed before the anticipated Gulf States Marine Fisheries Commission Otolith Processor's Workshop in 2023. The workshop was not held in 2022. The reference sets are used to help sharpen Age and Growth biologists' otolith aging skills and control bias over time. The sets are also used to ensure all labs base their ages on the correct criteria.

INLAND RESEARCH

Many issues that Inland Fisheries biologists face require laboratory and field research to validate current techniques, investigate new methods of resource management and prioritize management actions across Louisiana's freshwater ecosystem.

Florida Largemouth Bass Genetics

LDWF Inland Fisheries has worked closely with LSU AgCenter to determine the genetic composition of selected largemouth bass populations in the state. The data is used to manage hatchery stocks, assess the relative mortality of native, Florida and hybrid largemouth bass, and assess the introgression of Florida largemouth bass genes into Louisiana bass populations resulting from continuing stocking efforts by LDWF. From July 2021 to June 2022, 203 largemouth bass were tested for sub-species identification, with >90% northern or Florida genetics being classified as pure, and those with <90% northern or Florida genetics being classified as hybrid. These fish were from Cross Lake, Black and Clear Lakes, and Chicot Lake (*Table 12*). Genetic methods were recently updated to utilize microsatellite analysis.

***TABLE 11.** Saltwater and freshwater fish otoliths collected and aged.*

SPECIES	COLLECTED	AGED
Black Crappie	232	231
Black Drum	1,169	1,157
Cobia	9	9
Gray Snapper	83	81
Gray Triggerfish	8	8
Greater Amberjack	32	32
King Mackerel	0	0
Largemouth Bass	312	311
Red Drum	2,603	2,580
Red Snapper	1,014	977
Sheepshead	1,058	1,033
Southern Flounder	798	599
Spotted Seatrout	4,427	4,331
Striped Mullet	225	224
Vermilion Snapper	50	50
White Crappie	179	178

Removing otoliths from fish.

TABLE 12. Largemouth bass tested for sub-species identification in FY 2021-2022.

LOCATION	NUMBER				PERCENT			DATE SAMPLED	DISTRICT
	NORTHERN	HYBRID	FLORIDA	TOTAL	NORTHERN	HYBRID	FLORIDA		
Cross Lake	41	18	1	60	68.3	30	1.7	March 2021	1
Black and Clear Lakes	53	7	0	60	88.3	11.7	0	April 2021	10
Chicot Lake	15	62	5	83	18.3	75.6	6.1	September 2020	6
TOTAL				***203***					

American Eel Age and Growth

American eels have been studied very little along the coast of the Gulf of Mexico, which has lead Inland Fisheries biologists to research the life history of eels found in Louisiana. Inland Fisheries District 5 staff began a State Wildlife Grant for American eel life history information since November 2017. In FY 2021-2022, the final report was completed, and results were presented at professional conferences. Four-hundred-twenty eels were processed for the project. The parameters collected include length, weight, stomach contents, sex determination, presence of the swim bladder parasites *Anguillicoloides crassus* and removal of otoliths and tissue for DNA. Aging otoliths provided the ages for 301 specimens, with the oldest eel being 16 years. Staff found 104 specimens from 20 different sites that contained the parasite *A. crassus*. This study will provide the department with much needed information on American eels for future management considerations, and aid in regional and range-wide assessments.

Status Survey for Bluenose Shiner in the Pearl River Drainage

During the summer 2021 and 2022, Inland Fisheries biologists conducted surveys at locations throughout the Pearl River basin to determine presence/absence and provide relative abundance estimates for the bluenose shiner and overall fish community. Surveys were conducted at historic sites and at previously unsampled habitat-appropriate locations within the known range in an attempt to expand the species' known range. Results will inform Federal resource partners on possible management needs for this focal species.

Native Vegetation Establishment in Toledo Bend Reservoir

Toledo Bend Reservoir historically contained large quantities of submersed aquatic vegetation that contributed to healthy bass and crappie populations. Following the record flooding experienced in March 2016 and September 2017, aquatic vegetation coverage in the lake has been minimal. Decreasing amounts of fishery habitat throughout the reservoir from 2016 through 2020 prompted a habitat research study by LDWF. The goals were to determine if herbivory is a factor in preventing regrowth of emergent and submersed vegetation, to see if there is a viable aquatic vegetation seed source, to evaluate aquatic vegetation plantings from localized stock, and to collect data on turbidity and physical effects on growth and assess planting efficacy before implementing large-scale founder colonies. Areas of the study include Pirates Cove, Blue Lake, and Cow Bayou. Each site included exclosures with native plantings, unplanted exclosures for control and planted areas without protective exclosures. Native plant stock included eelgrass, coontail, American pondweed and spatterdock. Initial results point to herbivory, turbidity, surface energy, and substrate composition as factors contributing to planting success. This native vegetation study will continue through 2022, and add to fisheries biologists' understanding of where and how to focus native plant establishment efforts in the future.

Hydrologic Alterations on Mississippi River Batture Lands

In partnership with the Lower Mississippi River Conservation Committee and the National Fish and Wildlife Foundation, Inland Fisheries biologists are currently researching the impacts of floodplain habitat alteration on fish communities within the batture property of Richard K. Yancey WMA. Habitat alterations include the replacement of three culverts with larger culverts designed for fish-passage, the engineering and installation of a weir to provide low water refuge, and the refurbishment of a boat launch to provide access to the area. During FY 2021-2022, two culverts were replaced and the weir was installed as designed. Inland Fisheries biologists and researchers from LUMCON and Nicholls State University collected water quality, bathymetry data, fish community assemblage, and fish abundance data with the use of advanced SONAR technology, targeted gill netting, and boat electrofishing. Changes in fish community composition, bathymetry, water quality, and fish habitat will continue to be tracked through 2023 to assess how management of floodplain hydrology can impact fisheries productivity, aquatic habitat, and boating access.

Freshwater Mussel Inventory

Inland Fisheries biologists are currently surveying freshwater mussel communities in Western Louisiana in partnership with Texas A&M University and USFWS to update occurrence and density data for the Louisiana pigtoe (*Pleurobema riddellii*), which is undergoing a Species Status Assessment by the USFWS to determine if listing is required under the Endangered Species Act. This research is focused on historic sites, where the Louisiana pigtoe is known to occur, and sites not previously sampled. This research could lead to a known range expansions of this species throughout western Louisiana in the Calcasieu, Sabine and Red River drainages. Ongoing surveys of mussel communities within the Pearl River drainage system also allow LDWF to update inventory data and provide USFWS with current population estimates in that unique part of our state.

Advisory Group Membership

- Alligator Gar Committee of the Southern Division of the American Fisheries Society
- American Eel Subcommittee of the Warm Water Streams Committee of the Southern Division of the American Fisheries Society
- Atchafalaya Basin Program Technical Advisory Group (voting member)
- Bayou Vermillion Preservation Association
- Catfish Management Technical Committee of the Southern Division of the American Fisheries Society
- False River Watershed Council (chair)
- Gulf and South Atlantic Regional Panel of the Aquatic Nuisance Species Task Force
- Gulf Sturgeon Recovery Team
- Instream Flow Council
- Lake Providence Watershed Council (chair)
- Louisiana Fish Contaminants Advisory Group
- Louisiana Vegetation Managers Association (Board Member & Advisor)
- Louisiana Watershed Initiative Data and Modeling TAG
- Louisiana Watershed Initiative Nature Based Solutions Program advisory group

- Louisiana Watershed Initiative Projects TAG
- Lower Basin Pallid Sturgeon Workgroup
- Lower Mississippi River Conservation Committee - Executive Committee & Secretary/Treasurer
- Mid-South Aquatic Plant Management Society (Board Member)
- Mississippi Interstate Cooperative Resource Association - Paddlefish and Sturgeon Committee
- Mississippi Interstate Cooperative Resource Association - state representative
- Mississippi River Basin Panel on Aquatic Nuisance Species
- Pallid Sturgeon Recovery Team
- Pollution Committee of the Southern Division of the American Fisheries Society
- Reservoir Committee of the Southern Division of the American Fisheries Society
- Southeast Aquatic Resources Partnership
- Southeast Association of Fish & Wildlife Agencies - state representative
- Toledo Bend Power Project Relicensing Project (FERC/SRA) - Aquatic Resources Working Group
- Warm Water Streams Committee of the Southern Division of the American Fisheries Society

Presentations and Posters

Bates, M., S. Kinney, M. La Peyre. Benthic Tray Sampling and Electrofishing Capture Different Changes in Nekton Assemblages as Restored Reef Complexity Changes. Gulf Estuarine Research Society Conference, Ocean Springs, MS. Poster. October 2022

Duplessis, M., J. Winslow, G. Vitrano. Status survey for the Frecklebelly Madtom (*Noturus munitus*) in the Pearl River Drainage of Louisiana. Louisiana Chapter AFS, Thibodaux, LA. Poster presentation. May 2022.

Kinney, S. Considering Microplastics in Fisheries Management. Texas Chapter of AFS Annual Meeting, Hunt, TX. Oral Presentation. May 2022.

Maxwell, R. Tracking and Estimating Inland Fish Kills in Louisiana Following Hurricane Ida. Southern Division of the American Fisheries Society Annual Meeting. Oral presentation. January 21, 2022.

Quinn, J., K. Winningham, M. Hartman, E. Brinkman, T. Slack, R. Maxwell, S. Kinney, B. Salyers, and K. Kimmel. Outmigration dynamics of American Eels in the Ouachita-Black-Red-Atchafalaya River System. Southeastern Fishes Council Meeting. Oral presentation. November 18, 2021.

