U.S. Fish & Wildlife Service

National Conservation Training Center

Oil Spill Curriculum

USFWS

Birds, Habitat, & People: Recovering from the Deepwater Horizon Gulf Oil Spill

The Shorebird Sister Schools Program presents an activity that explores the impacts of the Deepwater Horizon Gulf Oil Spill on coastal birds and the work of many dedicated professionals helping in species recovery, with a focus on career development.

To learn more about the Shorebird Sister Schools Program (SSSP) visit: http://www.fws.gov/sssp.

Goal

Through studying a bird threatened by the Deepwater Horizon Gulf Oil Spill, students gain an understanding of the diverse job duties of people that work on refuges to conserve habitat for birds and other wildlife.

Grade: 9-12

Time: 3 class periods using the materials included with the activity.

Skills: cooperative work, reading comprehension, communication, discussion, organizing,
Subjects: science, language arts, social studies, geography
Objectives: Students will be able to—

1. Identify the threats to five bird species due to the Gulf oil spill.
2. Discuss the professional work and careers of people assisting in oil spill recovery.
3. Create a flow chart illustrating the oil spill's impacts on birds and wildlife habitat and the people working on the recovery effort.

Correlation to National Standards: See Standards chart.
Vocabulary: See activity definitions list.

Materials – Class Period 1

1. Deepwater Horizon Gulf Oil Spill and Southeast Louisiana NWR Complex maps & overheads.
2. Bird species profiles
3. Birds and Oil Student Worksheet #1
4. Overhead or electronic copy of student worksheet.
5. Background readings (Activity Background Information, Effects of Oil on Wildlife and Habitat, Breton NWR, Species factsheets)

Method - Class Period 1

1. Before class, read the activity background information. Begin the class with an overview of the oil spill asking the class these questions to stimulate discussion.
    - Why are oil companies drilling in the Gulf of Mexico? How is oil used in our society?
    - What happened to the Deepwater Horizon platform?
    - Why are people worried about the spill?
    - What happens to the animals that became covered with oil?
    - What happens when the oil reaches the coast?
    - What is the process of biomagnification of pollutants?
    - What is the responsibility of the U.S. Fish and Wildlife Service?

    Fill in student knowledge gaps with information from the background article.

2. Explain that students will explore the affects of the oil spill on wildlife and habitat at the Southeast Louisiana National Wildlife Refuge Complex (NWR) and will learn about the refuge staff working on spill recovery. Pass out copies of Oil Spill Map and NWR Complex Map. With a partner, have students identify the locations of the 8 refuges within the SE Louisiana NWR complex on the Oil Spill Map. If you are short on time, you could also do this as a whole class activity. Ask students to circle or highlight Breton and Delta National Wildlife Refuges. These are the 2 refuges of the complex most affected by the oil spill.

3. Divide the class into 5 groups and assign each group a bird species. Give each group factsheets of their species, *Effect of Oil on Species and Habitat*, and *Breton National Wildlife Refuge*. Each group should read the factsheets and answer the questions on the *Birds and Oil Student Worksheet* for their species. If time is short, allow students in their groups, to divide up finding the answers to the first 3 columns. The last column should be filled out through discussion among group members by analyzing what they have learned about how their bird lives (answers in first 3 columns), to determine how it is threatened by the oil spill (4th column).

4. Bring students back together and have groups report back. As a class, fill in the *Birds and Oil Student Worksheet* chart, recording answers on the overhead. Have all students fill in the chart as the information is reported.

Materials – Class Period 2

1. Career profiles
2. U.S. Fish and Wildlife Service Careers List
3. Oil Spill Response Factsheet
4. Student Careers Worksheet #2
5. Birds and Oil Student Worksheet #1 (from part 1 of this activity)

Method – Class Period 2

1. Briefly review the activity and discussion from the previous day. Explain that in part 2, students will learn about the people employed at the U.S. Fish and Wildlife Service's Southeast Louisiana National Wildlife Refuge Complex. They are working to protect and recover the habitat and wildlife after the Deepwater Horizon Gulf Oil Spill.

