

# 10 SPECIES 10 YEARS LATER

A Look at Gulf Restoration  
after the Deepwater  
Horizon Disaster



APRIL 2020

## 10 Years After the Deepwater Horizon Oil Spill

On April 20, 2010, the Deepwater Horizon oil rig exploded, killing 11 men and unleashing a torrent of oil and natural gas from BP's Macondo wellhead into the Gulf of Mexico. By the time the well was capped 87 days later, an estimated 200 million gallons of crude oil and four million pounds of gas had escaped into the Gulf.

A decade later, the impacts of this disaster are still being felt in the Gulf. Serious, ongoing harm to many wildlife and habitats has been documented — with some species now at greater risk of extinction than before.

The official assessment of the ecological damage from the oil spill — the *Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement* — describes the disaster as **“an ecosystem-level injury to the northern Gulf of Mexico.”** This document, published in 2016, remains the most comprehensive summary of impacts to wildlife and their habitats, as it was based on hundreds of original studies.

The official estimates of harm were based on the best science available at the time, but new information is still coming to light. For example, a University of Miami study published in 2019 found that the footprint of the oil was actually 30 percent larger than previously thought — and that toxic concentrations of oil reached places, such as the Upper Texas Coast and the West Florida Shelf, not previously understood to have been affected.

This report, *10 Species, 10 Years Later*, summarizes the best information available about the wildlife featured. We selected these species for many reasons: They represent different types of affected wildlife, they use a diversity of ecosystems and they offer an opportunity to discuss the wide scope of restoration efforts that are now underway. The research and restoration efforts described in this report were largely funded out of the criminal and civil penalties paid by BP and the other companies responsible for the oil spill. In total, these penalties have made more than \$16 billion available for restoring the Gulf of Mexico — an ongoing effort that will ultimately be the largest, most comprehensive ecosystem restoration effort in our nation's history.

COVER PHOTO: ISTOCK; BELOW: KAILA DRAYTON





01

# Kemp's Ridley Sea Turtle



**THE KEMP'S RIDLEY** is the smallest sea turtle in the world and it nests exclusively on Gulf beaches, largely in one area of Mexico. In the 1960s, the Kemp's ridley was considered at risk of imminent extinction due to the uncontrolled harvest of eggs and accidental deaths in shrimp trawls in both Mexican and American waters. A collaborative, bi-national conservation effort focused on protecting eggs on nesting beaches and the use of turtle excluder devices on shrimp trawlers, resulted in a significant rebound — with the number of nests increasing an average of 19 percent annually through 2009.

Sadly, the steady nesting increases ended in 2010, the year the Deepwater Horizon exploded. The damage assessment estimated the oil killed as many as 20 percent of the female Kemp's ridley turtles that nest annually. One small study found that over half the Kemp's ridley turtles tested from 2010 to 2012 had signs of oil exposure. Nesting in the years after the spill has fluctuated significantly. Some scientists are speculating that that long-standing problems in the Gulf, such as a reduction in food sources, could also be a factor.

## 10 YEARS LATER

### Multifaceted, bi-national recovery efforts

Deepwater Horizon funds are being used for a multi-faceted, multi-partner effort to help Kemp's ridley sea turtles. Funds are being used to monitor nesting beaches in Texas and Mexico and to protect a 4,800-acre nesting beach in Texas from development. This project has also enhanced the sea turtle stranding network, giving organizations additional capacity to find and assist injured or cold-stunned sea turtles. Another aspect of the project increases the use of turtle-excluder devices on shrimp trawls in Texas and federal waters. In addition, other Deepwater-Horizon-funded projects aimed at restoring marshes, rebuilding oyster reefs, and protecting important coastal habitats could boost populations of blue crabs and other food sources for the Kemp's ridley.





02

# Coastal Bottlenose Dolphin

**THE DEEPWATER HORIZON DISASTER** was the most significant factor behind the largest and longest lasting recorded dolphin die-off in the Gulf of Mexico. Between 2010 and 2014, more than 1,000 dolphin carcasses were found in the oiled areas of the northern Gulf. Research done in 2018 found that many dolphins in oiled areas remained very ill — 55 percent had worsening lung disease; 43 percent exhibited abnormal stress responses, 25 percent were underweight, and 19 percent were anemic. Successful births in the heavily oiled areas remain less than a quarter of normal levels. Dolphins born after 2010 are not as sick as those that were exposed directly to oil, but they are not as healthy as dolphins born in unoiled areas. Scientists estimate it could take affected dolphins populations decades to recover.