Walker, C., R. Maxwell, R. Bourgeois, Dance, M. Tracking Large-scale Movement of Invasive Carp in Louisiana. Gulf and South Atlantic States Regional Panel on Aquatic Invasive Species, Fall 2022 Meeting, New Orleans, LA. Oral presentation. Nov. 2022.

Walker, C., R. Maxwell, R. Bourgeois, M. Dance. Movement Patterns of Invasive Carp in Coastal Louisiana. National AFS Conference, Spokane, WA. Oral presentation. Sept. 2022.

Walker, C., R. Maxwell, R. Bourgeois, M. Dance. Silver Carp Movement in Southern Louisiana. Louisiana AFS Conference, Thibodaux, LA. Poster. 1st Place: Best Student Poster. May 2022.

FISHING ACCESS AND OPPORTUNITY

Louisiana is nationally recognized by anglers and fisheries professionals as a premier sport fishing destination. The Office of Fisheries strives to create, enhance and restore our state's inventory of public boating and fishing access sites. Access sites, including marinas, boat launches and fishing piers, serve as doorways to our state's natural resources.

ACCESS

In a cooperative effort, LDWF provides financial assistance to local government entities through a competitive process to construct, improve and repair boating and fishing access facilities. Improvements and repairs are also made to boating and fishing access facilities owned by LDWF. This program is funded through the Sport Fish Restoration Program and includes both freshwater and saltwater projects. Projects may include the construction of boat ramps, parking areas, docks, bulk heading and fishing piers.

BOATING ACCESS PROJECTS COMPLETED

- **Bussey Brake Reservoir:** Bussey Brake Reservoir is owned and maintained by LDWF. The renovation project, initiated in 2013, was completed by the Inland Fisheries Division in 2020, and has resulted in many upgrades to this historically popular recreational area in Morehouse Parish. Bussey Brake WMA has seen nearly 10,000 visitors since it was re-opened to the public; and in May 2022, Inland Fisheries received a national award from the American Fisheries Society for Bussey Brake WMA as the most Outstanding Sport Fish Restoration Project in the country focused on fishery development and management.
- **Town of Madisonville Boat Launch Renovations:** Project included repairs/replacement of the existing mooring docks.
- **Lake Martin Boat Ramp Renovations:** Project includes the renovation of the mooring dock and surrounding parking area at the Lake Martin Boat Ramp in St. Martin Parish.
- **City of New Iberia Boat Slips:** Project includes the construction of mooring facilities along Bayou Teche in downtown New Iberia to accommodate transient boaters.

BOATING ACCESS FACILITIES PLANNED OR UNDER CONSTRUCTION

- **Deer Park Boat Launch:** The Deer Park boat launch is owned and maintained by LDWF. Repairs include replacing sections of the concrete boat ramp, installing sheet piling and back fill to prevent future erosion and drainage improvements to the parking area.
- **City of New Iberia Civic Center Marina Phase I:** Project includes the construction of mooring docks and related amenities along Bayou Teche in downtown New Iberia adjacent to the Civic Center facility.
- **Town of Leonville Boat Launch Improvements:** Project includes the construction of a pavilion and bathroom facilities at the existing boat launch.
- **City of New Iberia Civic Center Marina Phase II:** Project includes the construction of mooring docks and related amenities for transient boaters along Bayou Teche in downtown New Iberia adjacent to the Civic Center facility.
- **Bucktown Harbor Marina and Dock Renovation:** Project includes the construction of mooring docks and

related amenities for transient boaters in Bucktown Harbor Marina in Jefferson Parish.

FISHING ACCESS FACILITIES COMPLETED

- **St. Tammany Fishing Pier Phase II:** Project included constructing amenities and additional wooden crossovers to connect the existing Phase I Twin Span fishing pier.

FISHING ACCESS FACILITIES PLANNED OR UNDER CONSTRUCTION

- **West Monroe Riverfront Park Fishing Pier:** This project includes the installation of a walk-way and fishing pier on the Ouachita River in downtown West Monroe.

CLEAN VESSEL ACT PROGRAM

- **City of New Iberia CVA Sanitation Facility:** Project includes relocation of an existing pump out facility to the future site of a mooring facility in downtown New Iberia.
- **Bucktown Harbor Marina Pumpout Facility:** Project includes the installation of a pumpout system at the marina facility in Jefferson Parish.

NUISANCE AQUATIC VEGETATION

Control of nuisance aquatic plant species is necessary to provide access to many public waterways. Aquatic vegetation management efforts are designed to ensure that the natural environment and human interests are mutually protected.

Our natural resources are constantly under attack from invasive species posing a threat to healthy habitats and access opportunities for the public. The flagship of these initiatives is our Aquatic Plant Control Program, which strives to provide the public with safe and usable fishing and boating access. Left unchecked, invasive plants have the potential to completely inundate the state's abundant freshwater lakes, making them inaccessible and threatening the natural habitat of our valuable aquatic resources. Aggressive treatment of affected waters continued in FY 2021-2022 in an ongoing effort to restore and improve the aquatic habitat and the natural balance of plants and fish.

The Aquatic Vegetation Management Plan format was created for lakes that do not have an approved LDWF Waterbody Management Plan to provide a lake description, basic information, a listing of lake authorities, historical vegetation control information, current aquatic plant status, and recommendations for control. These documents are used as a guide for aquatic plant control and as a source of recommendations and information to provide to the lake authorities and the public. In FY 2021-2022, the Aquatic Plant Control Program completed 60 Vegetation Management Plans for Louisiana public waterbodies.

In FY 2021-2022, herbicides were applied to 27,093 acres of nuisance aquatic vegetation, and the majority of these efforts included control of 8,595 acres of water hyacinth, 14,157 acres of giant salvinia, 974 acres of alligatorweed and 766 acres of common salvinia.

Another method used for control of aquatic vegetation includes water level fluctuations. Natural water systems benefit from high springtime water levels and lower water levels in the fall. Benefits include aquatic vegetation control and a healthier fish population. For impounded waters, partial dewaterings (typically called drawdowns) are often conducted to induce similar benefits. These drawdowns also provide the opportunity for improvements to shoreline properties. Drawdowns were successfully conducted on 12 inland reservoirs in FY 2021-2022 (*Table 13*).

In recent years, aquatic plant control biologists have shifted efforts towards identifying and utilizing all effective plant control methods available. Integrated pest management involves combining the effects of chemical, mechanical and biological control methods to manage nuisance species more effectively and efficiently. The long-term benefits and cost efficiency provided by the integrated pest management strategy allows LDWF to more effectively manage the aquatic vegetation infestations throughout Louisiana's public waterbodies.

Evaluation of Giant Salvinia Control Methods

Since 2006, giant salvinia has spread to waters throughout much of Louisiana. As a result, identifying and implementing all efficient and effective control methods for this invasive aquatic weed has been a priority for the Aquatic Plant Control Program. Introduction and establishment of giant salvinia weevils, a species-specific biological control, has been a major focus of the program since that time. Most recently, salvinia weevil research has focused on finding or selecting for a cold tolerant weevil ecotype in order to ensure overwintering in the northern part of the state. In recent years, LDWF has evaluated the effectiveness of several mechanical control devices including the WaterMower, bucket boats, mashers, harvesters and weed cutters. Unfortunately, mechanical control options are typically slower, more labor intensive and more expensive than LDWF's current giant salvinia control approach which includes herbicide applications, water level manipulation and weevil establishment. Although herbicide applications remain a major part of the salvinia control efforts, the Aquatic Plant Control Program continues to search for more effective and cost efficient chemicals available for use in aquatic systems. Since 2012, LDWF has worked closely with USACE and LSU AgCenter weed scientists to explore the effectiveness of new herbicides, and to test the potential of mixtures of herbicides and the effects of different surfactants. This research includes controlled, replicated experiments, as well as field evaluations of mixtures that show potential for more cost-efficient

TABLE 13. *Drawdowns conducted in FY 2021-2022.*

LAKE NAME	DRAWDOWN DATES	PURPOSE OF DRAWDOWN
Bistineau Lake	July 19, 2021 - Feb. 4, 2022	Giant salvinia control and bottom oxidation
Cheniere Lake	2016	Repairs to spillway
Iatt Lake	July 19 - Oct. 19, 2021	Vegetation control, bottom oxidation
Indian Creek Lake	Sept. 13 - Jan. 10, 2022	Vegetation control, bottom oxidation
Anacoco Lake	Jan 15, 2021 - Jan 15, 2022	Lake renovation for ageing reservoir
Lake Cocodrie	Jan. 4 - Sept. 30, 2021	Vegetation control; bottom oxidation
False River	Sept. 8, 2021 - Jan. 15, 2022	Bottom oxidation/sediment consolidation
Henderson Lake	Aug. 2 - Nov. 1, 2021	Vegetation control; bottom oxidation
Saline Lake	June 1 - Oct. 1, 2021	Vegetation control; bottom oxidation
Clear-Smithport	July 1 - Dec. 1, 2021	Vegetation control; bottom oxidation
Black-Clear Lake	Aug. 2, 2021 - Jan. 31, 2022	Vegetation control; bottom oxidation
Kincaid Lake	July 5 - Dec. 28, 2021	Vegetation control; bottom oxidation