2. Students should return to their groups. Hand out the career profiles, one to each student (repeats are OK). Each student should read the career profile. Then, in their groups, students should fill out the Careers Student Worksheet. If there is sufficient time or as homework, have student's research other types of jobs that are involved in the oil spill cleanup. This could include researching other organizations and agencies such as the Coast Guard, NOAA, National Park Service, and Environmental Protection Agency.

   A great website to begin research is http://www.restorethegulf.gov/fish-wildlife.

3. With the entire class, discuss the variety of careers presented. Pass out the *U.S. Fish and Wildlife Service List of Careers*. Give students a minute to read through the variety of careers. Now ask if they learned something new about any jobs present at the refuge or on the list. If anyone is interested in learning more about a particular career, discuss how they could research that position. (Find out where the closest wildlife refuge is located. Interested students can volunteer to work at the refuge visitor center or join the refuge friends group. Many refuges have a few paid summer job opportunities for high school students.

4. Close the activity by having students to pull out their Birds and Oil Student Worksheet #1 from part 1 of the activity. Ask them to individually fill out the last column of the chart drawing on information from the career profiles and class discussion.

Materials – Class Period 3

1. Poster board or newsprint, and markers
2. Student Worksheets #1

Assessment – Class Period 3

1. Using the information the students have gathered from the two previous class periods, have students, in groups or as a class, create a flow chart following one of the sample models included with this activity. Give them a minimum number of impacts, actions, and careers to put under each category. The flow chart must include a title and a discussion. Post the class project in class or on a school bulletin board.
2. Afterwards meet with students individually, asking them to explain their flow chart.
3. Assess students on their group participation in working with the chart.

Extension (Or homework activity)

Using the information in the chart and the factsheets 'Effects of Oil on Wildlife and Habitat,' and 'Birds, Habitat, & People: Recovering from the Deepwater Horizon Gulf Coast Oil Spill Background.' ask each student to draw a Gulf Coast food web and compose a paragraph summarizing the affects the oil spill on the web.

How Can You Help Conserve Fish & Wildlife

Visit a refuge, park, or other natural area near you. Many public lands are open free-of-charge. Consider asking for a birdwatching tour.

- If you live near the coast, volunteer for a beach clean-up.
- Volunteer for a beach or stream restoration project in your area.
- Join a local club, such as scouting or 4 H, which supports natural resource conservation.

Birds, Habitat, & People: Making it through the Deepwater Horizon Gulf Oil Spill

Activity Background

What happened?

Hundreds of oil wells have been drilled into the ground beneath the Gulf of Mexico. At each deep-water well, a pipe carries the oil from deep in the Gulf floor up to a platform that floats on the water's surface. Here the oil is collected and transported to the land to be refined.

On April 20, 2010 a new 5,000 foot oil well had just been drilled. The name of the drilling platform was the Deepwater Horizon. Suddenly, some natural gas and oil accidentally escaped from the well and gushed to the surface. The fuel exploded in a huge fireball directly beneath the drilling platform, killing 11 people and injuring 17. The damaged platform quickly sank and pulled the pipe leading from the well down with it. The broken pipe leaked for more than 85 days, spilling an estimated 200 million gallons of oil into the Gulf of Mexico.

Why are people worried about the spill?

The oil that was escaping from ocean floor was a dark, thick, sticky liquid with a strong odor. Much of the oil floated to the surface and spread, creating an oil slick that covered thousands of square miles. It coated everything it touched in a layer of sticky oil. Dispersants were used to help breakdown the oil, but many people were concerned that the dispersants were as toxic as the oil itself. The oil also polluted the water and air above it. The fumes were dangerous to breathe. Huge plumes of suspended oil were also spreading beneath the ocean surface, and no one is sure what kind of damage they may do to living things. The oil washed up onto beaches and infiltrated into coastal wetlands. This presented, and continues to present, a serious threat to all the plants and animals that live in the coastal environment.