## 10 YEARS LATER

### A long road to recovery

Restoration efforts have greatly increased state and local capacity to find stranded marine mammals and to rehabilitate sick and injured dolphins. Other

funds are exploring ways to reduce collisions with boats and to lessen the noise from shipping and oil and gas activities.

Much of the oil came ashore near the Mississippi River Delta, home to a large population of bottlenose dolphins, which feed on the delta's abundant fish and shellfish. However, the wetlands and marshes that underpin the delta's ecosystem are eroding rapidly. In total, 2,000 square miles have been lost over the last 90 years, a process that was sped up by the oil. If the collapse of coastal marshes continues at its current pace, the entire ecologically-rich Mississippi River Delta system could be gone within decades. Restoration of these marshes at sufficient scale can only be accomplished by harnessing the river's natural capacity to build new delta marshes through diverting water and sediment. There are concerns about how diversion projects could impact already-stressed dolphin populations. Federal and state restoration planners are working to find the most effective ways to minimize and mitigate any impacts to dolphins while restoring the delta ecosystem as a whole.



03

# Laughing Gull

**THE HIGH-PITCHED CRY** of laughing gulls is as much a part of the soundscape of Gulf Coast beaches as the sound of crashing waves. Laughing gulls breed in barrier island colonies, often by the thousands, building their nests on the ground, where the hatchlings spend a month or more before taking their first flight. This nesting behavior meant many laughing gulls were exposed to oil as it came to shore. One study estimated that 32 percent of the laughing gulls in the northern Gulf died as a result of the spill. The National Audubon Society's annual Christmas Bird Count event found roughly 60 percent reductions in laughing gull numbers from 2010 through 2013. Laughing gulls that did survive likely experienced sub-lethal impacts to their health. The damage assessment noted that the loss of birds as a result of the Deepwater Horizon oil disaster was so large the Trustees expected there would be "meaningful effects on food webs of the northern Gulf of Mexico." In fact, one analysis of menhaden fish found that the loss of predators, including laughing gulls, could explain the unexpected increase in the populations of juvenile menhaden in 2010.

## 10 YEARS LATER

### Louisiana outer coast barrier island restoration

The beaches, dunes and back-barrier marshes of Louisiana's barrier islands were heavily oiled during the spill. To address the damages to barrier island habitat and injuries to laughing gulls and other birds that use the islands, the state of Louisiana and the federal government are restoring four barrier islands — Caillou Lake Headlands, Shell Island, Chenier Ronquille, and North Breton. Restoration of the first three islands has been completed, restoring 1,700 acres of beach habitat and nearly 300 acres of tidal wetland habitat. The fourth island — North Breton Island — will create another 200 acres of habitat, including beaches, dunes, and back-barrier marsh. Collectively, these projects will enhance nesting of laughing gulls and other species impacted by the spill, such as brown pelicans, terns, and skimmers.





04

# Deepwater Coral

**CORAL REEFS** play an important role in supporting life in the depths of the Gulf. Yet much remains to be learned about these systems, how they function, and how widespread they are in the Gulf.

Deepwater corals in several sites were harmed by the oil spill, and some of the affected sites contained colonies more than 600 years old, living in darkness up to 10,000 feet below the surface. A long-term study of more than 300 coral colonies at three oiled locations found that the recovery after 2011 was slow and that the most injured coral colonies were not likely to recover. Scientists also found dead and injured shallower water (mesophotic) corals in two locations, with damaged corals found as far as 68 miles from the wellhead. Most of the injured coral colonies in these areas continued to decline between 2011 and 2014, suggesting that they were unlikely to recover. The damage assessment also noted significant reductions of fish species associated with coral reefs.

Given the large area affected by the spill and how little is known about the bottom of the Gulf,

scientists believe that it is likely that additional oiled coral communities have not yet been discovered.

## 10 YEARS LATER

### Additional research, protections needed

At this time, there is little that scientists can do to recover or restore oil-damaged deep-sea corals. Federal scientists are studying ways to apply techniques used to restore shallow-water corals to the deep sea species, but the feasibility of these efforts is not yet known. For now, the best that can be done for deep sea reefs harmed by the Deepwater Horizon is to protect these corals from further harm. Efforts are underway to better map the abundance and distribution of deepwater coral communities so they can be better studied and protected. Expanding existing sanctuaries such as Flower Garden Banks National Marine Sanctuary, and adding deep water locations to the marine sanctuary system could help.