TABLE 14. Get Out & Fish! Stocking Schedule: Number of Fish in Pounds

SITE NAME	OCTOBER: CATFISH	DECEMBER: CATFISH	JANUARY: RAINBOW TROUT	MARCH: CATFISH	JUNE: CATFISH
Girard Park	400	200	200	100	200
Southside Regional Park	400	200	200	400	400
Zemurray Park	300	200	300	300	300
BREC	800	400	400	800	800
William T. Polk	400	200	200	400	400
Kiroli Park	500	250	400	500	500
Grambling	400	200	200	400	400
Purple Heart Memorial Park	600	300	300	600	600
Turner's Pond	1,000	500	500	1,000	1,000
Sidney Hutchinson	400	200	200	400	400
Elmore D. Mayfield Park	1,000	500	500	1,000	1,000
Bayou Country Sports Complex	1,000	500	400	1,000	1,000
Forts Randolph/ Buholow	1,000	500	500	1,000	500
Joe Brown Park	1,000	500	500	1,000	1,000
I-10 Park	1,000	500	500	1,000	1,000
Bogue Chitto State Park	800	400	500	800	800
Parc Natchitoches	600	300	300	600	600
Total Pounds Per Month	11,600	5,850	6,100	11,300	10,900

Fish caught at Joe Brown Park at a pond stocked by the Get Out & Fish! Program.

control. It has been proven that either of the herbicides Clipper (flumioxazin) or Stingray (carfentrazone) can be used as an alternative to diquat dibromide to act as an indicator and to initiate plant damage when combined with glyphosate for salvinia control. Experiments continued throughout FY 2021-2022, focusing on the effectiveness of alternative herbicides both alone and in combination. Metsulfuron methyl was recently tested for activity on giant salvinia. This herbicide is new to aquatics and was found to have very positive results in a mesocosm study conducted by the LSU AgCenter. LDWF was recently granted an experimental use permit for this herbicide, which has facilitated large-scale field-testing. After two, less than desirable results from field studies LDWF plans to repeat field-testing on MSM to validate those results. These efforts will continue as new herbicides become available and could lead to more effective control of giant salvinia in the future.

Presentations

Hill, D. Louisiana: A History of *Salvinia molesta* Management Aquatic Plant Management Society, July 12-14, 2021. New Orleans, LA.

Hill, D. Louisiana: A History of *Salvinia molesta* Management Louisiana Aquatic Vegetation Management Association, Oct. 5-6, 2021. Pineville, LA.

Hill, D. Aquatic Pest Control: Calibration Review. Louisiana Aquatic Vegetation Management Association, Jan. 24-25, 2022. Baton Rouge, LA.

Hill, D. Louisiana: A History of *Pontederia crassipes* Management Invasive Alien Species in Wetlands of the Mekong River Basin: Impacts and Management, Dec. 6-7, 2021. Lafayette, LA.

FISHING OPPORTUNITY

Louisiana's fishery resources, including habitat, benefit all of Louisiana's constituent groups within the state and across the Gulf Coast. Habitat stewardship and resource management provide opportunities for the public to access these natural resources.

COMMUNITY FISHING PROGRAM

The "Get Out & Fish!" community fishing program was initiated in November 2014. The goal of the program is to work with local community organizations and governments to provide easily accessible, high-quality fishing opportunities to everyone in Louisiana. The program intends to recruit new anglers to the sport of fishing and promote outdoor activities for future generations. In order to accomplish this mission, public water bodies that met the required specifications were chosen by LDWF biologists to begin stocking fish on a regular basis.

Get Out and Fish! Sites

There are currently 17 community fishing sites throughout the state of Louisiana. With continuing COVID-19 concerns during FY 2021-2022, large launch events were delayed another year. However, all 17 sites were stocked with both channel catfish (in the spring and fall) and rainbow trout (in the winter) to total 39,650 pounds of channel catfish and 6,100 pounds of rainbow trout (*Table 14*).

A Holiday Tagging Derby was held across the state from Dec. 18-25. A total of 170 catfish were tagged and released (10 tagged fish per site) with nine fish reported as recaptured. The sites with reported recaptures were Parc Natchitoches (3), BREC's Burbank, Zemurray Park, Bayou Country Sports Complex, Girard Park, Elmore D. Mayfield and Sidney Hutchinson. Anglers were able to report the tagged Catfish using an online form or by calling into the Tag Hotline phone number. Both the phone number and website were printed on the tags. Anglers received an LDWF prize package for reporting a tagged fish during the derby.

ARTIFICIAL REEFS

The Louisiana Artificial Reef Program was created by Act 100 of the 1986 Louisiana Legislature within LDWF. Act 100 also required the formation of the Artificial Reef Development Council, development of an Artificial Reef Plan, and establishment of the Artificial Reef Trust Fund.

The Artificial Reef Development Council is comprised of the Secretary of LDWF, the Dean of LSU's School of the Coast and the Environment, and the Executive Director of Louisiana Sea Grant, or their designees. The council is charged with providing guidance on policy, procedural matters, site selection and allocation of funds to the program. The Office of Fisheries administers and manages the program in accordance with the National Artificial Reef Plan, Louisiana Artificial Reef Development Plan, pertinent regulations, laws and budget allocation.

The Louisiana Artificial Reef Plan was developed and implemented in November 1987. The plan outlines the siting, permitting and monitoring requirements. The plan centers on nine artificial reef planning areas and the conversion of oil and gas platforms into permanent marine hard-bottom habitat. The program also includes special artificial reef sites, deepwater reefs, nearshore reefs and inshore reefs. The program works closely with stakeholders, public and private conservation groups, and appropriate regulatory agencies when developing, maintaining and monitoring Louisiana's artificial reefs.

In FY 2021-2022, the program enhanced six offshore reefs with fourteen oil and gas platforms and received $6.2 million in donations from oil company participation. It also completed one new deepwater reef, Ship Shoal 358. The program also created four new nearshore reefs (Eugene Island 51, West Cameron 45, Vermilion 69, and South Timbalier 51), while enhancing one existing one (Bay Marchand 3).

In FY 2021-2022, through funds provided by the Louisiana Restoration Area Trustee Implementation Group, LDWF continued the monitoring of all completed inshore and nearshore artificial reef enhancement sites. This is part of a five-year plan to assess the success of artificial reefs enhanced in an effort to mitigate for recreational use opportunities lost during the 2010 *Deepwater Horizon* oil spill. Monitoring efforts include the study of the aquatic organisms utilizing the reef enhancement sites via the use of gillnetting, rod and reel sampling, and benthic tray observations, as well as observations of recreational users. Together, those efforts are intended to provide insight into the overall biological health of the reef enhancement sites as well as insight into whether those sites are providing enhanced recreational opportunities to the public.

The locations of all of Louisiana's artificial reefs can be found on the LDWF website, including an Interactive GIS-based map (*ldwf.maps.arcgis.com/apps/MapSeries/index.html?appid=4c4a4d9526c248c080c3eaa4808b9bea*).

Important Figures for FY 2021-2022

- 81 total established offshore artificial reef sites
  - 48 planning area reefs
  - 19 special artificial reef sites
  - 14 deepwater reefs
- Offshore structures converted to permanent habitat
  - 426 platform jackets
  - 8 drill rig legs
  - 3 oil and gas structures deployed
- 19 established nearshore reefs
- 33 inshore reefs sites

FRESHWATER ARTIFICIAL REEF PROGRAM

Freshwater artificial reefs are used to accomplish multiple Inland Fisheries objectives, but the primary objective for this program is to increase angler success. For many anglers, finding fish in a waterbody, especially one that is new to them, is a major obstacle to a successful fishing trip. Artificial reefs concentrate fish, and identifying the structures on maps and with buoys makes them available to all anglers. A secondary objective is increased fisheries habitat. As lakes age, flooded timber decomposes and water bottoms may accumulate silt and organic debris. This progression can lead to a reduction in fisheries productivity. If sufficient artificial cover or substrate is added, fisheries productivity can be maintained.

LDWF facilitates this program by partnering with sponsor groups to construct artificial reef projects. LDWF's role in this program is that of an administrator and/or consultant. As such, the department makes final decisions relative to project design, material selection, and placement for all approved projects. The U.S. Coast Guard is consulted if artificial structures are proposed to be placed in navigable waterways. LDWF's Inland Fisheries biologist managers serve as points of contact for proposed projects and must grant prior approval for proposed projects to ensure compliance with project guidelines.

Important Figures for FY 2021-2022

- LDWF deployed 13 new artificial reef structures in three waterbodies (Kincaid, Vernon Lake, Grand Bayou Reservoir).
- Total freshwater reefs = 143 statewide; all can be found on the interactive map on LDWF website.

FRESHWATER FISH HATCHERY PROGRAM

The Louisiana Hatchery Program partners with local, state and federal agencies to produce or purchase freshwater fish to start or enhance statewide sport fisheries, to hasten the recovery of fisheries affected by natural or man-made disasters, and to produce threatened or endangered species, if necessary. Fish are requested annually by Inland Fisheries staff, according to the department's Resource Enhancement through Stocking guidelines. The program also provides support services for LDWF's outreach, education and aquatic plant control programs.

FISH STOCKING

In FY 2021-2022, LDWF biologists released approximately 12.9 million fish into public Louisiana waterbodies. The released fish were comprised of 11 species and included various surplus hatchery fish as well as fish purchased by other state/local organizations through cooperative agreements. Ranging in size from fry to adults, the fish were planted into 67 public waterbodies for the purposes of rough fish control, sportfish enhancement, aquatic plant control, or to provide improved fishing opportunities. *Table 15* details fish stockings by the LDWF hatchery program and partners over the 2021-2022 reporting year.

