

Louisiana Natural Resources News

Newsletter of the Louisiana Association of Professional Biologists
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Hurricane Katrina, Hurricane Rita, and Drought Set a Rough Table for Ducks in Louisiana. Larry Reynolds, LA Department of Wildlife & Fisheries.



(Photo by M. Pieron)

In the past two months we have seen heart-wrenching devastation and human suffering from two major hurricanes pummeling our state. Many of you reading this Newsletter have experienced such tragedies first-hand as victim, rescuer, or both. As part of our recovery from this natural disaster, professional biologists must return our attention to the natural resources we manage. Waterfowl migrating into Louisiana this fall will face

tough challenges not only in the wake of these two hurricanes, but also as result of long-term rainfall shortages. Hurricanes AND drought just sounds bizarre, doesn't it? But that is exactly where we find ourselves in early November.

Hurricane Katrina raged through southeast Louisiana on August 29th, pushing a 12-20 foot surge of water over and through everything in Plaquemines, Jefferson, Orleans, and St. Bernard Parishes. Well-known waterfowl habitats including Pass-a-Loutre WMA, Delta NWR, and marshes around Delacroix were hit hard. Emergent vegetation and substrate were scoured away in many places, and much of what held firm, if accustomed to fresher water, was burned by the salt water. Submerged aquatic vegetation, an important food for migrating and wintering ducks, suffered the same fate. The "floatant" marshes in the Breton Basin were dislodged, stacked-up, moved around, and blown away.

Because we do not regularly monitor waterfowl habitat quality in the state, the true impact of Katrina will never be fully understood. We have no long-term baseline data sets with which to compare post-hurricane conditions. On a positive note, we suspected that one important food source at the mouth of the Mississippi River, delta duck potato (*Sagittaria platyphylla*), may have already set tubers, and there was still time for some late growth of submerged aquatics elsewhere. However, even best-case scenario, it's certain that the capacity of the wetland habitat in southeast Louisiana to support ducks has been markedly reduced.

Katrina's wrath seemed like just a warm-up for the havoc wreaked by hurricane Rita, which came ashore on September 24th near Johnson's Bayou. This second storm sent another surge of seawater over the chenier ridges and across the marshes all the way to the rice-growing areas of Cameron and Vermilion Parishes. The storm surge came inland, and with it saltwater that inundated marshes all along the coast. Areas of New Orleans were reflooded, levees at Pointe-aux-Chenes WMA and the White Lake Preserve were breeched, and vegetation used by feeding ducks at Atchafalaya Delta WMA to Sabine NWR was salt-scalded.

The famed waterfowl marshes of southwest Louisiana were certainly the hardest hit. On October 6th, nearly two weeks after the hurricane, we flew from the Atchafalaya River west to Grand Chenier and saw most of the marsh still flooded with turbid, saline water at about 20 ppt. The live oaks seemed ghostly gray and the marsh was littered with houses, fuel tanks, and dead livestock. From the airplane, we couldn't see or sample the vegetation, but few favored duck-food plants can survive that level of flooding in such brackish water, certainly not in the preferred fresh and intermediate marshes. Almost eerie was the near complete lack of ducks. We flew from the Atchafalaya River to Grand Chenier, then north to Lake Charles, and we saw exactly three mottled ducks.

In the rice-growing region, the news was better. Where there was good hydrologic separation between the Gulf Intracoastal Waterway and the fields, vegetation was green and we found concentrations of blue-winged teal, mottled ducks, and black-bellied

whistling ducks. However, in many locations, saltwater covered a number of agricultural fields leaving habitat that was not only unattractive to wintering ducks, but also a soil-salinity problem for the farmer.

Still, we looked toward the positive. If we could get some good flushing rainfall to move freshwater through the system, the recovery of the farm fields and marsh could be accelerated. But we've seen virtually none. It had been so dry prior to the hurricanes that many of us were actually looking forward to the rainfall predicted by models showing Rita striking the central Texas coast instead of us. Since then, the drought has continued, and wetland habitats from northwest to northeast Louisiana, Arkansas and Mississippi are dry and dusty. We are pumping on our WMAs, but the price of diesel has excluded many privately-managed lands from pumping-up acreage they have in the past.