05

# Bryde's Whale



**LITTLE IS KNOWN** about the tiny population of Bryde's whales in the northern Gulf of Mexico. Bryde's whales are the only baleen whale known to reside in the Gulf and recent studies indicate they are genetically distinct from Bryde's whales found elsewhere. The National Oceanic and Atmospheric Administration estimates there are just 33 individuals remaining, a critically small number that alone places the population at risk of extinction in the Gulf. The official damage assessment estimated that 17 percent of the already small population died as a result of the Deepwater Horizon, noting that Bryde's whales was the most affected offshore marine mammal. The damage assessment also predicted that Bryde's whales would likely see ongoing reproductive failures as a result of the oil exposure. The disaster put the Bryde's whales in the Gulf at an even greater risk of extinction.

## 10 YEARS LATER

### Bryde's whales listed as Endangered

In 2019, NOAA listed the Gulf of Mexico population as endangered under the Endangered Species Act. This designation provides federal agencies more tools to protect the species by reducing boat strikes, finding ways to limit entanglement in fishing gear, addressing ocean noise by human activities, and minimizing noise and pollution risks from oil and gas activities. Deepwater Horizon penalties are funding research into ways to reduce the number of Bryde's whale deaths from collisions with shipping vessels and to reduce the impacts of human-caused noise on Bryde's whales in the Gulf.



06

# Eastern Oyster

**OYSTERS AND THE REEFS** they form are essential to the Gulf coast's ecosystem. One adult oyster can filter up to 50 gallons of water a day and the reefs provide important habitat for fish, crabs, birds, and other species. Oyster reefs also protect shorelines from storm surge and daily erosion. However, oyster populations have been on the decline in the Gulf of Mexico for decades due to overharvesting and man-made changes to the coast and the rivers that feed it. As many as 8.3 billion oysters were lost in the aftermath of the oil spill. According to the damage assessment, this significant loss "imperils the sustainability of oysters in the Northern Gulf of Mexico."

## 10 YEARS LATER

### Oyster restoration projects underway Gulf-wide

To help oyster populations recover, restoration efforts are underway in every Gulf state. Many of the projects aim to re-establish oyster reefs in places where they were once found. For example, in Texas's Galveston Bay, sediment from Hurricane Ike's storm surge smothered approximately half of the reefs in the bay, devastating oyster production and harming the local seafood industry. Deepwater Horizon funds are currently restoring or rebuilding oyster reefs in several areas of Galveston Bay, which should also help protect vulnerable communities from future storms. The hope is that the restored oyster reefs will boost other fish and wildlife populations in these systems as well.





07

# Common Loon



**MANY COMMON LOONS** that nest in the northern United States and Canada spend their winters along the Gulf Coast. Even though most of the “snowbird loons” were not physically present in the Gulf during the summer of 2010, as many as 800 loons are estimated to have died due to exposure from the oil in the summers after the spill. The oil’s impacts were long lasting: studies found oil compounds remained detectable in some individual loons’ blood, fat, feathers and eggs years after the disaster. These levels were high enough to cause harm, such as diminished health and reproductive fitness.

## 10 YEARS LATER

### Restoring loon habitat

Scientists have determined the most effective way to help loons recover is to improve their breeding, nesting, and resting habitats in the Upper Midwest, particularly Minnesota, which has the largest population of loons in the continental United States. Restoration activities are focused on Minnesota lakes: acquiring land and protecting lakeshore habitats where loons breed and nest, providing nesting platforms, and reducing loon exposure to lead-based fishing tackle.



08

# Gulf Sturgeon



PHOTO: RYAN HAGERTY - USEFWS

**GULF STURGEONS** are a sort of “living fossil,” having changed remarkably little since the Mesozoic Era. These massive fish were once harvested for their flesh and eggs, dramatically reducing their numbers. This resulted in the Gulf sturgeon being listed as threatened in 1991 under the Endangered Species Act. The Deepwater Horizon damage assessment estimated that nearly two-thirds of Gulf sturgeons in affected areas were exposed to oil, and studies indicate that sturgeon exposed to oil experienced damage to their DNA and immune system dysfunction.

## 10 YEARS LATER

### Need to restore spawning habitats

Like salmon, Gulf sturgeons are born in fresh water but spend most of their lives in the sea, returning to fresh water to spawn. Gulf sturgeons spawn only in seven river systems — the Pearl, Pascagoula, Escambia, Yellow, Choctawhatchee, Apalachicola, and Suwannee — and only in specific types of habitats within these rivers. Recovery is slowed by the loss of spawning grounds, particularly in places where dams block access to traditional spawning grounds upstream. Research is underway to better understand which estuarine habitats are most important for juvenile Gulf sturgeon. This research will help prioritize future restoration efforts. Other efforts are focusing on ways to restore and reconnect spawning habitats, such as a project that would remove three low dams in the Pearl River basin in Mississippi.