HAZARD ANALYSIS CRITICAL CONTROL POINT PLANNING

Nuisance aquatic species are harmful and expensive to control. The best way to avoid or reduce problems involving these species is prevention. In FY 2021-2022, hatchery bi-

ologists continued their work to implement Hazard Analysis Critical Control Point plans. Hazard Analysis Critical Control Point plans identify, assess, and minimize risks of spreading nuisance aquatic species from Booker Fowler Fish Hatchery to stocking sites across the state and vice versa. The plans mitigate the risks of spreading nuisance aquatic species in Louisiana waters.

Nuisance invasive aquatic species occurrence maps and at-risk basins were updated based on actual nuisance aquatic species sightings by state Fisheries biologists. Hatchery staff reference these tables prior to using hatchery equipment at any particular stocking site so they understand the known and potential risks at each site and what particular disinfection efforts are required for each site.

HATCHERY AND FISHERIES OUTREACH/EDUCATION

Hatcheries kicked off the 2022 spawning season with an educational paddlefish spawning event in support of LDWF's Fisheries Outreach Native Fish in the Classroom Program. Students and teachers participating in the Native Fish in the Classroom Program attended the event to learn about spawning techniques used to produce paddlefish, invasive aquatic species, age and growth of fish, and largemouth bass production. They had an opportunity to participate in the spawning event and then they took fertilized paddlefish eggs back to their classrooms to hatch and grow.

INVESTIGATIONAL NEW ANIMAL DRUG PROGRAM PARTICIPATION

LDWF hatcheries continued to participate in the USFWS National Investigational New Animal Drug Program. This program provides a safe and legal way for fish culturists to procure and use experimental drugs and allows LDWF to contribute safety and efficacy data to the USFWS for helping with the approval process. This year, the hatchery participated by using LHRHa, a synthetic hormone that causes spermiation and ovulation, for spawning paddlefish.

ADVISORY GROUP MEMBERSHIP

- Southern Division of the American Fisheries Society Aquaculture Technical Committee

PROFESSIONAL ORGANIZATION MEMBERSHIPS

- Louisiana Chapter of the American Fisheries Society
- Southern Division of the American Fisheries Society
- American Fisheries Society
- Fish Culture Section of the American Fisheries Society
- U.S. Aquaculture Association
- World Aquaculture Association

TABLE 15. FISH STOCKING BY WATERBODY (7/1/2021 - 6/30/2022)

BODY OF WATER	SPECIES	SIZE	NUMBER STOCKED
Amite River	Northern Largemouth Bass	Fry	82,800
Anacoco Lake	Bluegill	Fingerlings	556,810
	Channel Catfish	Fingerlings	130,000
	Florida Largemouth Bass	Fingerlings	51,900
	Redear Sunfish	Fingerlings	320,800
Bayou Bienvenue	Florida Largemouth Bass	Phase II Fingerlings	3,670
Bayou Huffpower	Channel Catfish	Fingerlings	400
Bayou D'Arbonne Lake	Florida Largemouth Bass	Fingerlings	283,900
Black Lake & Clear Lake	Florida Largemouth Bass	Fingerlings	119,980
Black River Lake	Florida Largemouth Bass	Fry	250,200
		Fingerlings	50,000
Blind River	Northern Largemouth Bass	Fry	86,400
BREC Pond - Forest Park	Channel Catfish	1-Year-Old	150
BREC Pond - Howell Park	Channel Catfish	1-Year-Old	500
BREC Pond - Perkins	Channel Catfish	1-Year-Old	150
BREC Pond - Sherwood	Channel Catfish	1-Year-Old	500
BREC Pond - Zachary	Channel Catfish	1-Year-Old	250
Bundicks Lake	Bluegill	Fingerlings	97,150
	Channel Catfish	Fingerlings	87,500
	Redear Sunfish	Fingerlings	100,500
Bussey Brake	Black Crappie	Fingerlings	58,200
	Florida Largemouth Bass	Fry	319,800
	Golden Shiner	Adults	13,440
	White Crappie	Fingerlings	33,150
Caddo Lake & James Bayou	Florida Largemouth Bass	Fry	2,030,400
Calcasieu River	Florida Largemouth Bass	Fry	51,600
	Northern Largemouth Bass	Fry	10,200
Caney Creek Reservoir	Florida Largemouth Bass	Fingerlings	4,000
Chicot Lake	Channel Catfish	Fingerlings	16,400
	Florida Largemouth Bass	Fingerlings	32,600
Corney Lake	Florida Largemouth Bass	Fingerlings	14,000
Crooked Creek Lake	Channel Catfish	Fingerlings	2,000
Cross Lake	Florida Largemouth Bass	Fingerlings	98,900
Drainage Canals: Jefferson & Orleans Parish	Bluegill	Fingerlings	4,250
	Florida Largemouth Bass	Adults	100

TABLE 15 (cont). FISH STOCKING BY WATERBODY (7/1/2021 - 6/30/2022)

BODY OF WATER	SPECIES	SIZE	NUMBER STOCKED
False River	Black Crappie	Fingerlings	10,970
Fullerton Lake	Bluegill	Fingerlings	5,900
	Channel Catfish	1-Year-Old	1,020
Henderson Lake	Channel Catfish	Fingerlings	7,570
Holbrook Park Pond	Bluegill	Fingerlings	2,100
	Channel Catfish	1-Year-Old	400
	Redear Sunfish	Fingerlings	2,000
Horseshoe Lake Caldwell	Channel Catfish	Fingerlings	2,280
Jackson VA Home	Channel Catfish	1-Year-Old	100
Kepler Creek	Threadfin Shad	Fingerlings	10,100
Kincaid Lake	Channel Catfish	Fingerlings	22,600
	Florida Largemouth Bass	Fingerlings	38,000
Lafreineire Park	Channel Catfish	Fingerlings	3,600
Lake Bistineau	Florida Largemouth Bass	Fingerlings	19,500
Lake Bruin	Florida Largemouth Bass	Fingerlings	47,400
Lake Buhlow	Channel Catfish	Fingerlings	5,600
	Florida Largemouth Bass	Phase II Fingerlings	27
Lake Claiborne	Florida Largemouth Bass	Fingerlings	80,000
	F_1 Hybrid Largemouth Bass (Florida x Northern Largemouth Bass)	Fingerlings	80,000
Lake Concordia	Florida Largemouth Bass	Fry	250,800
		Fingerlings	50,000
Lake Fausse Point & Dauterive Lake	Florida Largemouth Bass	Fry	365,400
Lake St. John	Florida Largemouth Bass	Fry	273,600
		Fingerlings	50,000
Lamar Dixon 11-acre Pond	Channel Catfish	1-Year-Old	1,300
Lamar Dixon 4-acre Pond	Channel Catfish	1-Year-Old	500
Little Piney Park Pond	Bluegill	Fingerlings	300
	Channel Catfish	1-Year-Old	50
	Redear Sunfish	Fingerlings	250
Mermentau River	Florida Largemouth Bass	Fry	677,400
Mill Creek Lake	Threadfin Shad	Fingerlings	21,600
Old River at Bivens Beauregard Parish	Black Crappie	Fingerlings	7,000
	Bluegill	Fingerlings	25,000
	Redear Sunfish	Fingerlings	25,000
Poverty Point Reservoir	Florida Largemouth Bass	Fingerlings	22,100
Purple Heart Memorial Park	Bluegill	Fingerlings	600
	Redear Sunfish	Fingerlings	500
Red River (Dam 2 to Dam 1)	F_1 Hybrid Largemouth Bass (Florida x Northern Largemouth Bass)	Phase II Fingerlings	1,800
	Florida Largemouth Bass	Phase II Fingerlings	7,200
Red River (Dam 3 to Dam 2)	F_1 Hybrid Largemouth Bass (Florida x Northern Largemouth Bass)	Phase II Fingerlings	1,800
	Florida Largemouth Bass	Phase II Fingerlings	7,200
Red River (Dam 4 to Dam 3)	F_1 Hybrid Largemouth Bass (Florida x Northern Largemouth Bass)	Phase II Fingerlings	3,600
	Florida Largemouth Bass	Phase II Fingerlings	14,500
Red River (Dam 5 to Dam 4)	F_1 Hybrid Largemouth Bass (Florida x Northern Largemouth Bass)	Phase II Fingerlings	4,500
	Florida Largemouth Bass	Phase II Fingerlings	18,000
Red River (Shreveport to Dam 5)	F_1 Hybrid Largemouth Bass (Florida x Northern Largemouth Bass)	Phase II Fingerlings	6,400
	Florida Largemouth Bass	Phase II Fingerlings	25,300
Rockefeller Wildlife Refuge	Florida Largemouth Bass	Fingerlings	54,400
Saline Lake	Florida Largemouth Bass	Fry	309,600
Sherburne WMA Pond	Bluegill	Fingerlings	1,600
	Channel Catfish	Fingerlings	600
	Redear Sunfish	Fingerlings	600
Spanish Lake	Florida Largemouth Bass	Phase II Fingerlings	300
Spring Bayou	Florida Largemouth Bass	Fingerlings	54,300
State Police Youth Camp	Channel Catfish	1-Year-Old	250
Taylor Lake	Florida Largemouth Bass	Fry	10,500
Thistlethwaite WMA Pond	Channel Catfish	Fingerlings	600
Tickfaw River	Northern Largemouth Bass	Fry	85,800
Toledo Bend Reservoir	Florida Largemouth Bass	Fry	4,740,000
		Fingerlings	50,000
		Fingerlings	400,150
Valentine Lake	Florida Largemouth Bass	Fingerlings	1,000
Vernon Lake	Channel Catfish	Fingerlings	7,470
	Florida Largemouth Bass	Fingerlings	84,100
	Threadfin Shad	Fingerlings	20,000
Waddill Ponds	Channel Catfish	1-Year-Old	250
West Feliciana Parish Sports Park	Channel Catfish	Fingerlings	250
TOTAL			***12,934,937***

FISHERIES OUTREACH AND EDUCATION PROJECTS

OUTREACH

The Aquatic Outreach and Education Program is designed to inform the public about programs and projects currently underway in the Office of Fisheries. Through outreach efforts including boat shows, school programs, community events and outdoor-related festivals, staff reached approximately 10,000 Louisiana citizens in FY 2021-2022.