Without a good toad-strangler of a rainstorm or two, it looks like a tough year to be a duck in Louisiana.

Assessing Coastal Impacts of Katrina and Rita. Darin Lee, LA Department of Natural Resources.

The coastal marshes of Louisiana have taken the hit of 2 major hurricanes with mixed results. Hurricanes are a natural part of the system and marshes tend to do much better than we do in dealing with hurricanes. But marshes still sustain damages and as most are aware, the continued loss of Louisiana's coastal wetlands and the efforts to restore them is exacerbated by these storms. Besides the wildlife, fisheries, and human impacts; the wetlands themselves suffered from several impact types. Physical removal of marshes (soil and vegetation ripped up and moved) (Picture 1); the erosion of shorelines, both sandy and clay (Picture 2 & 3); the drowning of marshes for long periods, and the introduction of saltwater from storm surges (Picture 4) into inland fresh ecosystems are among the major affects hurricanes can have on these systems.

The wetlands east of the Mississippi River and those just West of it, suffered a lot of physical removal as the powerful winds of Katrina moved through the area. Large strips of marsh can be seen removed from photos in upper Breton Basin and along some of the Plaquemine marshes in Barataria Basin.



Picture 1. Severely eroded marsh in the area around Caernarvon. Note the overturned marsh clumps in the open water and partially filled canal. (LDNR/OCRM File Photo)

Also, the already low and narrow shorelines of the Breton and Chandaleur Islands were heavily impacted, and these islands seemed to be eroded very badly. The USGS and others have photos available and Light Detection and Ranging (LiDAR) Surveys have been flown to determine how bad these islands were impacted. Discussions with USGS



Picture 2. Timbalier Island CWPPRA (TE-40) Project area's eastern tip Post-Katrina. (LDNR/OCRM File Photo)

persons indicate they were difficult to even find shortly after Katrina. However, we must remember that some natural sand replenishment will occur as waves push some sand back onshore. The question is how much sand is available? Further inland, into the Ponchartrain and Manchac areas, is where some salt burn is noted, but it seems minor compared to the physical damage of marshes in Breton Basin.



Picture 3. Timbalier Island CWPPRA (TE-40) Project area's eastern tip Post-Rita. (LDNR/OCRM File Photo)

West of Bayou Lafourche, in the Central portion of the coast, the marshes fared pretty well. This area was between the storms and did not take the brunt of either storm's winds. Of course, there are areas of physical removal and some shoreline erosion along the barrier islands, but comparatively speaking this area fared ok. The major culprit here may be salt water, since storm surges sent saline water deep into fresh water areas. Reports continue to come in that freshwater vegetation continues to show deterioration as time passes. The waters here are less impounded than waters in the western portion of the state, but the lack of rain in the last few weeks and low river levels has not helped to dilute any remaining salinity. Also, the barrier shoreline although relatively undamaged by Katrina was eroded by Rita.

The western portion of the state has experienced mainly flooding and salinity problems for Hurricane Rita. Natural drainage patterns that have been altered make the waters recede slowly in these areas and prolonged flooding can kill vegetation. Additionally, salinity continues to damage fresh areas as it encroaches. Reports are that even some rice fields immediately adjacent to coastal areas have experienced some salt water damages. This area, even though it received less physical removal of marshes, may end up worse than eastern areas due to trapped saline waters for long periods.

The next steps for coastal restoration will be to complete an assessment of all the existing and soon to be constructed projects. Then plans will be made for repairs and responses to salinities will continue to be accessed and possibly some project changes



Picture 4. Fresh marsh vegetation, including water hyacinths, dying at Mandalay National Wildlife Refuge. The American Lotus in the background usually senesces this time of year, but salt accelerated the process. (Photo by Yakupzack, USFWS)

and reprioritizations will be done. An aerial photo flight of the coast was scheduled this fall for a program called Coastwide Reference Monitoring System - Wetlands (CRMS - Wetlands) and this will be done as scheduled. There may be added areas mapped based on needs for storm damage info since CRMS –wetlands was not planned to analyze the whole coasts photography.