09

# Spotted Seatrout

PHOTO: TIM DONOVAN - FWC

**THE SPOTTED SEATROUT**, also known as speckled trout, is an economically important species of fish, and it is particularly prized by recreational anglers and Gulf restaurant diners. Spotted seatrout spend their entire lives in one estuary and their numbers tell us something about the health of that system.

Laboratory studies have consistently shown that oil exposure is harmful for fish, particularly fish larvae. Given that spotted seatrout spawn during late spring and summer — when oil was present — there is no doubt that spotted seatrout were exposed to oil. Studies in oiled areas found impaired reproduction, reduced spawning frequency and anemia among spotted seatrout. Nevertheless, spotted seatrout numbers increased in 2010 and 2011 — along with many other coastal fish species. Scientists speculate the fishing closures after the oil spill may have reduced pressure to the point where numbers of fish were able to increase, at least in the short term.

## 10 YEARS LATER

### Restoring nursery habitat

Spotted seatrout are declining in many systems across the Gulf for a number of reasons, including increased fishing pressure, loss of habitat, water quality issues, and extreme floods. In response, all of the Gulf states have either recently tightened catch restrictions on speckled trout, or are actively considering it. The Gulf RESTORE Act Science Program started a five-year project in 2019 to study ways to help the species. Deepwater Horizon funds are also being used to restore spotted sea trout habitats in multiple places across the Gulf. One example is an effort to restore former agricultural lands into a functioning coastal ecosystem at Robinson Preserve, near Sarasota, Florida. By restoring mangroves and a variety of wetlands, the project should boost juvenile spotted seatrout numbers locally as well as other species of fish, oysters, and coastal birds.





10

# Brown Pelican




PHOTO: KATH ADMIRE

**BROWN PELICANS** covered in oil became the defining image of the Deepwater Horizon oil spill and recent research shows that the disaster's impacts on brown pelicans were significant. The official federal damage assessment estimates that somewhere between 10,000 and 19,000 brown pelicans died as a result of the oil spill. The damage assessment found that brown pelicans declined by 43 percent on Queen Bess Island alone between May to June 2010 — a time when the population would normally have increased. A separate study estimated that the disaster killed nearly 12 percent of the brown pelicans in the Northern Gulf. Even brown pelicans that survived the spill and only experienced small amounts of oil exposure suffered from anemia and other sublethal impacts.

## 10 YEARS LATER

### Rookery island restoration

Brown pelican habitats were also harmed by the oil, particularly coastal islands and the mangrove stands the birds use for nesting. Cat Island, an important pelican rookery, eroded away entirely after oil killed the mangroves holding it together. Nearby Queen Bess Island is one example of barrier island restoration funded by Deepwater Horizon funds. Queen Bess hosts the third largest colonial waterbird colony in Louisiana, and despite having eroded significantly both before and after the oil spill, it remains an important habitat for more than 60 species of birds. Over the winter of 2019-2020, Queen Bess Island was rebuilt, restoring 37 acres of habitat that will benefit multiple species of birds affected by the Deepwater Horizon disaster.

A photograph of two children running on a sandy beach. The child on the left is a girl with dark hair, wearing a blue floral tank top and white pants, carrying a yellow bucket and a yellow shovel. The child on the right is a boy with curly hair, wearing a plaid shirt and shorts, carrying a red bucket and an orange shovel. They are running towards the camera, with the ocean and a blue sky with clouds in the background. A green diagonal shape is in the top left corner.

# Protecting the Gulf of Mexico for Future Generations

The Gulf of Mexico's sandy beaches, vast wetlands and deep-water habitats support more than 15,000 species of wildlife. The Deepwater Horizon disaster called attention to the importance and fragility of an ecosystem that is often seen as resilient and taken for granted. The Gulf's natural resources support a robust economy that contributes vital pieces of our national experience – from eating oysters, to birdwatching or building sandcastles.

# To protect the Gulf of Mexico for future generations, we need to:

1

## Restore the health of the Gulf as a whole.

The legal battle in the aftermath of the Deepwater Horizon oil spill resulted in the largest environmental damage settlement in United States history. As a result of the criminal and civil fines from all parties, more than \$16 billion was made available for environmental restoration in the Gulf. About \$4 billion has been already used to fund restoration projects, including those described in this report. The \$12 billion remaining will be invested through 2032. This money, alongside increased funding to restore the Everglades and new investment promoting coastal resilience, means the Gulf of Mexico is experiencing the largest, most comprehensive ecosystem restoration effort in our nation's history.