What happens to animals that get covered in oil?

A drop of oil the size of a dime can be fatal to most birds. Birds get oil on their feathers when they dive into the water for food or when they land on the surface to rest. When they try to clean their feathers with their beaks, they accidentally swallow some of the oil. The oil also hurts their eyes and harms their lungs. People are capturing some of these birds and trying to clean them, but many of the oil-soaked birds still die. Non-lethal effects on birds include behavioral, neurological, digestive, and reproductive impairment.

Ocean animals, such as sea turtles and porpoises, also get oil on them when they come to the surface to breathe. Oil is harmful to their bodies in many ways, especially if they swallow it or breathe the fumes. Hundreds of sea turtles have died from the spill. Smaller creatures are not safe either. Countless larval (young) fish, shrimp, crabs, oysters, and hatchlings sea turtles have also been killed by the pollution.

Some animals that survive the original spill bioaccumulate the toxic substances found in the oil and may later die from poisoning or are rendered unable to breed. Some toxic chemicals in oil bioaccumulate because they are stable and do not breakdown quickly; water soluble compounds spread and are ingested and excreted by many organisms; and pollutant compounds soluble in fats may accumulate in the animal's stored fat tissue. Pollutants that can biomagnify enter the food chain and increase in concentration in animals as they move up the chain. The pesticide DDT is an example of a pollutant that is biomagnified in the food chain. A few decades ago, birds like the brown pelican had accumulated DDT in such high levels from eating contaminated fish that they were only able to lay thin-shelled eggs, which were crushed during incubation.

What happens when the oil reaches the coast?

The Mexican Gulf Coast is one of the most productive natural areas in the entire world, with millions of acres of marsh, swamp, forests, and barrier islands. Hundreds of species of birds and other wildlife feed and nest there, including some that are rare and endangered. Wetlands in the Gulf of Mexico serve as nurseries for many species of marine fish and invertebrates. The wetlands help protect the coastline from hurricanes and other tropical storms.

When oil enters a wetland, it covers almost everything it touches—the plants, the herbivorous animals, and their predators. When birds come to feed, they can get coated in oil or become poisoned by the oil-covered animals they consume. The oil soaks into the sand and suffocates and poisons clams and worms and other living things burrowing below the surface. When the oil-covered plants die wetlands frequently disappear due to erosion as plant roots no longer hold the soil in place.

Who's working on protecting wildlife and habitats from the Gulf spill?

There are thousands of people from federal, state, and local agencies and organizations working together to protect the Gulf Coast water, land, fish, and wildlife affected by the spill. For this activity, we are going to focus on the work being done at the U.S. Fish and Wildlife Service's Southeast Louisiana National Wildlife Refuge Complex. The Complex is made up of 8 separate national wildlife refuges. However, 2 of those refuges were the most impacted by the oil spill; Breton and Delta National Wildlife Refuges. In addition to refuge staff, many U.S. Fish and Wildlife Service employees came from other refuges and field and regional offices from all over the United States to help with recovery efforts. Some came for a few weeks while others stayed for months. The people at the refuge will continue working with other USFWS staff and other agencies to assess and monitor the Gulf spill impacts on wildlife and habitat, and assist in their recovery. Oil spill recovery work will be needed for years to come.

Who is the U.S. Fish and Wildlife Service?

The U.S. Fish and Wildlife Service is a federal agency within the Department of Interior whose mission is to work with others to conserve, protect, and enhance, fish, wildlife, plants, and their habitats for the continuing benefit of the American people. The USFWS is responsible for implementing and enforcing some of our Nation's most important environmental laws, such as the Endangered Species Act, Migratory Bird Treaty Act, Marine Mammal Protection Act, North American Wetlands Conservation Act, and the Lacey Act. The USFWS fulfills these responsibilities by protecting and recovering federally endangered and threatened species; monitoring and managing migratory birds; restoring nationally significant fisheries; enforcing federal wildlife laws, conserving and restoring habitats such as wetlands, and distributing millions of dollars to states, territories, and tribes for fish and wildlife conservation projects. The Service also manages the National Wildlife Refuge System that consists of 560 National Wildlife Refuges covering over 150 million acres of land.

