

# Oil and Birds: *Too Close for Comfort*

Louisiana's Coast Six Months into the BP Disaster



# INTRODUCTION

The images were wrenching. An oil-slathered bird struggling to free itself from the gooey muck. Vulnerable chicks nestling up to the stained orange-brown belly of a mother bird. These images mobilized a country. And rightly so. Thousands of birds from dozens of species are known to have succumbed to a slurry of oil and other chemicals. The known numbers are low. The unknown are potentially much higher.

The country's largest maritime oil disaster in history didn't end when the well was capped. Not for the communities of the Gulf, and not for the birds. The most visible oil was out of sight, many exhausted volunteers returned to other responsibilities, and the majority of the media left, but the residents of the region remained, including the birds. And so did the dangers.

Almost six months after oil began pouring into the water, the National Audubon Society sent a team of scientists back to the Louisiana Gulf to explore one fundamental question: How safe is it for the birds? For the birds that remained to complete their nesting duties? For the birds that stopped to feed on their migrations farther south? For the birds massing on their traditional wintering grounds? For the birds that will return in a few short months to attempt once again to bring new life to the coast?

What did the scientists see? They saw birds and they saw oil. And too often they saw them together.

The oil exposed during low tides, oozing up through layers of sand, or trapped in thick mats of marsh grass is but the latest stress on these birds and the entire ecosystem. The Louisiana coast has been starved of replenishing sediments for decades, invaded by canals, and opened to an eroding sea. Such assaults have weakened the system, potentially courting collapse of a natural cornucopia that feeds not just birds but many marine creatures and much of our nation.



The birds share a dependence on the natural bounty and health of the region with the people living there. Will this vital ecosystem continue to support healthy and thriving wildlife and communities?

As our scientists confirmed, the largest uncontrolled science experiment in our country is in many ways just beginning. Only long-term study, attention, and efforts at system-wide restoration will answer the questions.

Audubon will remain as faithful to the region as its birds and its people, calling for continued cleanup of known risks, vigilance against future threats, and a national commitment to restoring one of the world's most productive river delta systems . . . for the birds, and for us all.

*ABOVE: Black Skimmers join a mixed flock of gulls and terns on Louisiana beach/ Kim Hubbard*

*OPPOSITE PAGE, MAIN PHOTO: Breton Island, an Important Bird Area and part of a National Wildlife Refuge, encircled by oil boom/Gerry Ellis; INSET: Oiled Brown Pelican in early days of the spill/Kim Hubbard*

## TURNING TRAGEDY TO OPPORTUNITY

The BP oil disaster created unprecedented awareness about the value of healthy Gulf ecosystems to birds, to people, and to the future. Audubon pledges to further its mission to:

- Rebuild, restore, and conserve coastal wetlands to provide essential storm protection, economic benefits, and wildlife habitat.
- Reestablish natural Mississippi River delta-building processes to reverse runaway coastal erosion.
- Stabilize or increase populations of Gulf-dependent birds.

Through long-term commitment, we can go beyond recovering from this assault on a precious landscape to improving its bounty for birds and people. Necessary technologies are known and available. Political will and support are still needed. Together, we can make the difference now and for tomorrow.

**There's beauty, abundance and prosperity in the Gulf. It's time we cared enough to protect them.**

*David Yarnold, Audubon President & CEO*





# OBSERVATIONS

## *Birds Faithful to Risky Habitats*

The Louisiana coastal sites surveyed by Audubon science teams were alive with birds, representing the range of species typical of the region in September. Teams recorded species and numbers during walks of 23 separate one-kilometer transects (sample sections of habitat) and at multiple stationary locations. In all, they reported nearly 10,000 individual birds, including terns and large numbers of both mature and juvenile Brown Pelicans (recently removed from the endangered species list). The young were a welcome sight given the concerns generated by disaster coverage filled with images of oiled and dying pelicans. It is far too early to evaluate the success of the 2010 breeding season for this recovering species, but large numbers have successfully fledged to face the additional challenges that lie ahead.

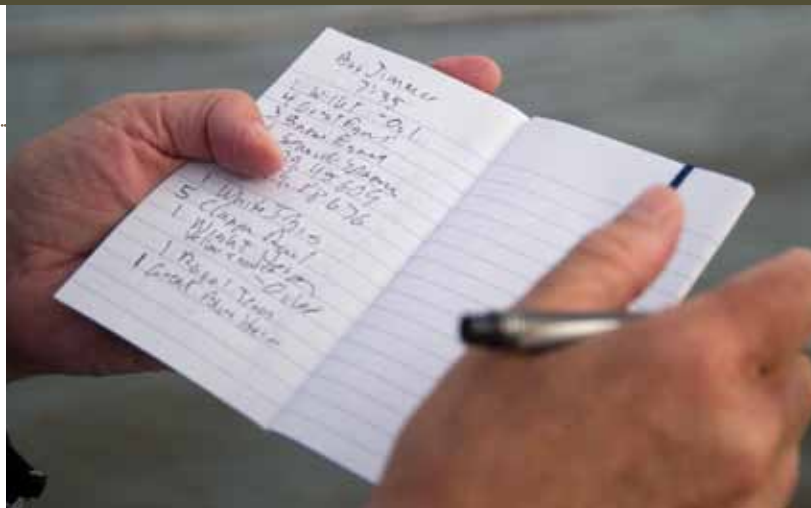
Survey teams detected oil on only three birds during the September count (one Willet and two American Avocets). However, the lack of visible oil does not mean the birds they saw are safe. Overall bird health cannot be assessed through observation alone. Teams could not determine how many birds might have ingested or otherwise come into contact with oil, dispersants, or other disaster-related chemicals. The long-term implications of ingestion or contact are also unclear (see pages 8–9) and may require years of monitoring and biological research to assess.