This is an unprecedented opportunity and it is important to get it right. Restoring the health of the Gulf's estuaries — the places where rivers and freshwater flow into the Gulf — has the best potential to improve the outlook for wildlife, as estuaries provide important habitat for hundreds of species of fish and wildlife, including many that live in the deeper waters of the Gulf.

Sadly, the Gulf's estuaries have been in decline for decades for a multitude of reasons. Projects that restore wetlands, rebuild oyster reefs, protect important habitats from development, and recreate natural patterns of water flow and sediment deposition will help many species harmed by the oil. In addition to helping wildlife, many of these projects will help protect coastal communities from rising seas and extreme weather. The National Wildlife Federation's specific recommendations for restoration projects and strategies are available on our interactive website, [Making the Most of Restoration: Priorities for a Recovering Gulf](#).

Decisions about how to restore the Gulf should always be informed by the best available science. As new projects are constructed, robust data on their effects should be collected, standardized,

and centrally stored to promote efficiency and coordination and to allow for informed decision-making long into the future.

Despite this encouraging beginning, ultimately states will need additional funding for habitat restoration beyond the Deepwater Horizon settlement to ensure a sustainable future for people and wildlife.

2

## Continue to study the ecosystem- wide impacts of the disaster.

Many fundamental questions about the impacts of the oil spill on wildlife and habitats remain unanswered, but funding for new research on wildlife impacts is uncertain. Here are just two examples of pressing research needs that have been largely unfunded to date:

**OFFSHORE MARINE MAMMALS:** Ten years after the disaster, there has been almost no original research on the health of dolphins and whales in heavily oiled areas far offshore. (There has rightly been a significant amount of research into the health of coastal bottlenose dolphins.) We are just now seeing early results from a federal survey that suggests decreases in the numbers of oceanic dolphins in affected areas offshore. Additional research on the status of oceanic and continental-shelf marine mammals should be a priority.

**DEEP-SEA BENTHIC IMPACTS:** In 2019, there was much media coverage of the discovery that the floor of the Gulf around the wellhead appeared to be attracting, and then sickening, deep-sea crabs and shrimp. (The researchers hypothesized that degrading oil compounds attracted the crustaceans to the area by mimicking their sex hormones.) However, this grim-yet-fascinating study was only possible because scientists at the Louisiana Universities Marine Consortium were working on an unrelated project in the vicinity of the wellhead. Studying the oil's impacts on the floor of the Gulf is vital to our overall understanding of the disaster. This research should not be left to chance.



3

### Increase drilling safety.

Spills are common in the Gulf of Mexico, with smaller oil, gas and chemical spills happening daily. After the Deepwater Horizon disaster, the Obama Administration finalized a rule strengthening safety measures, such as new requirements for blowout preventers — a key piece of equipment that malfunctioned on the Deepwater Horizon. This rule was replaced with a weaker version in 2019, over the objections of experts within the Bureau of Safety and Environmental Enforcement. Furthermore, a recent Center for American Progress report found that federal inspectors took 38 percent fewer enforcement actions against offshore oil and gas operators from 2017 to 2019 than they did from 2014 to 2016. Congress should reinstate the 2016 Well Control Rule and require improved enforcement to ensure that offshore drilling is done as safely as possible.

4

### Restore protections for migrating birds.

The Deepwater Horizon is estimated to have killed as many as one million birds and BP had to pay \$100 million in fines for its violations of the Migratory Bird Treaty Act. In 2017, the Department of the Interior announced it would no longer enforce the Migratory Bird Treaty Act if birds were killed accidentally. This would mean the law would no longer apply in the case of oil spills — not even if a spill was caused by gross negligence. Congress should restore the law to its full strength.

5

### Keep the National Environmental Policy Act strong.

The Trump administration has proposed drastic rollbacks to the way the National Environmental Policy Act is implemented. Often referred to as the “Magna Carta” of our environmental laws, NEPA embodies the essential idea that federal decision-makers should ‘look before they leap’ when approving federally-funded projects like levees or highways or potentially damaging private endeavors such as oil and gas wells. The proposed rollback would exclude more projects from review, limit the types of impacts and number of alternatives that would be considered, weaken the requirements for science-based decision-making, and allow oil and gas companies to write the analysis of potential environmental impacts themselves. The Administration’s proposal would also create significant barriers to the public’s ability to comment on proposed projects. The Administration should reverse course on its dangerous decision to undermine the National Environmental Policy Act.