During the year, LDWF staff and volunteer instructors made approximately 130 public appearances at community events, clinics, and other outdoor-related events. At each of these events, LDWF staff were able to inform Louisiana citizens of the importance of the Sport Fish Restoration Program and LDWF's role in the program's associated projects.

This year, LDWF staff hosted 12 Volunteer Instructor Program workshops throughout the state and trained approximately 350 volunteers. Those volunteers completed a training course, where they learned how to train others on fishing techniques, fish identification, fish biology, age and growth, and other fishing related topics. The course certified them as an official LDWF Aquatic Education volunteer. These volunteers are given a training manual with access to brochures, informational sheets, lesson plans on each fishing activity, and have access to borrow materials they need through LDWF's loaner kit program. They can volunteer to teach these activities at events that LDWF host or participates in across the state. Five of the 12 Aquatic Volunteer Instructor workshops were a shortened version for Louisiana's State Library System. Through the libraries' Summer Reading Program Workshops, LDWF was able to train approximately 200 librarians on several fisheries related topics in order to offer fisheries programs at their library. In the last year, LDWF VIP's throughout the state spent over 3,000 hours assisting with events throughout the state.

Our fisheries biologists also worked collaboratively with communications personnel to create promotional and educational material detailing research and fieldwork on a variety of topics relating to the conservation and management of fish, hatchery production, non-indigenous aquatic nuisance species and other aquatic resources.

During FY 2021-2022, staff utilized several educational resources including a casting inflatable, mobile touch tank and LDWF's mascot Robbie the Redfish.

AQUATIC EDUCATION

LDWF's Education Program introduces people to the sport of fishing and promotes awareness of Louisiana's aquatic resources. This is accomplished through fishing clinics, camps, teacher workshops and distribution of publications. Education Program staff and volunteers deliver aquatic education programs.

FISHING CLINICS

Classroom aquatic education plays a big role during the spring months of the school year reaching over 3,000 students each year, typically. Unfortunately, due to inclement weather and testing schedules, one of the largest aquatic clinics typically held in Sabine Parish in April was cancelled. However, two clinics that were held were the Terrebonne Aquatic Clinic reaching 990 students and the Grant Parish Clinic, reaching 153 students. In addition to the aquatic clinics, staff trained librarians statewide for the Summer Reading Program theme, Oceans of Possibilities, and made over 30 public appearances reaching over 1,000 visitors. Teachers and Librarians around the state have access to three aquatic education guidebooks: Finnie the Fingerling; Let's Go Fishing; Fishing for Fun. This year, 1,972 Let's Go Fishing, 660 Finnie the Fingerling and 726 Fishing for Fun guidebooks were distributed across the state. The guidebooks are used in the classroom or library and typically followed with a field or hands-on component.

Aquatic education guidebooks available for teachers to utilize in the classroom.

TEACHER WORKSHOPS

Teacher workshops were conducted to provide training in aquatic education that can be brought back to the classroom. The following workshops were conducted:

Native Fish in the Classroom

Native Fish in the Classroom is a multidisciplinary, classroom-based aquaculture stewardship project for middle to high school students. The goal of the Native Fish in the Classroom project is to develop a positive attitude of natural resource stewardship and to create a constructive, active learning situation in which students can explore strategies for sustaining aquatic ecosystems. Students obtain hands-on, science-based knowledge of the state's aquatic resources. Teachers attended several workshops and meetings to ensure successful preparation for receiving paddlefish eggs. In the spring semester, students attend the paddlefish spawn and are engaged in a meaningful field trip experience by actively assisting biologists with the egg fertilization process as well as learning about fisheries management through several other educational stations during the day. Students rear the paddlefish from eggs to fingerlings then release them to a LDWF pre-selected, pre-approved riverine habitat.

Due to the low water supply at the Booker Fowler Fish Hatchery, the paddlefish spawn was unable to occur this year. However, teachers and students were still given the opportunity to participate in the field trip to Booker Fowler Fish Hatchery focusing on fish dissection, paddlefish life history, age and growth of fish, invasive species and a tour of the facility.

Wetland Education Teacher Workshop (WETSHOP)

WETSHOP is a coastal awareness, teacher stewardship project held at the Grand Isle Fisheries Research Laboratory. The goals of WETSHOP are: 1) to provide teachers with a comprehensive look at wetland issues related to history, fisheries management, wetland habitats, wetland ecosystems, coastal land loss and restoration, water quality and oil and gas exploration. 2) to educate a large population of Louisiana's citizenry about the serious issues that Louisiana is facing due to coastal land loss. Throughout the week, participants are provided with a combination of field and in-class lessons to bring back to their classroom.

COMMERCIAL SEAFOOD PROGRAMS

One of the main objectives of the Office of Fisheries is to maintain the viability of Louisiana's fishing industries through programs that protect native resources and provide technical assistance to the industry, including recovery from natural and man-made disasters.

In addition, the Office of Fisheries is pursuing several initiatives for Louisiana's commercial fishing industry including a seafood certification program and a professionalization program that aims to create a more informed and efficient industry. Programs to collect and recycle used oyster shell and concrete to create artificial oyster and fishing reefs are also being developed in coordination with the Coalition to Restore Coastal Louisiana.

SKIMMER TURTLE EXCLUDER DEVICE REIMBURSEMENT PROGRAM

In November 2020, LDWF started the Skimmer Turtle Excluder Device Reimbursement Program. The goal of the Louisiana cost-share program is to provide financial relief to fishermen who need to purchase skimmer Turtle Excluder Devices as a result of the recently amended federal regulations and to reimburse 60% of the cost for the required gear. LDWF estimates this rule will effect 362 fishermen with residential skimmer licenses.

Participants in the program attended an online informational meeting, facilitated by LDWF and the NOAA Gear Monitoring Team. Topics of the meetings included specifications for the skimmer Turtle Excluder Devices, a review of the Turtle Excluder Device regulations, and details on the Skimmer Turtle Excluder Device Reimbursement Program. Two meetings were presented in Vietnamese by one of the NOAA Gear Monitoring Team members. LDWF hosted a total of 17 online meetings for this program.

Two hundred-twenty five participants attended at least one online meeting, and 179 fishermen finalized their reimbursement applications. LDWF sent an average reimbursement of 451.49 to the participating vessel owners, totaling $80,817. Funds for this project were awarded to LDWF through a National Fish and Wildlife Foundation grant.

SEAFOOD CERTIFICATION

In 2009, LDWF reprogrammed grant money from a NOAA grant to fund certification programs for Louisiana's seafood industry. The overarching plan for a broad certification program included five key components: seafood origin/quality certification; seafood sustainability certification; industry professionalization; electronic traceability; and seafood marketing.

The goal of the Louisiana Wild Seafood Certification Program is to increase demand for wild-caught Louisiana seafood. By creating an origin based brand, LDWF, in cooperation with the Louisiana Department of Health and the Louisiana Department of Agriculture and Forestry, has the ability to communicate to the consumers that the seafood they are consuming is caught by a licensed Louisiana fisherman, landed in Louisiana and processed by a Louisiana processor through the entire supply chain. The ability to create a national brand that can be sought out by chefs, consumers, distributors and retail chains will increase the demand and thereby prices for the Louisiana seafood fishery.

Several changes and developments to the program were implemented during FY 2013-2014 including the transition to an online application process as well as supply chain verification through invoice validation. Also introduced was a product registration requirement - retail packages possessing the program's logo must register with LDWF. In FY 2014-2015, the online renewal process was simplified, allowing participants to easily renew their permit instead of reapplying. Before applying, applicants must also participate in a 45-minute training video available through the program's website. Once permitted, participants are given access to a participant portal where they may access program logo files and verify participation of their supply chain in the Louisiana Wild Seafood Certification Program.

The program's first three years focused on building program interest among seafood dealers and processors within Louisiana. During FY 2014-2015, implementation was focused on the retailer and consumer aspects of the program, with an emphasis on creating demand for products bearing the Louisiana Wild Seafood Certification Program logo. The program has launched additional marketing campaigns including the use of social media. Within FYs 2015-2017 the focus was to build the interest of the program amongst the public to demand Louisiana seafood.

As of FY 2021-2022 there are a total of 20 permitted seafood businesses participating in the program and several "certified" labeled seafood retail packages are being sold in grocery markets across the state.

SUSTAINABLE FISHERIES AND SEAFOOD

The goal of the sustainability program is to manage Louisiana fisheries in a way that provides for today's needs without damaging the ability of the species to reproduce. Many seafood purveyors worldwide are under pressure to demonstrate the seafood they are sourcing is from sustainable and responsibly managed fisheries. LDWF is meeting these challenges with multiple approaches.