Whatever the risks, Audubon's survey revealed that birds continued to face ongoing exposure to oil and associated

chemicals as the six-month anniversary of the disaster approached. The threat stems from what at first glance appears reassuring: the abundance of birds in the same places where they are usually found, mainly on the barrier islands near their food sources and far from land predators.

Teams saw no indication that birds moved from their preferred habitat—even if it was oiled during the spill—to other oil-free areas. Indeed, surveyed western beaches that received little or no oil sheltered fewer birds, as would have been expected in any case because of their less varied array of habitats. In contrast, the spits and barrier islands in eastern sections of the Barataria-Terrebonne Important Bird Area—hard hit by oil and in varying stages of cleanup—were covered with resting and foraging pelicans, terns, gulls, skimmers, and shorebirds. Wintering species, including American White Pelican, Lesser Scaup, and Common Loon, had not yet returned when the surveys were conducted; they will reappear from late October through December. It is likely that they too will fail to detect any threats to lead them away from affected areas.

***Birds' fidelity to their normal habitats puts them squarely where the oil was—and, as Audubon's researchers discovered, where the oil often remains.***

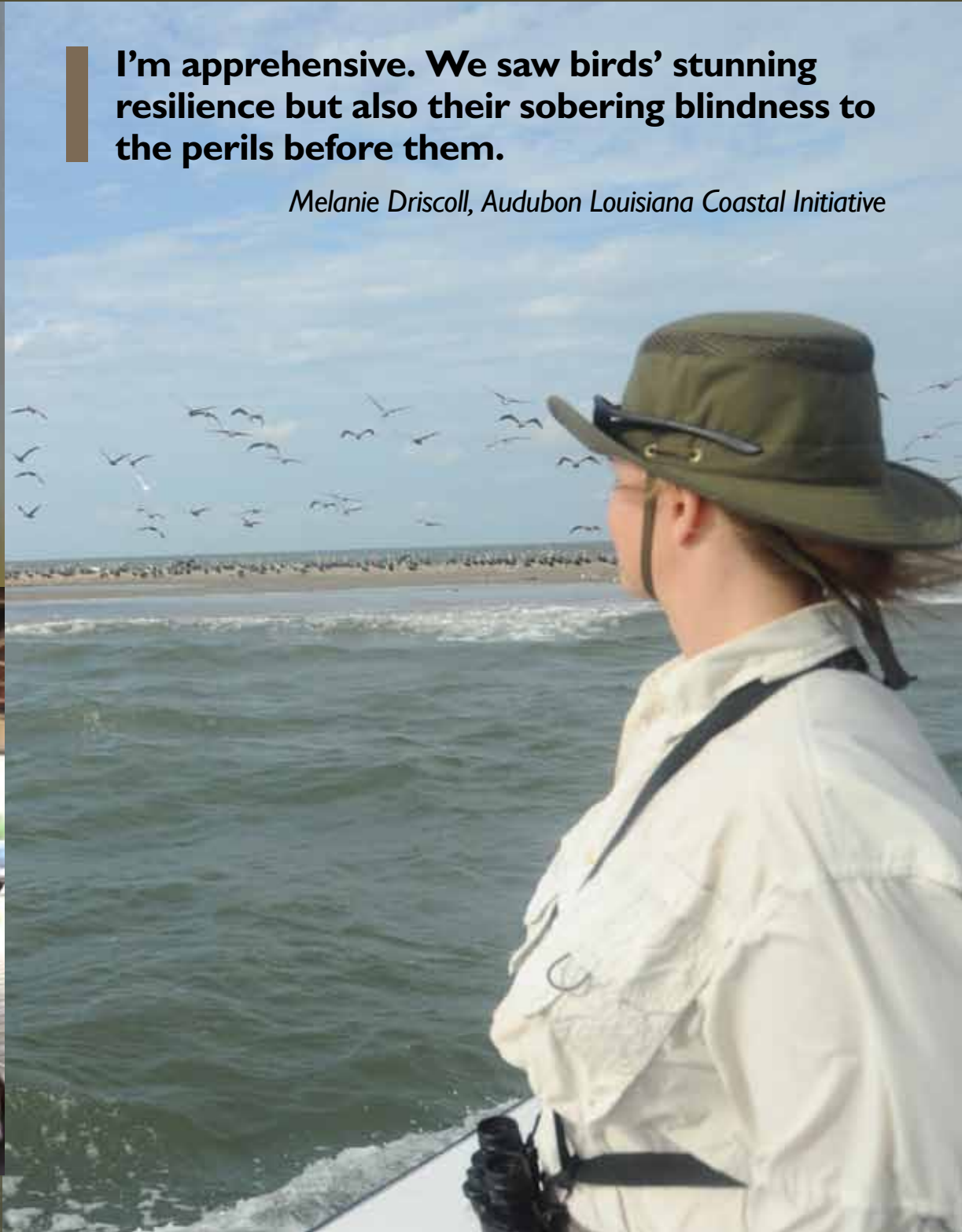


ABOVE: Tallying species counts during a survey/Kim Hubbard

OPPOSITE PAGE, MAIN PHOTO: Melanie Driscoll en route to survey site/Kim Hubbard;  
INSET, TOP TO BOTTOM: Laughing Gull, a familiar species year-round on Gulf beaches/  
Bill Stripling; Dr. Paul Kemp reviews observations/Kim Hubbard

I'm apprehensive. **We** saw birds' stunning resilience but also their sobering blindness to the perils before them.