6

### Start the transition to cleaner energy.

Climate change is a looming threat to the Gulf of Mexico and the 22 million Americans who live in counties that border it. These threats include worsening hurricanes, outbreaks of toxic algae, sea level rise washing away beaches and drowning wetlands, mass bleaching of coral reefs, fishery disruptions, and many more. The science is clear — the world must cut greenhouse gas emissions in half by 2030, and reach net zero emissions by 2050 to avoid devastating climate impacts. At a bare minimum, Congress and the Administration should promote policies and invest in technologies that reduce demand for oil and support projects that take full advantage of the Gulf’s abundant wind and solar potential. Furthermore, governments at the state, local and federal levels should enact policies that protect and restore marshes, mangroves and seagrass beds as these habitats capture and sequester large amounts of carbon.

# Sources

## ↑ Introduction

*“an ecosystem-level injury”* – Natural Resource Damage Assessment Trustees. [Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement, Chapter 4, Injury to Natural Resources](#). 2016.

*30 percent larger footprint* – Science Advances. [Invisible oil beyond the Deepwater Horizon satellite footprint](#). 2020.

*one million birds* – Marine Ecology Progress Series. [Bird mortality from the Deepwater Horizon oil spill: I. Exposure probability in the offshore Gulf of Mexico, II. Carcass sampling and exposure probability in the coastal Gulf of Mexico](#). 2014.

## ↑ 01 – Kemp’s ridley

*considered at risk of extinction* – Gulf of Mexico Science. [Evaluation of the Status of the Kemp’s Ridley Sea Turtle After the 2010 Deepwater Horizon Oil Spill](#). 2016.

*annual increases in nesting came to an abrupt end in 2010* – Marine Turtle Newsletter. [Interruption of the Kemp’s Ridley Population’s Pre-2010 Exponential Growth in the Gulf of Mexico and its Aftermath: One Hypothesis](#). 2014.

*19 percent increase, long-standing problems could be a factor* – Chelonian Conservation and Biology. [Did Declining Carrying Capacity for the Kemp’s Ridley Sea Turtle Population Within the Gulf of Mexico Contribute to the Nesting Setback in 2010–2017?](#) 2018.

*half the Kemp’s ridleys had signs of oil exposure* – Endangered Species Research.  [\$\delta^{13}\text{C}\$  and  \$\delta^{15}\text{N}\$  in the endangered Kemp’s ridley sea turtle \*Lepidochelys kempii\* after the Deepwater Horizon oil spill](#). 2017.

*longstanding reduction in blue crabs* – North American Journal of Fisheries Management. [Environmental Drivers of the Spatial and Temporal Distribution of Spawning Blue Crabs \*Callinectes sapidus\* in the Western Gulf of Mexico](#). 2017.

*# nests over time* – Gladys Porter Zoo. [The Kemp’s Ridley Binational Project \(slides\)](#). 2018.

*work described in the 10 years later section* – Gladys Porter Zoo. [Five year report for the natural resource trustees for the state of Texas](#). 2015.

*multifaceted project* – NOAA. [Sea Turtle Early Restoration Project](#). 2019.

## ↑ 02 – Coastal Bottlenose Dolphin

*the most significant factor* – NOAA. [Investigation Results for the Cetacean Unusual Mortality Event in Northern Gulf of Mexico](#). 2016.

*more than a thousand dolphin carcasses* – NOAA. [In the Wake of the Deepwater Horizon Oil Spill, Gulf Dolphins Found Sick and Dying in Larger Numbers Than Ever Before](#). 2015.

*dolphins remain very ill, successful births remain low (statistics given at the presentation)* – Gulf of Mexico Oil Spill & Ecosystem Science Conference presentation. [Health Trends of bottlenose dolphins \(\*Tursiops truncatus\*\) in the eight years following the Deepwater Horizon Oil Spill: Evidence for Lack of Resilience](#). 2020.

*decades to recovery* – Deepwater Horizon Natural Resource Damage Assessment Trustees. [Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement, Chapter 4, Injury to Natural Resources](#). 2016.

*additional information* – NOAA. [Summarizing Five Years of NOAA Research on the Impacts of the Deepwater Horizon Oil Spill on Dolphins](#). 2015.