LDWF has explored mainstream sustainability certifications for major fisheries, such as those offered by the Marine Stewardship Council. In March 2012, Louisiana's blue crab fishery became the first blue crab fishery in the world to receive Marine Stewardship Council sustainability certification. This certification was scheduled to expire in March 2017, but it was extended to March 2018 as LDWF participated in a new pilot re-certification process. Re-certification to the Marine Stewardship Council standard was awarded in July 2018. The fourth surveillance audit is scheduled to take place during fall 2022.

In addition to Marine Stewardship Council certification, the Office of Fisheries has developed a Gulf-centric sustainability certification system in partnership with the Audubon Nature Institute. The Audubon Gulf United for Lasting Fisheries (GULF) Program is leading the development of this Responsible Fisheries Management certification program based on the United Nations Food and Agriculture Organization and International Standards Organization protocols. LDWF participates on the Audubon GULF Technical Advisory Committees, including a Fisheries Technical Advisory Committee, which previously functioned as the more general Technical Advisory Committee; and a new Chain-of-Custody Technical Advisory Committee that was established in May 2017. The Louisiana blue crab fishery attained certification to the Responsible Fisheries Management Program

in 2016. The fishery passed the fourth surveillance audit and reassessment in May 2021. The Audubon GULF - Responsible Fisheries Management Program itself was assessed by the Global Sustainable Seafood Initiative against Food and Agriculture Organization of the United Nations best international practices regarding certification systems. Recognition of the Audubon GULF - Responsible Fisheries Management certification program was awarded by the Global Sustainable Seafood Initiative in October 2018. Most recently, the Audubon GULF - Responsible Fisheries Management certification program passed its Global Sustainable Seafood Initiative Monitoring of Continued Alignment review in August 2020. The Global Sustainable Seafood Initiative should finalize their Global Benchmark Tool v2.0 in late 2021 and the Audubon GULF - Responsible Fisheries Management will need to apply for re-benchmarking to v2.0 by early 2022.

We are continually vetting our program with seafood buyers to ensure Louisiana seafood and the Audubon GULF Program will have market acceptance. LDWF has engaged national retail organizations and suppliers in intense dialogue concerning sustainable seafood market needs and desires. LDWF continues active conversations with private-sector actors about fishery improvement projects and marine advancement projects for those Louisiana fisheries that have not taken up formal certification. In January 2016, revised pre-assessments were conducted for the Louisiana shrimp fishery according to the Audubon GULF - Responsible Fisheries Management and the Marine Stewardship Council programs. Based on these pre-assessments, the Audubon Nature Institute is leading a joint comprehensive fishery improvement project encompassing issues identified in both pre-assessments. The Louisiana shrimp fishery improvement project recently underwent an audit so that it maintains the comprehensive status. A shrimp by-catch study in support of these fishery improvement projects was completed in July 2020. A final report characterizing bycatch within the Louisiana shrimp fishery is was completed in the fall of 2020. Currently the shrimp fishery improvement project is rated "A," the highest available rating and has a target end of December 2022. The shrimp industry is expected to pursue assessment for sustainability in the fall of 2022.

COMMERCIAL SEAFOOD INDUSTRY PROFESSIONALIZATION

The primary goal of Louisiana Fisheries Forward, the voluntary industry professionalization program, is to create a better-informed and more efficient commercial fishing industry that helps ensure the economic sustainability of the state's commercial fishing industry. The program provides ongoing educational opportunities for fishermen and industry participants while also allowing them to receive the most relevant and up-to-date information pertaining to their industry.

Louisiana Fisheries Forward - Advancing Our Seafood Industry is an LDWF Office of Fisheries collaborative effort with Louisiana Sea Grant and the LSU AgCenter. Louisiana Fisheries Forward is a professionalism program for all sectors of the state's commercial fishing industry, including fishermen, dock owners, processors and distributors. This program is providing the education and training essential for the continued success of the industry and is focusing on a number of important topics through videos with corresponding fact sheets, the Louisiana Fisheries Forward Summit, hands-on workshops, and the Louisiana Fisheries Forward website.

From July 2021 to June 2022, LDWF and Louisiana Sea Grant continued to execute the production of educational materials (referred to as fast fact sheets), maintain the Louisiana Fisheries Forward website (*lafisheriesforward.org*), and plan our biannual fisheries summit.

Examples of Fast Fact Sheet (available on *lafisheriesforward.org*):

- Best Practices for Freshwater Finfish
- Alternate Oyster Culture Permitting
- Preventing Shrimp Blackspot
- Selling Your Catch Direct to the Public

In addition to producing educational material during FY 2021-2022 legislatively mandated industry professionalism programs remained active for Commercial Crab Trap Gear Requirements (*www.wlf.la.gov/page/mandatory-crab-trap-license-training*) and the Oyster Harvester Training Requirements (*www.wlf.la.gov/page/mandatory-oyster-harvester-training*).

Legislation was passed during the 2014 regular session that required the Louisiana Wildlife and Fisheries Commission to establish a program to increase and elevate professionalism in the commercial crab industry. Throughout the fall of 2014, LDWF developed the Louisiana Fisheries Forward Commercial Crab Gear Requirement. The Commercial Crab Gear Requirement consists of basic training and field training requirements that focus on education such as proper fishing techniques necessary for the health and sustainability of crabs; proper techniques for the best capture and presentation of the crabs for marketability; and proper placement, tending and maintenance of crab traps to reduce potential conflicts with other user groups. Beginning Nov. 15, 2014, any person who wishes to obtain a commercial crab trap gear license must first complete this program unless the following exception applies (possessed a valid crab trap gear license any two of the license years, 2011, 2012, 2013 or 2014). During FY 2021-2022 there were approximately 105 participants who completed the requirements (*Table 16*).

LDWF's intention is to give our seafood industry access and training to the latest trends, requirements, and technology in their profession. The seafood industry should have as much opportunity for training as any other industry in our state - we believe it will yield higher quality products and give our seafood community a competitive advantage in the

***TABLE 16.** Louisiana Fisheries Forward Commercial Crab Gear Requirement.*

PROGRAM STATUS	APPRENTICESHIP	SPONSORSHIP	GRAND TOTAL
Applicant Ineligible	67	204	**271**
Approved	16	105	**121**
Incomplete	4	5	**9**
M S Ineligible	44	108	**152**
In Review	2	2	**4**
Opt Out	6	16	**22**
Program Completed	175	543	**718**
Grand Total	***314***	***983***	***1297***

marketplace. Since the launch of Louisiana Fisheries Forward - Advancing Our Seafood Industry, this one-of-a-kind professionalism program for Louisiana's commercial fishing industry has received inquiry, acknowledgement and recognition throughout many facets of local, regional, and national fishing industries.

TASK FORCES

The Office of Fisheries has four active task forces: Shrimp, Oyster, Crab and Finfish. The task forces memberships are currently housed under LDWF, and cooperation between the task forces and the Office of Fisheries is essential as we move forward with the continued management of Louisiana's natural resources.

SHRIMP TASK FORCE

During FY 2021-2022, the Shrimp Task Force met on Aug. 4, 2021, Oct. 20, 2021, Dec. 8, 2021, Feb. 16, 2022, April 20, 2022 and May 4, 2022.

Agenda items discussed include:

- Fall inshore shrimp season.
- Shrimp Day on the Bay sampling.
- Senate Resolution 105, Which Provides Relative to Taking Shrimp in Lake Pontchartrain.
- Participated in the 2022 Louisiana Alive event.
- Davis Pond Diversion.
- TEDs regulations.
- Fisheries Disaster Spending Plan.
- Offshore Wind Development in the Gulf.
- Shrimp sustainability programs.
- External review of LA management in support of sustainability certification.
- 2019 Fisheries Disaster Funding and spending plan.
- GULF - Responsible Fisheries Management Sustainability Certification.
- USDA COVID-19 Grants.
- ASPA update on shrimp industry efforts.
- Damage assessment of seafood industry after Hurricane Ida and related assistance.
- Freshwater disaster funding.
- Traversing and off loading license.
- Presentation on commercial landings of shrimp and blue crabs from Lake Pontchartrain: 2015-2020.
- New speckled trout regulations.
- Update on TEDs and the status of the AG's Office.
- Discuss the STF trip to Washington, D.C.
- Status update and discuss litigation strategy in the matter of State of Louisiana, by and through Louisiana Department of Wildlife and Fisheries versus Gina Raimondo, in her official capacity as United States Secretary of Commerce, et al., C.A. No. 21-1523, Section "R" (2), U.S.D.C., Eastern District of Louisiana.
- Proposal to hire a lobbyist to represent the Shrimp Task Force.
- USDA's COVID-19 Seafood Processors Grant Program.
- Distribution of 2019 Flood Disaster and CARES Act funding.
- Federal Shrimp cELB vs. VMS Side-By-Side Comparison.
- Shrimp Ride Along Program and protocol.
- Presentation on trends in commercial white and brown shrimp landings by size category: 2010-2020.
- Update on the schedule and mitigation plan for the proposed Mid-Barataria Sediment Diversion.
- 3-mile closure in parts of Zone 2.
- Presentation on the LA search for National Estuarine Research Reserve.
- Update on funding for Gulf hypoxia.
- Update on recently proposed flounder regulations.
- Presentation on recent shrimp fishery trends.
- Presentation on imports of frozen shell on shrimp by size category.
- Possibility of an early opening of white shrimp season on the inside.
- Shrimp Sunset Review.
- TEDs and debris in Grand Isle.
- Officer elections.
- Presentation on setting the opening date for the 2022 Spring Inshore Shrimp Season.