*Melanie Driscoll, Audubon Louisiana Coastal Initiative*







## *The Oil and the Risk Remain*

Nearly six months after the Deepwater Horizon explosion, Audubon teams found cleanup operations still in progress. Media interest in oiled habitats is fading since the Macondo well was “killed.” But the oil itself is disappearing far more slowly.

Audubon researchers found oil along nine out of 10 transects in Barataria and Terrebone bays and the Isles Dernieres island chain; these globally significant Important Bird Areas provide vital habitat for sandpipers, terns, wading birds, and pelicans, including Red Knot, Piping Plover, Wilson’s Plover, Least Tern, Brown Pelican, Black

Skimmer, Clapper Rail, American Oystercatcher, and Roseate Spoonbill.

Teams observed oil in many different forms and places. In some cases it was buried beneath the sand and oozed upward in response to pressure or changing temperatures. Tarballs peppered high-tide lines on some beaches. In other locations, heavily weathered oil (described by some as “tar reefs”) on tidal flats sent a steady stream of oily materials to shore but remained underwater except at low tide. Similar tar mats have been reported and likely exist out in deeper water, where large storms





can cause further breakup and send residue onto beaches. One barrier island was extensively oiled with tar patties that had washed ashore six days before the survey. Oiled marsh edges still showed dark, oily material and dead vegetation.

Not surprisingly, there was no direct evidence of oil in the western transects, though chemical analysis of samples may reveal what the eye cannot.

Wherever oil and other chemicals persist, vulnerable species will remain unwitting subjects of an uncontrolled experiment that is far from over.



OPPOSITE PAGE, CLOCKWISE FROM TOP LEFT:  
Dr. Reid Bishop finds oil beneath the sand/Kim Hubbard; Oil lurks on tidal flats/Kim Hubbard; Tarball/Kim Hubbard Sanderlings and a Willet/Gerry Ellis; Melanie Driscoll confers with a boat captain/Kim Hubbard

THIS PAGE, CLOCKWISE FROM TOP LEFT:  
Oiled oyster shell found during survey/Kim Hubbard; Laughing Gull with prey/Kim Hubbard; Karen Westphal collects a sand sample for analysis/Gerry Ellis; Oil sullies a tidal pool/Kim Hubbard



## FINDING ANSWERS

Audubon scientists have partnered with faculty and students at the department of chemistry at Millsaps College in Jackson, Mississippi, to tackle unanswered questions that linger in Gulf Coast sands and sediments. Using gas chromatography-mass spectrometry and other analytical methods, the team is studying a variety of oily materials still present in Gulf Coast habitats to determine their composition. And using sophisticated analytical instrumentation, they will probe apparently clean samples to identify and quantify what the human eye cannot. Results of this ongoing study will help provide answers about risks to birds and their food supplies and will track the behavior of hydrocarbons in the environment over time.



# CAUSES FOR CONCERN

## Impacts on the Fragile Food Chain

Among the many threats associated with the oil—and the chemicals it contains—the most alarming and uncertain are impacts on the quality and abundance of the marine ecosystem's complex food chain. Audubon scientists, along with most other experts monitoring the disaster's aftermath, are concerned about the potential effects of oil and dispersants on this vital web, from the seafloor up through the water column to coastal ecosystems. Understanding the short-term and long-term consequences for food chains will be fundamental to effective conservation and restoration strategies. Six months into what amounts to a massive chemical experiment on the myriad organisms that play a crucial role in the food chain, scientists are keeping close watch on these key concerns.

**This fragile chain supports lives and livelihoods Gulf-wide. We cannot afford broken links.**

*Stan Senner, Director, Conservation Science, Ocean Conservancy*

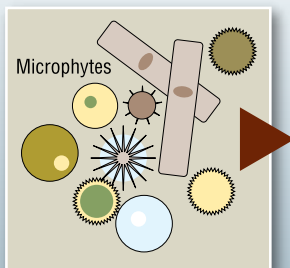
## REDUCTION OF AVAILABLE PREY

It is possible that oil has reduced the abundance of certain planktonic organisms, fish, marine or sand-dwelling invertebrates, or other key prey species, or will precipitate population declines in the future. Eggs and larvae may already be affected, but the problem could take months or years to manifest. Residual hydrocarbons in the water, on the seafloor, and in surface sand and soil—some of which will persist for decades—could continue to kill or drive away organisms in areas where birds need to feed. This could leave them without sufficient food or force them to work harder to find the nutrition they need. If these effects are sufficiently severe, birds' ability to migrate and reproduce may be compromised.

## UNKNOWN IMPACTS TO A FRAGILE FOOD CHAIN

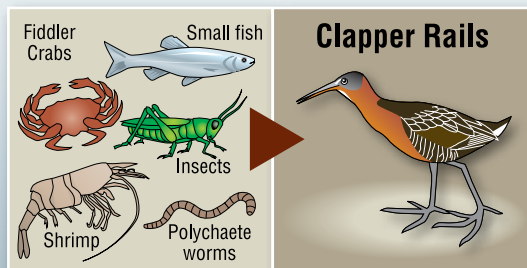
### IN THE MUD

The marsh mud is home to micro-organisms that form the food base for all life in the coastal estuary.



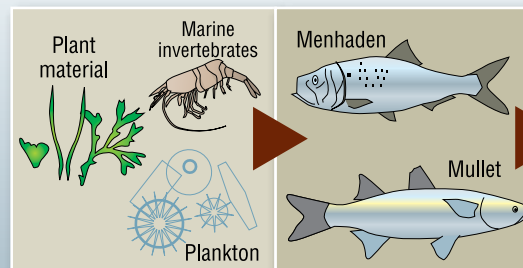
### IN THE SALT MARSH

Marsh-dwelling Clapper Rails are opportunistic omnivores that will eat scavenging crustaceans, insects, mollusks, small fish and other vertebrates, seeds, and even other birds and bird eggs.