For more information about the Southeast Louisiana NWR Complex or the U.S. Fish and Wildlife Service see the overview factsheets included with this activity.

Sources:

National Wildlife Refuge Association. 2010. Impacts of Deepwater Horizon Oil Spill on Coastal National Wildlife Refuges. http://www.refugeassociation.org/new-pdf-files/NWRAgulfspill_factsheet.pdf

National Wildlife Federation. 2010. Ranger Rick: The Big Oil Spill. http://www.nwf.org/Kids/Ranger-Rick/People-and-Places/Ranger-Rick-on-The-Big-Oil-Spill.aspx

U. S. Fish and Wildlife Service. 2008. Agency Overview, Conserving the Nature of America. http://www.fws.gov/pdfs/AgencyOverviewTransition2009.pdf

Effects of Oil on Wildlife and Habitat

The U.S. Fish and Wildlife Service is the federal agency responsible for many of the nation's fish and wildlife resources and one of the primary trustees for fish, wildlife and habitat at oil spills.

The Service is actively involved in response efforts related to the Deepwater Horizon oil spill that occurred in the Gulf of Mexico on April 20, 2010. Many species of wildlife, including some that are threatened or endangered, live along the Gulf Coast and could be impacted by the spill.

Oil spills affect wildlife and their habitats in many ways. The severity of the injury depends on the type and quantity of oil spilled, the season and weather, the type of shoreline, and the type of waves and tidal energy in the area of the spill.

Oil can be categorized into five groups, ranging from very light to very heavy oils. Most oil has a density less than water, so it floats. Oil tends to spread into a thin layer on the water surface as a sheen. Once in the water, oil undergoes weathering, a process that describes the physical, chemical, and biological changes that occur when oil interacts with the environment.

FWS/Drew Wirwa

Protective boom deployed at Breton National Wildlife Refuge.

Weathering reduces the more toxic elements in oil products over time as exposure to air, sunlight, wave and tidal action, and certain microscopic organisms degrade and disperse oil. Weathering rates depend on factors such as type of oil, weather, temperature, and the type of shoreline and bottom that occur in the spill area.

Types of Oil

Although there are different types of oil, the oil involved in the Deepwater Horizon spill is classified as light crude. Light crude is moderately volatile and can leave a residue of up to one third of the amount spilled after several days. It leaves a film on intertidal resources and has the potential to cause long-term contamination.

Impacts to Wildlife and Habitat

Oil causes harm to wildlife through physical contact, ingestion, inhalation and absorption. Floating oil can contaminate plankton, which includes algae, fish eggs, and the larvae of various invertebrates. Fish feeding on these organisms can subsequently become contaminated through ingestion of contaminated prey or by direct toxic effects of oil. Larger animals in the food chain, including humans, can consume contaminated organisms as they feed on these fish.

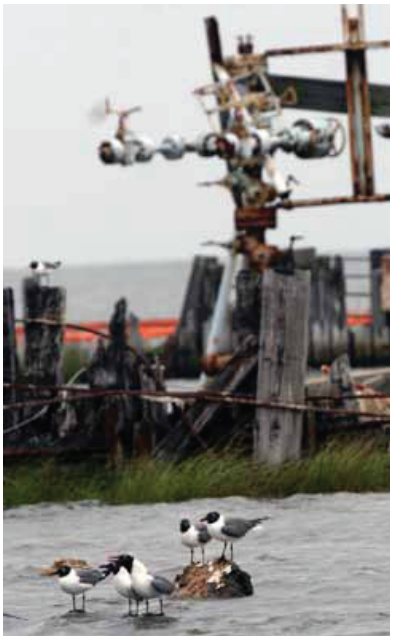
Although oil causes immediate effects throughout the entire spill area, it is the external effects of oil on larger wildlife species that are often immediately apparent.