Overall, this continued stress to Louisiana's wetlands already under siege from a wide variety of stressors did not help. Ecologist tend to talk in terms of persistence and resiliency, and I think we will see some of both as we continue to look at these wetlands and attempt restoration. We must remember that Hurricanes have been impacting these marshes for millennia, but as our impacts have changed the system, the wetlands seem to show less persistence and resilience to the impacts of these storms.

Additional photos from the LA Dept Natural Resources, Office of Coastal Restoration & Management are available at their ftp site below. They are not paired, but may be familiar areas you can look at.

<ftp://ftp.dnr.state.la.us/pub/CED%20Field%20Engineering/>

**Preliminary Alligator Impact Assessment Due to Hurricanes Katrina and Rita.
Dr. Ruth Eisey, LA Department of Wildlife & Fisheries.**

Wildlife resources in coastal Louisiana were hard hit by Hurricanes Katrina and Rita, including numerous marsh species such as the American alligator, *Alligator mississippiensis*. Although alligators are able to tolerate low level salinities, they prefer fresh and intermediate marsh types and long term effects of the storm surge in coastal parishes remains to be seen.

Some direct mortality to alligators was seen, but appears limited thus far. Numerous alligators were displaced and the Department has received "nuisance" alligator calls in some cases. Fortunately alligators are highly mobile and often travel long distances under normal conditions.

Hurricane Katrina struck in late August, by which time most wild alligator nests had already hatched. This may have prevented direct immediate flooding of alligator eggs, but certainly also caused some displacement of newly hatched alligators, which are less tolerant of salt water than older alligators, based on laboratory studies. Fortunately much of the natural mortality expected from storm events such as these is circumvented by Louisiana's alligator egg ranching program, whereby landowners allow alligator farmers/ranchers to collect alligator eggs from their wetlands, after conservative quotas and permits are established by the LDWF.



(Photo by Phillip Trosclair)

The wild alligator season was set to open this year on September 7th. Due to Katrina relief efforts, many alligator buyers, dealers, processors, and trappers were unable to locate refrigerated trucks, ice, or fuel.

To properly process our Louisiana alligator hides and maintain a high quality product, we elected to delay the opening of the alligator season until September 14th, when conditions would be improved. LDWF also extended the 30 day season until October 13th. Some trappers in hard-hit parishes such as Plaquemines, Orleans, St. Tammany and St. Bernard may have been unable to trap due to being displaced or loss of equipment; we estimate about 1800 alligators will not be harvested there due to hurricane impacts.

Hurricane Rita then headed to the SW Louisiana coast and caused evacuations around September 21-22. Many alligator trappers had already filled their quota of tags, though

some larger landowners had not yet completed their tag allotment. To allow these trappers time to try and fill their tags, we extended the season until October 30th.

Some losses of captive alligators and alligator farming facilities occurred as a result of both storms. These losses of live alligators were not as severe as we had initially feared, as many farmers were able to move stock to other facilities. However, large financial losses were suffered by several alligator farmers as a result of physical plant and equipment damages.

An enormous concern for the Department is habitat loss due to salt water intrusion and increasing salinities in marshes that were fresh or intermediate, and if they will recover by the next alligator nesting season. Alligator population estimates are indexed by coastal nest counts, and quotas for wild adult alligator harvest parameters and egg collection may be impacted in some areas if deleterious habitat changes persist. We are hopeful that marshes will recover quickly, as was seen in areas similarly affected by Hurricane Andrew in 1992. Alligator nesting in areas impacted by Andrew rebounded by the next year.

Initial helicopter surveys done on September 30th estimated salinities as high as 20 -24 ppt in some areas affected by Hurricane Rita. Continued monitoring will determine if and when these salinities return to pre-storm conditions.

Potential Impacts to Deer from Hurricanes Katrina and Rita. Scott Durham, LA Department of Wildlife & Fisheries.