### IN THE OPEN WATER

Brown Pelicans and Royal Terns feed on menhaden, mullet and other fish, which themselves feed on plankton, marine invertebrates and dead organic material in the water.





## BIOACCUMULATION OF TOXIC COMPOUNDS

Certain components of crude oil and dispersants, including compounds called polycyclic aromatic hydrocarbons, are known to bioaccumulate in the tissues of marine organisms like amphipods and polychaete worms.<sup>1</sup> Bioaccumulation means that toxic substances build up in an organism's body faster than they are broken down, leading to increasingly higher concentrations. The factors contributing to bioaccumulation are complex, and we do not yet know to what extent these compounds—or others—may have accumulated or will accumulate in certain Gulf organisms, or what the effects could be on larger animals like birds.

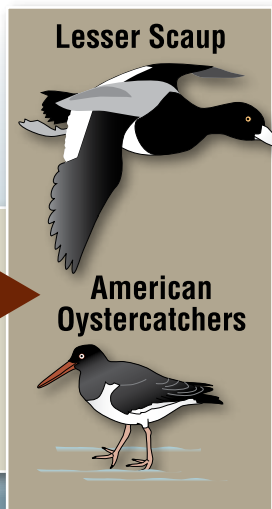
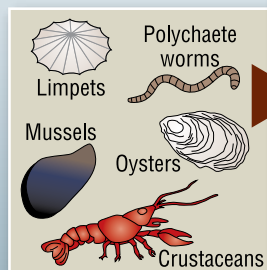


## PERSISTENT, SUBLETHAL TOXIC EFFECTS

Fifteen years after the *Exxon Valdez* spill, research showed that persistent levels of toxic chemicals, though sublethal—insufficient to cause immediate death—were affecting wildlife by altering behavior and reproductive success and decreasing survivorship.<sup>2</sup> It is reasonable to fear that birds could suffer such effects through contaminated or reduced food supplies, from ongoing exposure to toxic chemicals, or from exposure previously suffered during the height of the crisis. Any reduction in fitness, especially for birds of conservation concern, can have negative effects on bird populations both in the Gulf and across the ranges of migratory species.

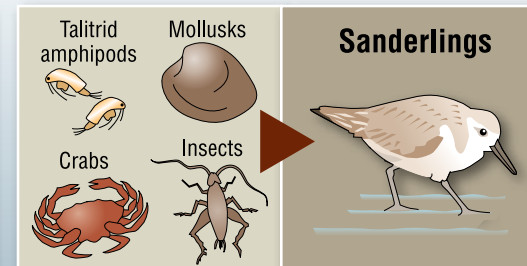
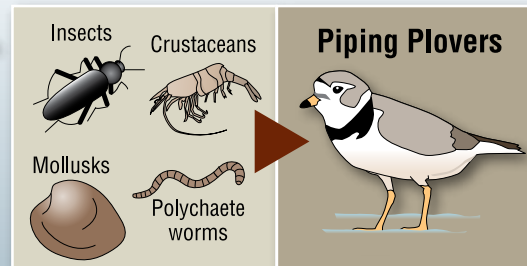
### IN THE OYSTER BEDS

American Oystercatchers and Lesser Scaup specialize on filter-feeding mollusks like oysters, clams and mussels but may also eat crustaceans, worms and other marine organisms.



### ON THE SAND FLATS

Shorebirds like Sanderlings and Piping Plovers feed on a wide range of invertebrates on or in the sand and wrack, including isopods, amphipods and polychaete worms, which consume microorganisms, tiny invertebrates and decaying organic matter.



### IN THE AIR



Peregrine Falcons hunt shorebirds, waterfowl and other birds along the Gulf Coast. High on the food chain (like Brown Pelicans), Peregrine Falcons suffered heavily from bioaccumulation of DDT in the last century.

## Habitat Disturbance from Cleanup Activities

Audubon science teams confirmed the presence of threats beyond oil and chemical residues. Surveyed beaches showed evidence of potentially detrimental cleanup efforts and protective measures. At eastern sites where crews were collecting tarballs and removing oil deposits, the work was memorialized by multiple tracks from off-road vehicles and by piles of sand discarded after cleaning efforts. These ghostly reminders will disappear quickly. Regrettably, intense activity involving heavy equipment can leave a more serious and lasting legacy of increased erosion—exactly the wrong prescription for areas where habitat is washing away at alarming rates. Debris such as protective boom was still present in these sites, in some cases partially buried in the sand. Western sites revealed a much

lower level of disturbance. However, basket-like structures erected along beaches to protect inland marshes from oiling have altered habitat and feeding opportunities for some bird species.

Among the most disruptive effects of cleaning efforts is the elimination of “wrack” from beaches. Wrack is formed when dead vegetation and algae wash ashore, creating a wrack line that is an important feeding zone for many shorebirds while also providing

cover from the elements and from predators. On eastern beaches where wrack was cleared away by cleaning efforts, only one beach had accumulated a small amount of new material. Audubon teams evaluated the density of wrack on surveyed beaches using a scale of 0–3. On the western beaches where little or no oil washed ashore, wrack density averaged 1.62. But it was nearly absent on cleaned eastern sites, averaging just 0.1—the level clearly indicates diminished habitat quality.