Species of Concern

Birds and Mammals

Birds such as brown pelicans are likely to be exposed to oil as they float on the water's surface. Oiled birds can lose the ability to fly, dive for food or float on the water which could lead to drowning. Oil interferes with the water repellency of feathers and can cause hypothermia in the right conditions.

As birds groom themselves, they can ingest and inhale the oil on their bodies. While ingestion can kill animals immediately, more often it results in lung, liver, and kidney damage which can lead to death. Bird eggs may be damaged if an oiled adult sits on the nest.



FWS/Tom MacKenzie

Laughing gulls at Breton National Wildlife Refuge. Booms deployed in background.

Scavengers such as bald eagles, gulls, raccoons, and skunks are also exposed to oil by feeding on carcasses of contaminated fish and wildlife.

Long-term effects on birds and marine mammals are less understood, but oil ingestion has been shown to cause suppression to the immune system, organ damage, skin irritation and ulceration, and behavioral changes. Damage to the immune system can lead to secondary infections that cause death and behavioral changes may affect an animal's ability to find food or avoid predators. Long-term consequences can include impaired reproduction potentially impacting population levels.

Sea Turtles

Sea turtles such as loggerheads and leatherbacks could be impacted as they swim to shore for nesting activities.

Shellfish

Oil can be toxic to shellfish including bottom dwelling (lobsters, crabs, etc.) and intertidal (clams, oysters, etc.) species. The bottom dwelling species may be particularly vulnerable when oil becomes highly concentrated along the

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FWS/Nick Wirwa

A brown pelican that had been oiled and then cleaned soars after being released at Pelican Island National Wildlife Refuge near Vero Beach, Florida on 5/10/10.

shoreline. Some can survive exposure, but may accumulate high levels of contaminants in their bodies that can be passed on to predators.

Fish
Fish can be impacted directly through uptake by the gills, ingestion of oil or oiled prey, effects on eggs and larval survival, or changes in the ecosystem that support the fish. Adult fish may experience reduced growth, enlarged livers, changes in heart and respiration rates, fin erosion, and reproductive impairment when exposed to oil. Oil has the potential to impact spawning success as eggs and larvae of many fish species are highly sensitive to oil toxins.

Plants
Marine algae and seaweed responds variably to oil, and oil spills may result in die-offs for some species. Algae may die or become more abundant in response to oil spills. Although oil can prevent the germination and growth of marine plants, most vegetation appears to recover after cleanup.

FWS/Tom MacKenzie

BP contractors loading protective booms in Venice, Louisiana on 4/30/10 to be deployed in the Gulf of Mexico.

Habitat
Oil has the potential to persist in the environment long after a spill event and has been detected in sediment 30 years after a spill. On sandy beaches, oil can sink deep into the sediments. In tidal flats and salt marshes, oil may seep into the muddy bottoms. Effects of oil in these systems have the potential to have long-term impacts on fish and wildlife populations.

The Service responds to oil spills to minimize impacts to trust resources. The Service's work continues long after a spill event occurs. Damage assessments of habitat and wildlife are conducted to find ways that will minimize long-term effects on new generations of wildlife.

Hotlines

For media: Joint Information Center: 713/323 1670 and 713/323 1671

To report claims related to damages: 800/440 0858

To volunteer: 866/448 5816

To report oiled or injured wildlife: 866/557 1401

On the web

The USCG Joint Incident Command: http://www.deepwaterhorizonresponse.com/go/site/2931/