## ↑ 03 – Laughing Gull

*32 percent, 60 percent* – Marine Ecology Progress Series. [Bird mortality from the Deepwater Horizon oil spill. II. Carcass sampling and exposure probability in the coastal Gulf of Mexico](#). 2014.

*sublethal impacts* – Ecotoxicology and Environmental Safety. [Toxic effects of orally ingested oil from the Deepwater Horizon spill on laughing gulls](#). 2017.

*meaningful effects on food webs* – Deepwater Horizon Natural Resource Damage Assessment Trustees. [Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement, Chapter 4, Injury to Natural Resources](#). 2016.

*unexpected increase* – Archives of Environmental Contamination and Toxicology. [Anomalously High Recruitment of the 2010 Gulf Menhaden \(\*Brevoortia patronus\*\) Year Class: Evidence of Indirect Effects from the Deepwater Horizon Blowout in the Gulf of Mexico](#). 2017.

*Restoration outer coast barrier islands* – NOAA. [Louisiana Outer Coast Restoration: 2018 Annual Report. Deepwater Horizon Restoration Project Report](#). 2018.

## ↑ 04 – Deepwater Coral

*Long Lived, slow growing, 600 years old* – Topical Studies in Oceanography. [Growth rates and ages of deep-sea corals impacted by the Deepwater Horizon oil spill](#). 2016.

*A long-term study, 300 colonies & additional oiled coral communities have not yet been discovered* – Biological Conservation. [Long-term impact of the Deepwater Horizon oil spill on deep-sea corals detected after seven years of monitoring](#). 2018.

*decline between 2011 and 2014* – Coral Reefs. [Decline in condition of gorgonian octocorals on mesophotic reefs in the northern Gulf of Mexico: before and after the Deepwater Horizon oil spill](#). 2015.

*another write-up of the mesophotic reefs* – Deep Sea Research Part II: Topical Studies in Oceanography. [Coral injuries observed at Mesophotic Reefs after the Deepwater Horizon oil discharge](#). 2016.

*reductions in fish species* – Deepwater Horizon Natural Resource Damage Assessment Trustees. [Deepwater Horizon oil spill: Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement. Chapter 4: Injury to Natural Resources](#). 2016.

Proceedings of the National Academy of Sciences. [Footprint of Deepwater Horizon blowout impact to deep-water coral communities](#). 2014.

## Sources (continued)

### ↑ 05 – Bryde's Whale

*just 33 individuals remaining* – NOAA. [2017 - US Atlantic and Gulf of Mexico Marine Mammal Stock Assessments](#). 2018.

*only baleen whale, genetically distinct, listed as endangered* – NOAA. [NOAA Lists Gulf of Mexico Bryde's Whales as Endangered](#). 2019.

*17 percent, most affected offshore marine mammals, ongoing reproductive failure* – Deepwater Horizon Natural Resource Damage Assessment Trustees. [Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement, Chapter 4, Injury to Natural Resources](#). 2016.

*DWH penalties funding research* – NOAA RESTORE Science Program. [Trophic Interactions and Habitat Requirements of Gulf of Mexico Bryde's Whales](#). 2017.

### ↑ 06 – Eastern oyster

*8.3 billion oysters were lost as a result of the oil spill* – Deepwater Horizon Natural Resource Damage Assessment Trustees. [Deepwater Horizon oil spill: Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement, Chapter 4: Injury to Natural Resources](#). 2016.

*overview document* – Gulf of Mexico Sea Grant. [Oysters and oil spills](#). 2018.

*Example oyster project in Texas* – NOAA. [Oyster Restoration Engineering](#). 2018.

### ↑ 07 – Common loon

*800 loons* – Deepwater Horizon Natural Resource Damage Assessment Trustees. [Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement, Chapter 4, Injury to Natural Resources](#). 2016. Table 4.7.3.

*blood, fat, feathers and eggs* – Legislative-Citizen Commission on Minnesota Resources. [Assessing Contaminants in Minnesota Loons and Pelicans – Phase III](#). 2017.

*diminished health and reproductive fitness* – Science of the Total Environment. [Polycyclic aromatic hydrocarbons in blood related to lower body mass Minnesota Department of Natural Resources in common loons](#). 2016.

*restoration efforts* – NOAA. [Restoration of Common Loons in Minnesota](#). 2020.

### ↑ 08 – Gulf sturgeon

*damage from oil spill* – Deepwater Horizon Natural Resource Damage Assessment Trustees. [Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement, Chapter 4, Injury to Natural Resources](#). 2016.