RIGHT, TOP TO BOTTOM: Cleaned-up habitat marred by tire tracks/Tom Bancroft; Undisturbed wrack shelters Snowy Plover and Sanderling/Gerry Ellis

OPPOSITE PAGE, MAIN PHOTO: Cleaned beach stripped of wrack/Kim Hubbard; FAR RIGHT, TOP TO BOTTOM: Sorbent boom remains on beach/Tom Bancroft; Cleanup crew and equipment on beach/Tom Bancroft



**We saw vivid reminders of how little is known about coping with this kind of disaster. It's tough to tell whether some responses are doing more harm than good.**

*Thomas Bancroft, Ph.D., Audubon Chief Scientist*



# BP OIL DISASTER: ONE OF MANY THREATS

The beaches, islands, wetlands, and waters of the Gulf of Mexico play an essential role in the life cycles of hundreds of North America's bird species, some of which breed and remain in the region year-round. Others, like the Semipalmated Sandpiper, pause to rest and refuel at this "Grand Central Station" on the Mississippi Flyway, en route between their Arctic breeding grounds and wintering sites farther south. And for still others, like the Piping Plover and the American White Pelican, the Gulf is the ultimate destination of fall migration and a place to spend the winter. The long-term impacts of the BP disaster on each of these groups will be determined by the different ways they depend on the Gulf.

Risks associated with this summer's crisis are only the latest in a series of ongoing insults to Gulf ecosystems already in severe decline. Many species are already experiencing population decreases due in large part to a broad array of environmental ills: Louisiana loses an alarming 25 square miles of coastal habitat each year, largely as a result of shortsighted management of the Mississippi River and the loss of sediments needed to replenish the state's rapidly eroding coast. Beach nesting sites are frequently disturbed as a result of overdevelopment. These pressures are compounded by the escalating threats from global climate change; its projected toll includes the gradual loss of coastal island and marsh habitat to rising seas.

In essence, the birds of the Gulf are indicators of its broader ecological health—as well as the health of other habitats on which they depend. There are no quick fixes for the problems that face this vital region. And dealing with the oil disaster alone is not enough. Protecting the future of Gulf birds, other wildlife, and human communities requires long-term efforts that address a wide range of challenges and that ultimately restore the health of the coast's imperiled ecosystems.



RIGHT, TOP TO BOTTOM: Brown Pelicans perch on oil boom/Gerry Ellis; Oil clean-up crews on beach in Florida/Gerry Ellis

OPPOSITE PAGE, MAIN PHOTO: Hastily constructed sand berms may have done more harm than good/Gerry Ellis; INSET, TOP TO BOTTOM: Barrier island erosion on the Louisiana coast (top two photos)/Kim Hubbard; MRGO, and other poorly planned shipping channels hasten erosion/Gerry Ellis; Invasive Water Hyacinth can choke waterways and eliminate native plants/Gerry Ellis



**The oil disaster is but the latest insult to an injured landscape still rich in resources and history. We can and must restore the Gulf.**

*Chris Canfield, Audubon VP for Gulf Coast Conservation*



## The Brown Pelican

Five months before the BP oil disaster started, the Brown Pelican was removed from the U.S. endangered species list thanks to years of effective conservation measures. The banning of DDT, repatriating pelicans to Louisiana, and years of special stewardship efforts all contributed to the species' recovery from near extinction. Throughout the summer of 2010, repeated images of oiled and dying pelicans made the state

bird of Louisiana familiar to many as a symbol of oil's deadly impact. The U.S. Fish and Wildlife Service reports that hundreds of dead Brown Pelicans have been collected in the Gulf, making it second only to the Laughing Gull in confirmed spill-related deaths. Experience from previous spills makes it clear that the recovered birds represent only a fraction of the total that perished.

As Audubon's survey revealed, pelicans are not yet safe from the

effects of the oil and the cleanup. Direct contact and disturbance, food-chain issues, and long-term toxicity all remain serious threats. The oil disaster struck sensitive nesting areas at the beginning of the pelican's breeding season. Though Audubon's survey showed that birds successfully fledged from nests in oiled areas, their long-term prognosis is uncertain. Many young in Gulf colonies were exposed to oil when their parents came back to feed them or when the juveniles first left the colony to begin feeding on their own. Only population monitoring will provide clues about the extent of impacts on the young and on breeding populations. Pelicans' relatively lengthy maturation process means that the true toll of the spill on reproductive success and population stability will not be revealed for several years.



FROM LEFT: Brown Pelican, removed from the endangered species list in 2009/*Bill Stripling*; A young Brown Pelican stretches its wings/*Kim Hubbard*; Pelican in flight/*Kim Hubbard*; Pelican flock over Gulf beach/*Kim Hubbard*





## Oil-related Threats

- Chemicals persisting from oil or dispersants may reduce the availability or health of prey such as mullet and other fish.
- Residual oil in the water or on beaches that might still coat feathers, putting the birds at risk of fatalities from hypothermia or ingestion of oil.
- Unknown effects of oil on the behavior or reproductive success of birds.

CLOCKWISE FROM TOP RIGHT: Overfishing can reduce available prey for ocean-feeding birds/Gerry Ellis; Dredging to keep Mississippi River navigation channels open contributes to disappearing wetlands at the river's mouth/Bruce Reid; Oil on Louisiana beach during spill/Kim Hubbard; Oiled island in Barataria Bay with oil platform in background/Gerry Ellis; Pelicans at rookery/Gerry Ellis



Even without the effects of the BP disaster, Brown Pelicans face an uphill battle against the declining health of their Gulf habitat. The oil merely exacerbated the combined dangers from:

## Ongoing Threats

- Loss of nesting islands from lack of sediment, the result of shortsighted management of the Mississippi River.
- Loss of nesting islands due to climate-change-related sea-level rise.
- Loss of nests and habitat islands from severe storms.
- Development and other human disturbance of beach and island habitat.
- Decreases in food supply due to declining Gulf water quality.
- Decreases in food supply from overfishing.