Department of the Interior: http://www.doi.gov

U.S. Fish and Wildlife Service: http://www.fws.gov/home/dhoilspill

http://www.twitter.comUSFWSSoutheast/

Tweets related to oil spill under hashtag #oilspill

http://www.facebook.com/pages/US-Fish-and-Wildlife-Service/282/48315774

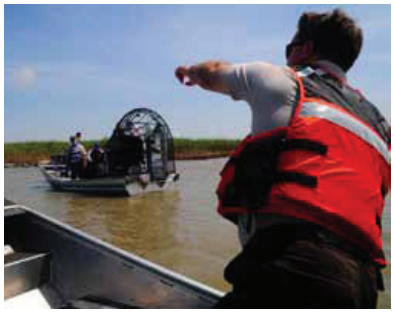
June 2010

Oil Spill Response

U.S. Fish and Wildlife Service veterinarian Dr. Sharon Taylor and Robert Love of the Louisiana Department of Wildlife and Fisheries prepare to release a Green Heron into the wild after being cleaned at a Wildlife Rehabilitation Center in Ft. Jackson, La. photo: Thomas Gresham.

The Fish and Wildlife Service's Role in Oil Spill Response

During spills, the U.S. Fish and Wildlife Service protects threatened and endangered species, migratory birds, and certain fish, marine mammals, and sea turtles. As a major federal landowner, we are also responsible for preparing for and responding to oil spills that may impact the 150 million acre National Wildlife Refuge system. We provide scientific and technical advice to Coast Guard, the Environmental Protection Agency, state fish and wildlife agencies, and responsible parties support their efforts to contain spills. We also work with our partners and co-trustees, such as the National Oceanic and Atmospheric Administration, other Department of the Interior bureaus, states, and Indian tribes to help response personnel avoid or minimize injury to natural resources.



Jason Duke, a geographic information systems coordinator with the Service, directs an airboat to search for oil off the coast of South Pass, La. photo: Petty Officer 3rd Class Stephen Lehmann.

Guiding Response Actions to Protect Habitats and Sensitive Species

Our field biologists's intimate knowledge of local resources and sensitive ecological areas makes us invaluable to those directing response activities, prioritizing spill countermeasures, and conducting clean-up work. Our advice is particularly valued when wetlands, refuge lands, federally listed species, migratory birds or the habitat supporting these species are potentially or physically impacted.

Leading the Survey, Capture and Rehabilitation of Oiled Wildlife

We work together with responding agencies by taking a leading role in wildlife protection. Field staff use a variety of methods to deter wildlife, especially birds, from oiled areas. This may include hazing techniques such as scare balloons, propane cannons or other noise makers, and air boats. We also conduct surveys to determine where oiled birds and wildlife may be found, and assist with their safe capture and transportation to rehabilitation centers. Service staff work with the appropriate agencies to oversee wildlife rehabilitation contractors as they clean oiled birds and wildlife and return healthy individuals back to the wild.

The Current Spill

We continue to support the joint agency response to the Deepwater Horizon oil spill in the Gulf of Mexico. The Service has many experienced technical specialists, scientists, land managers, and support personnel involved in the oil spill response. The Service is taking aggressive steps to protect ecologically sensitive areas on the Gulf Coast national wildlife refuges that potentially could be impacted.

Oversight of Wildlife Rehabilitation

Under the Oil Pollution Act of 1990, the responsible party – BP in the current case - is charged with hiring and funding firms to handle the many jobs required by a spill such as this, including wildlife rehabilitation. BP has hired Tri-State Rescue and Research and the International Bird Rescue Research Center, well-respected service providers that operate under existing permits issued by the Service. They work closely with the Service and state fish and wildlife agencies to compile data accurately, complete necessary testing and support field activities aimed at saving as many birds and wildlife as possible. Federal agencies, including the Service, are providing oversight of BP's efforts in this and other areas.

Effective Training and Planning

To ensure the safety of our responders, Service staff are trained and provided the resources required to integrate their activities within the larger response effort. We also participate in pre-spill planning and coordination efforts of Regional Response Teams. This participation helps us maintain a strong working relationship with our response partners.

A Continued Commitment to Conservation

The Service remains committed to its role as a partner in conserving America's natural resources. Effectively responding to oil spills is a key element of this commitment, and effective response involves building solid relationships with our partners and ensuring that our people are trained and ready to act when a spill occurs.

Containment boom is staged at the Breton National Wildlife Refuge.