*Specific spawning habitats* – Florida Marine Research Institute Technical Report. [State of Florida conservation plan for gulf sturgeon \(\*Acipenser oxyrinchus desotoi\*\)](#). 2001.

*dams block access* – NOAA. [Characterizing Gulf Sturgeon Spawning Habitat, Habitat Use and Origins of Juvenile Sturgeon in the Pearl and Pascagoula River Systems](#). 2018.

*juvenile sturgeon, estuarine habitats* – Deepwater Horizon Open Ocean Trustee Implementation Group. [Monitoring and adaptive management activities implementation plan: Informing Gulf sturgeon population status and trends as a baseline to evaluate restoration](#). 2019.

### ↑ 09 – Spotted seatrout

*impaired reproduction, anemia* – Deepwater Horizon Natural Resource Damage Assessment Trustees. [Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement, Chapter 4, Injury to Natural Resources](#). 2016.

*impaired reproduction and anemia* – CRC Press. [Impacts of the Deepwater Horizon oil spill on the reproductive biology of spotted seatrout \(\*Cynoscion nebulosus\*\)](#). 2015.

*fishery closures* – PLoS ONE. [Response of coastal fishes to the Gulf of Mexico oil disaster](#). 2011. (and) [Transactions of the American Fisheries Society. Dynamics of Near-Coastal Fish Assemblages following the Deepwater Horizon Oil Spill in the Northern Gulf of Mexico](#). 2015.

*new catch restrictions on speckled trout* – news stories from [Texas](#), [Louisiana](#), [Mississippi](#), [Alabama](#), & [Florida](#).

*RESTORE Science Program five-year project* – NOAA. [Building Resilience for Oysters, Blue Crabs, and Spotted Seatrout to Environmental Trends and Variability in the Gulf of Mexico](#). 2019.

### ↑ 10 – Brown pelican

*somewhere between 10,000 and 19,000 brown pelicans, declined by 43 percent* – Deepwater Horizon Natural Resource Damage Assessment Trustees. [Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement, Chapter 4, Injury to Natural Resources](#). 2016.

*killed nearly 12 percent* – Marine Ecology Progress Series. [Bird mortality from the Deepwater Horizon oil spill. II. Carcass sampling and exposure probability in the coastal Gulf of Mexico](#). 2014.

*anemia and other sublethal impacts* – Environmental Toxicology and Chemistry. [Hematological indices of injury to lightly oiled birds from the Deepwater Horizon oil spill](#). 2018.

*restoration efforts* – Birds and Oil Spills; Gulf of Mexico SeaGrant Seminar. [Bird abundance, colony distribution, and targeted habitat restoration in Louisiana](#). 2020.

### ↑ Protecting the Gulf of Mexico for Future Generations

*possible decreases in oceanic dolphins* – 2020 Gulf of Mexico Oil Spill and Ecosystem Science Conference. [Presentation: Cetacean Abundance Trends in the Northern Gulf of Mexico and Poster Number 101: Distribution Patterns of Sperm Whale and Oceanic Dolphin Sightings From Vessel Surveys Conducted Before and After the Deepwater Horizon Spill](#). 2020.

*deep-sea crabs and shrimp* – Royal Society Open Science. [Persistent and substantial impacts of the Deepwater Horizon oil spill on deep-sea megafauna](#). 2019.

*over the objections of BSEE experts* – Wall Street Journal. [When Safety Rules on Oil Drilling Were Changed, Some Staff Objected. Those Notes Were Cut](#). 2020.

*38 percent fewer enforcement actions* – Center for American Progress. [10 Years After Deepwater Horizon, Oil Spills and Accidents Are on the Rise](#). 2020.



# Join others in helping wildlife.

The National Wildlife Federation, our partners and our affiliates are all working to make sure that money from the various settlements is used to right the wrongs of the spill and to tackle the underlying problems and ongoing stressors facing the Gulf of Mexico.

READ THIS DOCUMENT ONLINE, VIEW PRESS KIT, AND DONATE AT  
[RestoreTheGulf.nwf.org](http://RestoreTheGulf.nwf.org)

## CONTACT

Lacey McCormick / 512-610-7765 / [mccormick@nwf.org](mailto:mccormick@nwf.org)



*The report was written by Jessica Bibza and Lacey McCormick with assistance from Ryan Fikes, Amanda Fuller, David Muth, Alisha Renfro, and Jessie Ritter.*

*The National Wildlife Federation thanks the Walton Family Foundation for its generous support of our efforts to restore the Gulf of Mexico, including the creation of this report.*