The reports sounded ominous as surveys and assessments were made by LDWF personnel in the hard hit areas of the eastern and western coastal zones.

Plaquemines-St. Bernard Parishes-
"Severe devastation and impounded water. Blow outs on the protection levee and cuts on the Mississippi River levee. Vegetation and debris piles everywhere. Trees blown down and severely browned out marsh grass. Dead cattle observed in the marshes. Wind torn marsh grasses.



(Photo by M. Pieron)

Submerged aquatic vegetation was not observed. More broken up in appearance than normal. A few dead deer were observed. Wax myrtles all brown. Entire spoil area appears to have been inundated. Deer and small mammals likely impacted by flood waters."

St. Tammany Parish- "Pearl River WMA- Tree damage appears to be from 10 to 90%, with perhaps an average of 50 to 70% on the upper end. Oaks and other deciduous hardwoods appear to have suffered the most with severe blow-down damage."

Iberia-St. Mary- "The storm surge in the region caused severe burning of upland vegetation, moderate to severe burning of fresh marsh vegetation and light burning of brackish marsh vegetation. Deer browse availability is severely impacted in the region. Reports of deer mortality have been received from hunters and landowners in this region. Carcasses of dead speckled trout and redfish were observed in a sugarcane field just south of Hwy 90 at Baldwin."

Cameron-Vermillion Parishes- "Vegetation was severely impacted by storm water scalding and flooding, which will cause a sharp decrease of food resources for deer and other wildlife species. Some deer mortality was reported, but others observed deer reaching higher ground."

Hurricanes Katrina and Rita hit the Louisiana coastal zone very hard in 2005. Impacts to deer and other wildlife species were, and still are substantial. Direct mortality of deer occurred as result of drowning, overexertion, and stress from swimming and climbing onto higher structures in an attempt to survive the storm surge. However, the greatest impact of the storms was not direct mortality; rather it is the alteration of the habitat that provides food and cover for deer and other species.

The loss of mast trees, both hard and soft will cause a negative long term effect. Hard mast, such as acorns, are a primary food source for deer in fall/winter and may even be available in spring and summer when mast crops are abundant. In areas of low soil fertility, hard mast is critical for deer to achieve maximum body and antler development. Many hardwood creek bottoms were demolished by Katrina. Invasive species such as Chinese privet and tallow will become established and dominate desirable hardwood regeneration, unless ceaseless efforts are made by landowners and managers to

control such advances. Losing much of the hardwood component in hurricane affected regions will likely have the single most dramatic, long term (though not permanent if management actions are taken) impact on deer populations.

In the coastal marshes, permanent loss of habitat occurred as result of wind and storm tides that ripped away marsh grasses, forbs, and soil. Much of this loss was in the more brackish and salt marshes where deer are not abundant. However, the loss of any marsh is a negative for associated wildlife species, especially the loss of fresh marsh. This loss equates to proportionately less deer habitat, lower carrying capacity, and fewer deer.

Loss of food resources for deer was extensive across the coastal zone. Vast areas of coastal marsh were inundated with high water levels from the storm surges. Estimates suggest 50 to 100% short term loss of understory vegetation on flooded spoil banks, wetland forests, and scrub/shrub habitats. Most of these plant species are utilized by deer or other wildlife species. In the fresh to intermediate marshes, many plant species were scalded and browned. Full recovery will take time, but remarkably, only weeks after the flooding, many plant species in these habitats were rapidly recovering. Browse species such as trumpet creeper, *Smilax* sp., rattan, honeysuckle, willow, alligator grass, golden rod, smartweed, and *Sagitaria* sp., were observed with new vegetative growth or flowers.