## Gulf Breeding Species

Each species on this page depends on healthy Gulf habitat for reproductive success and population stability. All are either recognized as species of conservation concern by the U.S. Fish and Wildlife Service, or included on Audubon's WatchList. Like the Brown Pelican, they face a combination of threats from the BP disaster and from the declining state of Gulf ecosystems. Twelve of the 13 major threats affect all of these species.

### PHOTOS:

Oiled Louisiana marsh during spill/  
*Kim Hubbard;*

Mottled Duck/*Bill Stripling;*

Brown Pelican/*Gerry Ellis;*

Least Tern/*Steve Maslowski, USFWS;*

Black Skimmers/*Bill Stripling;*

Roseate Spoonbill/*Bill Stripling;*





American Oystercatcher/*Bill Stripling;*

Reddish Egret/*Rebecca Field;*

Clapper Rail/*Gerry Ellis;*

Seaside Sparrow /*Gerry Ellis;*

Wilson's Plover/*Bill Stripling*

				
↓ Threats / Gulf Breeding Species →		Mottled Duck	Brown Pelican	Least Tern
OIL-SPILL-RELATED THREATS	Threats from direct contact with oil	x	x	x
	Loss or contamination of food (oil or dispersants)	x	x	x
	Contamination of nesting habitat	x	x	x
	Bird and habitat disturbance during cleanup	x	x	x
ONGOING THREATS	Sea-level rise	x	x	x
	Severe storms (habitat loss)	x	x	x
	River mismanagement (habitat loss)	x	x	x
	Inappropriate coastal development	x	x	x
	Inappropriate shoreline management	x	x	x
	Inappropriate fishing, shrimping, or oystering		x	
	Non-native invasive species	x	x	x
	Recreational bird and habitat disturbance	x	x	x
	Inappropriate energy development	x	x	x




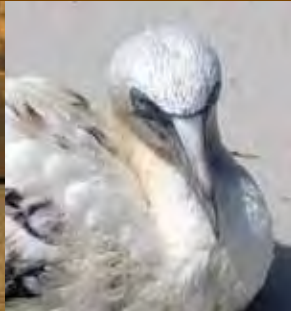


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## Winter Resident Species








The species listed on this page depend on healthy Gulf habitat for their winter food and survival, and thus are vulnerable to all of the threats facing the Gulf. Because they breed in other more northerly locations, they may face a variety of threats on their nesting grounds as well. Those that feed offshore in open water, including Northern Gannets and Common Loons, are also at risk from diminished food availability as a result of inappropriate fishing and shrimping.

### PHOTOS:

Sunset over wetlands in Cameron Prairie National Wildlife Refuge/*Gerry Ellis*;  
Northern Gannet/*USFWS*;  
Common Loon *Steve Maslowski, USFWS*;  
American White Pelican/*Bill Stripling*;  
Piping Plover/*Gene Nieminen, USFWS*;  
Lesser Scaup/*Dave Menke, USFWS*;  
Blue-winged Teal/*Dave Menke, USFWS*;  
Red Knot/*Greg Breese, USFWS*;  
Sanderling/*Bill Stripling*;  
Peregrine Falcon/*Bill Stripling*;  
Northern Harrier/*Bill Stripling*

				
↓ Threats / Winter Resident Species →		Northern Gannet	Common Loon	American White Pelican
OIL-SPILL-RELATED THREATS	Threats from direct contact with oil	x	x	x
	Loss or contamination of food (oil or dispersants)	x	x	x
	Contamination of nesting habitat			
	Bird and habitat disturbance during cleanup		x	x
ONGOING THREATS	Sea-level rise (habitat loss)		x	x
	Severe storms		x	x
	River mismanagement (habitat loss)	x	x	x
	Inappropriate coastal development		x	x
	Inappropriate shoreline management		x	x
	Inappropriate fishing, shrimping, or oystering	x	x	x
	Non-native invasive species	x	x	x
	Habitat disturbance from recreation	x	x	x
	Inappropriate energy development	x	x	x



						
Piping Plover	Lesser Scaup	Blue-winged Teal	Red Knot	Sanderling	Peregrine Falcon	Northern Harrier
x	x	x	x	x	x	x
x	x	x	x	x	x	x
x	x	x	x	x	x	x
x	x	x	x	x	x	x
x	x	x	x	x	x	x
x	x	x	x	x	x	x
x	x	x	x	x	x	x
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x	x	x	x	x	x	x
x	x	x	x	x	x	x
x	x	x	x	x	x	x

# AUDUBON ACTION

True to its storied history, Audubon's response to the Gulf crisis began with efforts to save birds directly threatened by the oil and its damage to sensitive habitats. The emergency response represents a continuation of a decades-long commitment to restoring the health of Gulf ecosystems. The following stories of immediate and follow-up response—along with Audubon's recommendations—highlight how the mass engagement of Audubon's grassroots conservationists is playing a critical role in setting Gulf Coast birds, ecosystems, and communities on a course toward renewal.

## EMERGENCY RESPONSE

In the first days of the BP oil disaster a new army of Audubon volunteers rose and joined established Audubon chapters and conservationists to support an unprecedented emergency response. Along the Louisiana coast, dedicated dock watchers and runners volunteered thousands of hours at the water's edge and drove great distances to aid the transport of oiled and injured birds. When official crews called, volunteers were there at a moment's notice—keeping injured birds safe, logging vital evidence, and providing support that made them essential links in the bird rescue and rehabilitation chain.