CRAB TASK FORCE

During FY 2021-2022, the Crab Task Force met on Dec. 8, 2021, Feb. 15, 2022 and April 26, 2022.

Agenda items discussed include:

- Senate Resolution 105, Which Provides Relative to Taking Shrimp in Lake Pontchartrain.
- Derelict Crab Trap Rodeo Pilot Program and the results of the alternative program survey
- Presentation on commercial landings of shrimp and blue crabs from Lake Pontchartrain: 2015-2020.
- Hurricane outreach and industry planning.
- Recreational crabbing possession limit regulations.
- Funding the first Gulf RFM Audit and Fourth MSC Surveillance Audit.
- Presentation on trip tickets and crab grading.
- Seized traps and crab trap identification.
- Regulations for running another fishermen's crab traps
- Crabbing without a gear license.
- Night time crabbing in Terrebonne Parish.
- CTF seat vacancies and possible nominations and board member meeting participation.
- Officer elections.
- Consider changes to the 2019 Flood Disaster Spending Plan.
- Update and consider making changes to the recreational crabbing restrictions.
- Update on the distribution of CARES Act and the 2019 Fisheries Disaster funding.
- Harvest of blue crab by shrimping gear.
- Update on the schedule and mitigation plan for the proposed Mid-Barataria Sediment Diversion.
- Presentation on the LA search for National Estuarine Research Reserve.

FINFISH TASK FORCE

During FY 2021-2022, the Finfish Task Force met on Aug. 25, 2021 and March 24, 2022.

Agenda items discussed included:

- Shark regulations and possible state management options.
- Southern flounder management and recent legislative changes.
- Update on spotted seatrout stock status and management actions.
- National bait shortage
- Update on the status of the Louisiana Fishing Recovery Community Coalition.
- Status of Hurricane Ida fisheries industry recovery.
- Update on menhaden and the current proposal being considered by LDWF Commission.
- Officer elections.

OYSTER TASK FORCE

During FY 2021-2022, the Oyster Task Force met on July 20, 2021, Aug. 24, 2021, Sept. 28, 2021, Oct. 19, 2021, Dec. 7, 2021, Feb. 1, 2022, Feb. 22, 2022, March 15, 2022, May 3, 2022 and June 7, 2022.

Agenda items discussed include:

- Heard an overview on CARES Act and the 2019 Fisheries Disaster funding.
- Update on Mardi Gras Pass.
- Cooperative Endeavor Agreement between LDWF and Plaquemines Parish regarding the closure of Mardi Gras Pass.
- Submitting public comment on the Fisheries Disaster Spending Plan.
- Heard a legislative update on oyster related bills.
- Presentation on offshore wind development in the Gulf.
- Oyster Stock Assessment results and the 2021-2022 oyster season recommendations.
- Oyster season recommendation regarding a temporary natural reef in Lake Barre.
- Annual Update on planned coastal restoration and protection activities.
- Sustainability resolution in support of sustainability certification.

- External review of LA management in support of sustainability certification.
- New contract for the hiring of OTF legal counsel.
- Funding for the 2022 LA Alive Event and associated board member travel.
- Presentation on trip tickets.
- Temperature requirements in oyster coolers.
- POLR Program and reef cleanup after storms.
- Funding oyster promotional items to be included in sponsorship bags at the Southern Weights and Measures Association Annual Meeting.
- Buying and selling oyster seed.
- USDA COVID-19 Grants.
- Oyster tagging and gifting regulations.
- Update on oyster stock.
- Update on the 2021 Fisheries Disaster Declaration.
- Status update on the Oyster Strategic Plan.
- LDH lease checking rules and permitting guidelines.
- Update on stewardship and mitigation plan for the Mid-Barataria Sediment Diversion.
- Presentation on the Louisiana search for National Estuarine Research Reserve.
- Considered a contract and funding with OTF PR firm Beurman Miller Fitzgerald.
- Update on OTF Washington, D.C. Trip and LA Alive Event.
- Reopening of Sister Lake Public Oyster Seed Reservation.
- Considered a proposal to lower the cost associated with the Coastal Use Permit.
- Legislative proposal to change time/ temperature requirements in oyster coolers.
- Legislative proposal to make changes to oyster tagging regulations.
- Legislative proposal to make changes to regulations regarding untagged sacks.
- Officer elections.
- Update on the low salinity tolerant oyster research.
- Presentation on CRCL's Oyster Shell Recycling Program.
- Update on the Oyster Seed Ground Permit Review Board.
- Consider a legislative proposal that would allow any parish to represent the LODAG Association on the Oyster Task Force.
- Presentation on the results of the LDWF Oyster Shell Assessment Survey.
- Update on the LDAF's LA Seafood Processors Pandemic Response and Safety Program.
- Oyster Strategic Plan and the possibility of funding the closure of the Failed Bohemia Salinity Control Structure and a partial opening of the MRGO.
- Assessment of the potential value of ocean calcifiers in sequestration of atmospheric carbon.
- Funding for an oyster industry marketing campaign with WWLTV and Tegna.
- Funding for the 2023 LA Fisheries Forward Summit.

The Oyster Task Force also continued their marketing efforts including the Task Force's annual trip to Washington, D.C., where they sponsor the "Louisiana Alive" - D.C. Mardi Gras event, which draws members of the congressional delegation, staff and media, and provides an excellent platform to educate others on the importance of the Louisiana oyster industry. Additional Oyster Task Force Subcommittees met to discuss specific oyster topics.

SOCIOECONOMIC RESEARCH AND DEVELOPMENT

The Socioeconomic Research and Development Section was established in 1992 and currently resides in LDWF Office of Fisheries. The duties and responsibilities of the section are:

- To recommend, conduct and coordinate economic research studies pertaining to wildlife and fisheries resources of Louisiana and the Gulf region.
- To present research findings at appropriate professional and scientific meetings, and publish results in departmental publications and peer-reviewed scientific journals.
- To provide information and support to other sections and divisions within LDWF, as well as agencies outside LDWF, assisting them in accomplishing research needs, management tasks and short- and long-term objectives.
- To represent LDWF and Louisiana on various study groups, task forces and committees established to study, manage and improve wildlife and fisheries resources at the local, state, regional and national levels.
- To administer and implement special programs.
- To perform other activities as directed by LDWF's appointing authorities.

With assistance from the various program managers within the offices of LDWF, the Socioeconomic Research and Development Section prepares Fiscal and Economic Impact Statements that accompany the Notices of Intent for rules and regulations considered for adoption by the Louisiana Wildlife and Fisheries Commission. During FY 2021-2022, 15 Fiscal and Economic Impact Statements were developed and published along with the Notices of Intent in the Louisiana Register.

SURVEYS

SPOTTED SEATROUT MANAGEMENT OPTIONS E-MAIL SURVEY

Socioeconomic Research and Development staff conducted a survey of Louisiana residents with saltwater fishing privileges to assess their preferences for spotted seatrout management options. Invitations were sent 10,000 residents with saltwater fishing licenses, senior hunting and fishing licenses, Sportsman's Paradise licenses, and certain lifetime licenses in August 2021 by electronic mail with links to an online questionnaire.

SPOTTED SEATROUT MANAGEMENT OPTIONS WEB SURVEY

Socioeconomic Research and Development staff administered an open survey on anglers' preferences for spotted seatrout management options accessible to the public through a link on the LDWF website. The survey was conducted concurrently with the e-mail survey on the topic.

LOUISIANA NATURE-BASED OUTDOOR RECREATION SURVEY

In August and September 2021, the Socioeconomic Research and Development and the Office of Wildlife surveyed different groups of outdoor recreationists to learn more about their preferences for outdoor recreation and to investigate what might lead them to go hunting more frequently. One group consisted of Louisiana residents who acquired hunting licenses in two successive years. The other included residents who once held hunting licenses but had not acquired a license in several years.

LOUISIANA OYSTER SHELL DISPOSITION SURVEY

Louisiana House Concurrent Resolution 26 of the 2021 Regular Session of the Louisiana legislature directed LDWF to conduct a study to determine the final destination of oyster shells removed from Louisiana waters. In the autumn of 2021, the LDWF conducted a survey of Louisiana oyster dealers to assess the sales of oysters in two different forms (whole oysters or shucked oysters) to purchasers in Louisiana or in other states to address this issue.

PUBLICATIONS, REPORTS AND PRESENTATIONS

Isaacs, Jack C. "Imports of Crab Products." Presentation Given to the Louisiana Blue Crab Task Force Meeting, August 2021.

Isaacs, Jack C. "Imports of Shrimp Products." Presentation Given to the Louisiana Shrimp Task Force Meeting, August 2021.

Adriance, Jason, and Jack C. Isaacs. "Summary of a Spotted Seatrout Surveys." Presentation Given to the Louisiana Wildlife and Fisheries Commission, September 2021.

Tabarestani, Maryam, and Jack C. Isaacs. "A Few Notes on Imports of Shrimp Products into Europe." Presentation Given to the Louisiana Shrimp Task Force, October 2021.

Isaacs, Jack C., and Jason Adriance. "Summary of a 2021 Spotted Seatrout Surveys." Presentation Given to the Louisiana Wildlife and Fisheries Commission, November 2021.

Isaacs, Jack C. "Commercial Landings of Shrimp and Blue Crabs from Lake Pontchartrain: 2015-2020." Presentation Given to the Louisiana Shrimp Task Force, December 2021.