Not all impacts were completely negative for deer in parts of the affected regions. In southeast Louisiana, Katrina not only devastated the coastal zone, but barreled her way far into the dairy farm and timber producing regions of the Florida parishes and the Pearl River basin. In this region, the deer herd should respond favorably to the effects of Hurricane Katrina in the short term. Tree loss and canopy openings will allow sunlight to reach the forest floor and trigger a flush in vegetation and an increase of browse and cover for deer across a large region. As sunlight reaches the forest floor and stimulates growth of choice deer foods such as *Rubus* sp., *Smilax* sp., elderberry, and French mulberry, deer populations will likely expand to some degree. Individual deer health and vigor may also improve if densities are kept in balance with habitat conditions. Abundant food and cover, along with the sheer number of blow-downs increasing the difficulty of hunter access in the deer woods, may give deer the ability to reach higher age classes and maximum growth in certain areas within the next 8-10 years.

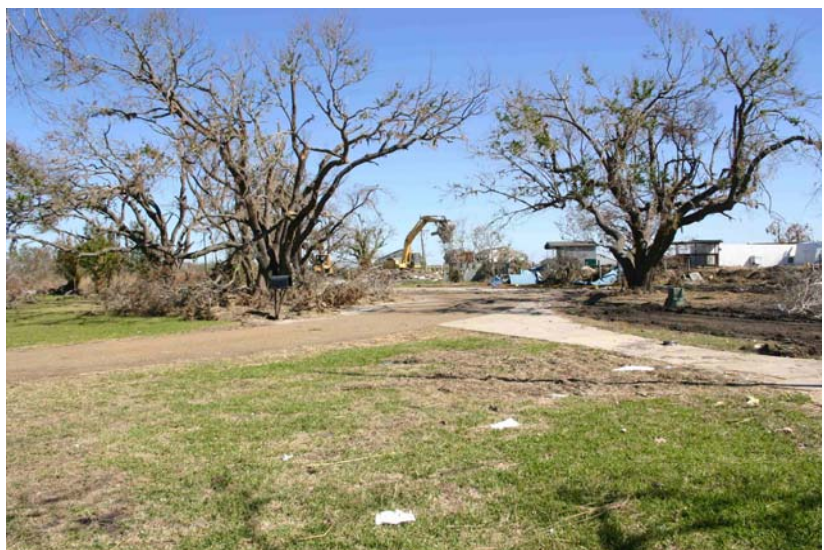
Deer were displaced into areas that were not part of their home ranges during and after these hurricanes. In some areas, such as Pass A Loutre, the full affect of such a devastating hurricane is not yet known. Further surveys and population estimates will be made in the future to determine if extraordinary management action is necessary. In other areas that did not get the full affect of either storm, such as the Atchafalaya Delta, mortality is thought to be rather low and deer habitat recovery appears to be quickly occurring.

After high water events, deer are usually quick to return to their home ranges when the water recedes. Where food and cover are still available or recovering with new growth, deer should move back into their home ranges. During surveys of hurricane affected regions, we found no evidence of any deer remaining bunched up in small or isolated pockets or on high ground. Because of the short term lack of deer browse, it will be important that deer numbers are within the new carrying capacity of the landscape. Because of this necessity, hunting will be necessary to remove surplus deer to keep the population at a healthy, sustainable level. With the present stressed state of the coastal zone, not removing surplus animals could facilitate deer disease, stress, and further mortality.

Hurricanes are a part of the natural cycle that we, as short-lived humans must endure. They play an important role in the long term health of the marsh by occasionally setting back plant succession, clearing invasive choked ponds, trenasses, and flotant. Living in the rich, but vulnerable coastal zone presents challenges for those that choose to be there. For many of us, there is no other region in the world with more diversity or natural beauty. It is hard not to want to be on an ancient live oak chenier. Like our ancestors and the Native Americans before them, we still want to shrimp, fish, trap, and hunt migratory waterfowl and big-footed deer.

Sabine Gets Salt and Debris. Steve Reagan, US Fish and Wildlife Service

As we get past the damage to our homes and communities caused by Hurricane Rita and move forward with recovery, our attention is diverted to the destruction sustained by our National Wildlife Refuges, coastal habitats, and the organisms that thrived there. The impacts of saltwater intrusion and oxygen depletion are revealed by lifeless freshwater fish floating in devastated waterways that weeks ago, were teeming with aquatic life.