Audubon volunteers crafted capture nets, built cages for oiled birds, and monitored and fed young rehabilitated birds rescued

during the disaster. In Florida and elsewhere, volunteers helped identify sensitive nesting areas to minimize damage during cleanup efforts. Audubon's Volunteer Response Center in Moss Point, Mississippi, rapidly became a critical hub for volunteer action, filling evolving manpower needs across the Gulf Coast.

## CITIZEN SCIENCE

Long-term monitoring of birds and habitat forms the backbone of recommendations for understanding the impact of the disaster and for nursing the region back to ecological health. Audubon citizen science efforts are already playing vital roles.

Audubon's Coastal Bird Survey—developed in coordination with researchers at Louisiana State University and the Cornell Lab of

Ornithology—dispatched observers just weeks into the disaster to provide an essential window on the spill's impacts. Surveyors ranging from experienced mentors to eager newcomers began gathering data on birds and their condition, and will continue throughout the year to help assess how birds and ecosystems are responding to the spill. Audubon is also partnering with the U.S. Fish and Wildlife Service to monitor bird populations at National Wildlife Refuges that are participating in a federal initiative to divert migratory shorebirds and waterfowl from oiled habitats by attracting them to freshly watered areas. The monitoring will allow evaluation of this important conservation strategy.

Longer-term insights will be provided by Audubon's citizen science efforts that have engaged birders and wildlife watchers in some of the continent's most important bird population monitoring initiatives. Now in its 111th season, the Audubon Christmas Bird Count will generate tens of thousands of systematic observations to give scientists

initial and ongoing looks at possible oil-related changes in species populations and location. The data will provide important indications of whether imperiled species like the Brown Pelican are now at greater risk or continue to rebound in spite of the disaster. Findings will reflect variables ranging from the oil disaster itself to severe weather and the longstanding decline of coastal habitats. They will paint a much-needed picture of both how species are faring and of broader ecological health.

## ADVOCACY

Audubon is marshaling the strength of tens of thousands of Gulf volunteers and other grassroots activists to urge elected officials and government agencies to hold polluters like BP accountable, to create and enforce strong protection mechanisms for birds and habitats, to invest in renewing battered Gulf Coast ecosystems, and to choose a cleaner, healthier, safer future for us all.



## HANDS-ON CONSERVATION

Species affected by the oil disaster will benefit from the work of Audubon volunteers across the Gulf Coast and throughout the United States to restore and improve habitat at Important Bird Areas and other critical sites. Ongoing efforts, from planting grasses, wildflowers, or trees to eliminating invasive species and removing trash from local waterways, will help millions of birds, both on the Gulf Coast and in other vital habitats across their migratory routes.

Audubon will be focusing volunteer efforts on special stewardship of Important Bird Areas in the Gulf region.

## EDUCATION

Audubon's volunteer educators play a key role in connecting people of all ages to the wonders of nature and their own power to protect it. In the wake of the Gulf oil disaster, educators and communicators will help concerned people understand their connection to the birds of the Gulf and to conservation actions that can shape a healthier environment for birds, wildlife, and people everywhere.



RIGHT: Volunteer feeding rescued and rehabilitated Brown Pelicans

ABOVE, TOP TO BOTTOM: Volunteers assist in transporting oiled birds; Coastal Bird Survey volunteers provide vital data; Audubon's Volunteer Response Center

All photos Kim Hubbard







# RECOMMENDATIONS

The continued well-being of the birds, wildlife and people of the Gulf depends on addressing the immediate impacts of the disaster and on taking action to restore the long-term health of an ecosystem suffering from a host of ills. Audubon is in it for the long term, and we are committed to addressing both sets of challenges. We recommend:

## MITIGATE THE SPILL'S IMPACTS

The continued presence of oil and disaster-related debris in many Important Bird Areas makes it clear that BP must continue cleaning up as much oil as possible—and do so in ways that minimize harm to birds, other organisms, and their habitats.

- Continue cleanup of beaches as residual oil comes ashore or is discovered.
- Avoid damaging fragile marshes and beaches with aggressive cleanup techniques.
- Minimize disturbance to birds and wildlife from cleanup crews.
- Remove stray boom, bags of soiled material, and other debris from the environment.
- Remove wire baskets from beaches and reverse other temporary protection measures that diminish habitat health.

## MONITOR AND ACT

Unanswered questions about oil's long-term effects on birds and the food chains

that sustain them mean that scientists, government agencies, and conservation groups must remain vigilant, carefully monitoring populations and responding quickly to any emerging threats or declines observed in the months and years ahead.

- Determine how much oil remains underwater to gain better understanding of how it might continue coming into contact with organisms and being dispersed through the ecosystem.
- Monitor ecosystem health, including wildlife populations.
- Research long-term effects and toxicity of oil and dispersants. Conservation and restoration strategies depend on understanding whether there are or will be lingering effects from chronic exposure to toxins in the environment.