Isaacs, Jack C. "Commercial Landings of Shrimp and Blue Crabs from Lake Pontchartrain: 2015-2020." Presentation Given to the Louisiana Blue Crab Task Force, December 2021.

Tabarestani, Maryam, and Jack C. Isaacs. "Trend in Commercial White Shrimp and Brown Shrimp landings by Size Category: 2010-2020." Presentation Given to the Louisiana Shrimp Task Force, December 2021.

Isaacs, Jack C. "Imports of Frozen Shell-On Shrimp by Size Categories." Presentation Given to the Louisiana Shrimp Task Force, April 2022.

West, J., E. Lang, and P. Cagle. Update Assessment of Blue Crab *Callinectes sapidus* in Louisiana Waters. Published on Behalf the Louisiana Department of Wildlife and Fisheries, April 2022.

Cagle, P. and J. Isaacs. Louisiana Blue Crab Fishery Management Plan. Published on Behalf the Louisiana Department of Wildlife and Fisheries, February 2022.

REPRESENTATION ON TASK FORCES, STUDY GROUPS AND COMMITTEES

During FY 2021-2022, Socioeconomic Research and Development staff members represented LDWF on the following task forces, study groups and committees:

- Louisiana Blue Crab Task Force
- Louisiana Finfish Task Force
- Louisiana Gulf Hypoxia Working Group
- Louisiana Shrimp Task Force
- Socioeconomic Scientific and Statistical Committee of the Gulf of Mexico Fishery Management Council

ONGOING 2010 *DEEPWATER HORIZON* OIL SPILL ACTIVITIES

DEEPWATER HORIZON NATURAL RESOURCE DAMAGE ASSESSMENT RESTORATION ACTIVITIES

RECREATIONAL USE

The Consent Decree was finalized on April 4, 2016, which resolved $14.9 billion in claims against the 2010 *Deepwater Horizon* oil spill responsible parties and set the stage for the next phase of restoration activities. Louisiana is set to receive a total of $5 billion for Natural Resource Damage Assessment Restoration funding out of the $8.8 billion to be distributed Gulf-wide. Of Louisiana's portion, $60 million has been earmarked to provide and enhance recreational opportunities. In July 2018, two recreational use plans were finalized:

1. Recreational Use Restoration Plans/Environmental Assessments
2. Provide and Enhance Recreational Opportunities, which reallocated the original $22 million in early restoration funds towards other proposed alternative projects that would restore for lost recreational use in Louisiana, with specific focus on enhancing recreational fishing opportunities.

- Elmer's Island Access Project
  - All recreational enhancements, including road improvements, kayak launch installation, culvert installation, and bird observation tower installation were completed in FY 2021-2022.
  - The shuttle service contract and trash contract are on-going.
  - Post-construction monitoring underway, public use information now documented by WMA Access Permits.
- Statewide Artificial Reefs
  - Construction phase of the Statewide Artificial Reef Project completed.
  - Biological monitoring on 10 coastal reef sites enhanced is ongoing.
- Lake Charles Science Center and Educational Complex
  - Engineering and design nearing completion; construction set for spring/summer 2023.

LIVING COASTAL AND MARINE RESOURCES – OYSTERS

Louisiana Trustee Implementation Group selected three projects to restore for injuries to oysters in its Final Restoration Plan/Environmental Assessment #5, Living Coastal and Marine Resources: Marine Mammals and Oysters. One project will fund 10 years of operations, and monitoring of products, for Michael C. Voisin Oyster hatchery, along with programmatic projects for creation/enhance-

ment of brood reefs and cultch plants, representing Louisiana's full $26 million allocation of oyster restoration dollars.

1. Enhancing Oyster Recovery Using Brood Reefs Project
   - This programmatic project has a total budget of $9,701,447, will be used for the construction of multiple reefs and to conduct programmatic activities (e.g., modeling, data collection, conducting bottom surveys, etc.) which can help inform crucial locations for siting additional brood reefs to maximize benefits.
   - Four specific locations approved in RP/EA#5 have undergone construction, monitoring initiated:
     - Lake Machias - 11/19/21
     - Mozambique Point – 11/21/21
     - Karako Bay - 12/03/21
     - Petit Pass - 12/03/21
2. Cultch Plant Oyster Restoration Project
   - This programmatic project has a total budget of $10,070,000, and will be used to construct multiple reefs in support of LDWF Oyster Strategic Plan.
   - Two specific locations have undergone construction, monitoring initiated:
     - Sister (Caillou) Lake - September 2021 (Terrebonne Basin)
     - Drum Bay - June 2022 (North Pontchartrain Basin)

GULF STATES MARINE FISHERIES COMMISSION

Gulf States Marine Fisheries Commission, a compact among the five Gulf states, is charged with promoting better utilization of the marine fisheries including finfish, shellfish and anadromous species through the development of programs for the promotion and protection of these fisheries while preventing any waste of these resources.

Fisheries biologists and economists participate in a number of Gulf States Marine Fisheries Commission programs and initiatives including Aquatic Invasive Species, Interjurisdictional Fisheries, Fisheries Information Network, and economics programs, as well as providing their expertise in the development of management recommendations. In addition, Fisheries biologists serve on a number of Gulf States Marine Fisheries Commission Technical Coordinating Sub-Committees including Data, SEAMAP, Habitat, Artificial Reef, Outreach, and species-specific committees and working groups. Fisheries' biologists were present at meetings and discussions pertaining to the various SEAMAP programs. LDWF biologists participated in the creation of various fishery management plans for Gulf species.

GULF OF MEXICO FISHERY MANAGEMENT COUNCIL

The Gulf of Mexico Fishery Management Council is responsible for the management of commercial, recreational and for hire fishing activities in the Exclusive Economic Zone (EEZ), Gulf waters from the state territorial sea out to 200 miles offshore. The Council prepares Fishery Management Plans and amendments to these plans. Methods of regulation include quotas, size limits, bag limits, seasons, trip limits and other tools fisheries managers employ to control both recreational and commercial harvests.

The head of each state's fisheries division has a seat on the council along with representatives from the fishing industry. Louisiana's seat is assigned to Assistant Secretary Patrick Banks. His designee for Council issues is Chris Schieble, who is delegated to act on his behalf. In addition to the council seat, Office of Fisheries employees participate in advisory roles on various panels and committees: Outreach, Data Collection; Habitat Protection; and Scientific and Statistical Committees for red drum, mackerel, reef fish, shrimp, and socioeconomics. LDWF biologists are also part of the SEDAR pool, a panel assigned to producing the Council's stock assessments.

A list of the Council's Fisheries Management Plans includes: Reef Fish, Coastal Migratory Pelagic, Red Drum, Shrimp, Lobster, Stone Crab, Coral, Aquaculture and Essential Fish Habitat. The council meets five times a year to work on amendments regarding these Fisheries Management Plans. Louisiana is considered a leader in the council's fishery management process with creative and out-of-the-box methodologies.

The Council took final action on Amendment 34 to the Coastal Migratory Pelagic Fishery Management Plan, which addresses South Atlantic Migratory Group King Mackerel Catch Levels and Atlantic King and Spanish Mackerel Management Measures. The Council accepted a draft Fishery Ecosystem Plan as a framework to begin discussions on how to develop a more fleshed out fishery ecosystem plan that develops the framework for identifying, prioritizing, and operationalizing fishery ecosystem issues. The Council took final action on Framework Amendment 11 and chose to reduce Gulf king mackerel catch limits through the 2023-2024 fishing year. The Council requested that NOAA Fisheries implement an Emergency Rule to modify to the 2022-2023 recreational fishing season for greater amberjack to reduce the potential of recreational overharvest this year and subsequent paybacks in the 2023-2024 recreational fishing season. The Council modified the greater amberjack recreational season to only be open in September and October 2022. The Council reviewed management options for gag grouper and supported an interim management measure to modify the recreational season to open on Sept. 1 and remain open through Nov. 10. Council took final action on a framework action to modify red snapper catch limits based on new catch advice generated using updated estimates of absolute abundance of red snapper derived from the Red Snapper Count by LGL Ecological Associates, Inc. (Louisiana). Louisiana continued with the ability to manage the private recreational red snapper fishery in both state and federal waters during the 2022 private recreational red snapper season. This once again allowed Louisiana anglers more quality access to the fishery.

Further information can be located at *gulfcouncil.org*.

REPORT ACRONYMS

CITES - Convention on International Trade in Endangered Species of Wild Fauna and Flora
CPRA - Coastal Protection and Restoration Authority
DMAP - Deer Management Assistance Program
FY - Fiscal Year
LDNR - Louisiana Department of Natural Resources
LDWF - Louisiana Department of Wildlife and Fisheries
LDWF-LED - Louisiana Department of Wildlife and Fisheries Law Enforcement Division
LSU - Louisiana State University
NASBLA - National Association of State Boating Law Administrators
NOAA - National Oceanic and Atmospheric Administration
RWR - Rockefeller Wildlife Refuge
SCS - State Civil Service
SEAMAP - Southeast Area Monitoring and Assessment Program
SGCN - Species of Greatest Conservation Need
USACE - U.S. Army Corps of Engineers
USDA - U.S. Department of Agriculture
NRCS - USDA Natural Resources Conservation Service
USFS - U.S. Forest Service
USFWS - U.S. Fish and Wildlife Service
USGS - U.S. Geological Survey
WDP - Wildlife Diversity Program
WLWCA - White Lake Wetlands Conservation Area
WMA - Wildlife Management Area

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