Picture1. Sabine Headwaters post-Rita

(Photo by F. Rohwer)

Many local birds were unable to escape the effects of hurricane Rita's damaging winds. Of those that survived, many have broken wings or damaged legs. Even those that escaped direct physical damage may suffer, as the habitat on which they depend for survival has been damaged by salt water intrusion or coated with toxic materials.

Large portions of Sabine National Wildlife Refuge are now covered by remnants of the hurricane, including dislodged marsh grass, chemical drums and tanks, house goods and construction materials. As Picture2 shows, there is now a 5 mile by 1 mile debris field south of the pool that used to be the canal hunters and anglers used to access the refuge.



We'll be lucky to get it opened for public entry in the next year, as most of the buildings are scheduled for demolition. Cameron Prairie was inundated by the storm surge as well. All of the non-woody vegetation on the refuge is dead, but luckily the buildings made it through the storm. The snipe hunt is currently still on for February, and there is still a possibility of duck hunting on Cameron Prairie and Lacassine. However, current conditions pose some safety concerns that need addressed prior to making such decisions.

Even though the winds are gone and the sun now shines, the impacts of the storm will continue to persist. Without a flush of fresh water in the form of rain, migratory birds may find little use of the Refuges in southwest Louisiana. Much, but not all, of these fish and wildlife habitats will heal. This is not the first hurricane this habitat has endured, nor will it be the last. Recovery takes time, and what does return may not be exactly what was there before.

Picture 2. Debris field blocking Sabine NWR access.

(Photo by Diane Borden-Billiot/USFWS)

Johnson Receives Best Presentation Award at Annual Symposium



The annual LAPB symposium, held in August, was another great success. Many of our members, both old and new, made it out for the two day event. Though there were numerous excellent posters and presentations, this year's best presentation award went to LSU graduate student Erik Johnson. Erik presented findings from his masters work which aims to evaluate the effects of fire on body condition, home range, and post-migration movements of wintering Henslow's sparrows in southeastern Louisiana. Congratulations Eric!

The Benefits of Crawfish Aquaculture to Louisiana's Waterbirds. Jay Huner, University of Louisiana at Lafayette.

Louisiana boasts over 600,000 acres of agricultural wetlands. These habitats are primarily utilized for the production of rice, but aquaculture production is also a major component of the industry. Crawfish aquaculture compliments rice culture nicely, as warm weather rice fields accommodate crawfish aquaculture in cooler months. Crawfish production can be integrated into rice production in one of two ways: both crops are grown in the same 12 month period, or some form of rotation involving rice, crawfish, fallowing, and row crops is implemented. Currently about 130,000 acres of Louisiana's agricultural wetlands have a crawfish production component at some point during the year.

Aside from the excellent resting and loafing areas contained in crawfish ponds, they also provide food resources for waterbirds that rival and even exceed those found in natural wetlands. In fact, the loss of over 1.5 million acres of coastal wetlands since the 1950s makes these so called "artificial" wetlands that much more significant for local and migrant waterbird species in coastal Louisiana. Once these ponds are filled with water in the fall, they quickly develop into an invertebrate rich environment that is highly attractive to carnivorous birds such as egrets, herons, and ibises. They are joined in the

winter and spring by large numbers of cormorants, gulls, and terns. Crawfish ponds are also utilized during spring and summer draw downs by shorebirds and wading birds including yellowlegs, dunlins, peeps, and dowitchers.

Regardless of when crawfish ponds are drained, they become a sea of white, blue, gray, and pink wading birds, foraging on stranded crawfish, fish, tadpoles, and macro-invertebrates. This dependable food source provides sustenance to wading birds preparing to nest, nestlings during the nesting season, and post breeding birds dispersing from rookeries. In fact, it has demonstrated that the dramatic increase in wading bird diversity and density in southern and central Louisiana since the 1950s is, in large part, due to the expansion of crawfish farming during the second half of the 20th century. Up to 80 species of waterbirds utilizing agricultural wetland habitats, and over 275 species associated with adjacent riparian habitat have been documented in Louisiana and the upper Texas coast.