UPPER RIGHT: Dawn in Audubon's Paul J. Rainey Wildlife Sanctuary, part of an IBA/Gerry Ellis

RIGHT: Dr. Tom Bancroft surveys flock of gulls/Gerry Ellis



## SYSTEM-WIDE CONSERVATION

BP's oil and its associated threats just add to the many perils facing birds, ecosystems, and people along the Gulf coast. Much more must be done to set the region on a course to improved health:

- Provide the dedicated funding needed to ensure full restoration of Gulf Coast ecosystems.
- Reconnect the Mississippi River to its delta in Louisiana. This hugely important Gulf Coast ecosystem is disintegrating at the rate of 25 square miles per year. River flows must be reestablished to begin countering this catastrophic collapse.
- Create new habitat and build up existing islands by using dredged sediment from major navigable waterways. Manmade islands can become important nesting areas for birds like the Brown Pelican, providing artificial habitat to help counteract the loss of natural breeding areas.
- Reduce pollution and excess nutrients entering coastal habitats and the Gulf of Mexico through major river systems and developed areas.
- Minimize human disturbance of vulnerable beach-nesting birds like Least Tern, Wilson's Plover, and Snowy Plover, particularly in Important Bird Areas.
- Protect critical bird nesting and feeding areas—especially designated Important Bird Areas—from development and alteration.
- Ensure that all energy projects—whether fossil fuel extraction or renewable energy development—are conducted in conformity with the strictest environmental safeguards and review, having the courage to recognize that some areas should be protected from all forms of development forever.
- Cut greenhouse gas emissions to reduce the amount of sea-level rise.
- Control non-native invasive species that harm Gulf Coast habitats and wildlife.
- Manage fisheries carefully, according to the best available science, to avoid overexploitation, population collapse, habitat destruction, or by-catch of birds or turtles.

THIS PAGE, TOP TO BOTTOM: Ruddy Turnstone/  
*Tom Bancroft*; Bruce Reid (L) and Karen Westphal  
(R) collect beach sand sample, east of Holly  
Beach/*Gerry Ellis*

OPPOSITE PAGE, MAIN PHOTO: Breeding colony  
of Brown Pelicans, Louisiana's state bird/  
*David J. Ringer*

Recent polls reveal widespread public support for dealing with the aftermath of the BP disaster and for restoring the broader health of Gulf ecosystems. This will take the active engagement of caring people everywhere. Together, we can turn a disaster into hope for one of the world's most beautiful and productive regions.









# METHODOLOGY

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To gain an understanding of the effects of the oil spill on bird populations and the environment, Audubon science teams designed a survey to assess conditions at a series of sites across southern Louisiana. Survey sites were chosen to represent both habitat areas that received oil during the BP spill (10 such sites were included) and those where little or no oil came ashore (13 such sites were included). Teams also surveyed 10 marsh habitats, one of which had visible evidence of oil. They collected data on three characteristics at each site: bird numbers, species, and observable condition; the visible presence or other evidence of oil in beach sand; and habitat disruption from oil clean-up activities.

Teams surveyed the birds by undertaking one-kilometer transects along beach habitat and 15-minute stationary counts at marsh habitats. Walking slowly along each transect, survey teams recorded total numbers of birds of all species seen on either side of the transect lines. All birds were also observed for evidence of oil on their feathers, whether on the beach or flying by. Teams were able to confidently make this determination for about half the individual birds. Marsh surveys were conducted from a single point. Team

members listened for species songs or calls for five minutes; they then listened for five more minutes following the playing of a Clapper Rail call, plus 5 additional minutes following the playing of a Seaside Sparrow song. During both beach and marsh surveys they watched birds for abnormal behavior that might suggest exposure to toxins.

Teams also collected information on habitat on the transects and marsh surveys. For beach sites, this included information on the wrack—vegetation that washes up on shore during high tides—which provides extremely important feeding areas for many shorebirds and was often cleaned up during the response to the oil spill. They scored wrack on a 0 to 3 scale, in which 0 was “no wrack present” and 3 was “contiguous cover of wrack along the beach.” They also recorded the presence of oil, tarballs, and other evidence of oil along the beach using a relative scoring system from 0 (no evidence of oil) to 3 (contiguous coverage). Additionally, team members assessed impacts from human activity, either from cleanup crews or from recreational use. As part of this effort they recorded both direct human use along the beach and evidence of use such as tire tracks, presence of booms,

cleanup stations, and piles of trash and sand from cleanup.

To look for evidence of oil and dispersants in sand, teams collected sand samples from the surface and from within trenches. At select locations they dug a six-foot-long trench parallel to the beach and one foot deep. After checking for evidence of layering of oil in the sand, teams took sand samples from within the trench for testing. These samples will be analyzed in the lab for hydrocarbons from oil and for remnants of dispersants. Sampling and chemical analysis will reveal oil not present on the surface but still present in the sand. This hidden oil has the potential to affect prey availability and quality.

Audubon will use all information gathered to form the baseline for ongoing study and increased understanding of disaster impacts and implications, as well as how they relate to other challenges facing Gulf ecosystems. Understanding these problems is a critical step in creating effective solutions.

**RIGHT:** Dr. Tom Bancroft, Audubon Chief Scientist, and David J. Ringer carrying out field survey/Kim Hubbard





## Endnotes

<sup>1</sup>Meador, J. P., E. Casillas, C. A. Sloan, and U. Varanasi. 1995. Comparative bioaccumulation of polycyclic aromatic hydrocarbons from sediment by two infaunal invertebrates. *Marine Ecology Progress Series* 123: 107–124.

<sup>2</sup>Peterson, C. H., S. D. Rice, J. W. Short, D. Esler, J. L. Bodkin, B. E. Ballachey, and D. B. Irons. 2003. Long-term Ecosystem Response to the Exxon Valdez Oil Spill. *Science* 302: 2082–2086.

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RIGHT: Reddish Egret on Louisiana beach/  
*Tom Bancroft*

FRONT COVER: Sanderling/*Kim Hubbard*

BACK COVER: Oil slick in Gulf of Mexico  
around the Mississippi River Delta and nearby  
Louisiana coast/*NASA*





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