Hotlines

To report oiled or injured wildlife: 866/557 1401

For media: Joint Information Center: 713/323 1670 and 713/323 1671

To report claims related to damages: 800/440 0858

To volunteer: 866/448 5816

For more information about the Service's response and our resources at risk:

http://www.fws.gov/home/dhoilspill

May 2010

Breton National Wildlife Refuge
and the 2010 Gulf Oil Spill

photo: USFWS

Protective boom surrounds an island at Breton NWR.

photo: USFWS

Oil on beach at part of Breton NWR.

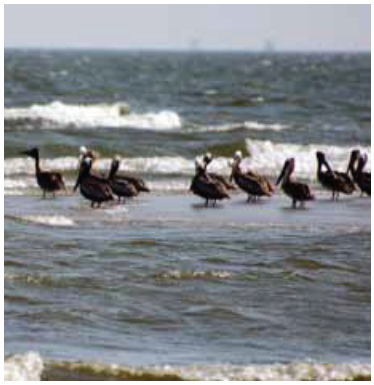


photo: Byron Fortier

Brown Pelicans loafing just off the beach at Breton.

photo: USFWS

Brown Pelicans nesting.

Refuge Facts

- Established in 1904 through executive order of President Theodore Roosevelt; second-oldest refuge among the over 540 in the National Wildlife Refuge System. Only refuge visited by Roosevelt, in 1915.
- Acres: 13,000 in St. Bernard and Plaquemines parishes. Wilderness designated 1975, 5,000 acres.
- Largest tern colony in the nation. Important area for Reddish Egrets. Nesting habitat for various other colonial seabirds. Large non-breeding concentration of Magnificent Frigatebirds. Concentration of Redhead Ducks with a few Canvasbacks and scaups.
- Refuge consists of barrier islands located in the Gulf of Mexico off the southeast coast of Louisiana.
- Largest nesting colony of Brown Pelicans in the southeast region. Pioneering research underway to study bird movements, distribution, and breeding ecology.

The Gulf of Mexico Oil Spill

On April 20, 2010 a drilling rig explosion led to uncontrolled leaking of oil into the Gulf of Mexico in the vicinity of Breton NWR. The federal government, including the U.S. Fish and Wildlife Service, along with state and local governments and private citizens, are working to limit the impacts to coastal ecosystems along the northern Gulf of Mexico.

Questions and Some Answers

What are the public use impacts of the spill at Breton NWR?

The refuge is closed to all public use at this time. Increased disturbance and visitation can jeopardize nesting success of the Pelicans and Terns. The air space above the refuge has aircraft restrictions.

What are the immediate threats to the Refuge and its wildlife?

Beached oil or oil sheen on the water can impact wildlife. Oil on the birds can decrease their feathers' waterproofing and even small amounts if ingested can kill the birds. Brown Pelicans are especially at risk because they dive into the water for fish and can easily get coated with oil.

Oil on the eggs of nesting birds can coat and suffocate the developing chicks inside - even a light coating of oil can kill developing eggs. The nesting season for pelicans and terns is from March through August. Oil suspended in the water can kill both fish and aquatic vegetation. Oil on the island vegetation can kill it, decreasing habitat and increasing erosion of the islands.

What are some tools that the refuge is using to deal with the oil spill?

Staff continuously monitor for presence of oil. Both hard and soft boom is used to keep oil away from the islands. Absorbent boom is used to collect oil that reaches land. The booms require constant maintenance and repair and do not work well in rough waters.

What are the long-term impacts of this spill?

We do not know for sure, but if the oil kills large amounts of the little animals found at the bottom of the food chain, the animals that photosynthesize and are food for the larger fish who are then food for birds and other animals, then the long-term impacts could be great.

If the suspended or surface oil repeatedly contaminates areas the impacts may be great. The overall impact will depend on the amount of oil and the length of time over which contamination occurs. Oil left on beaches for an extended time is harder to clean and causes greater damage.

U.S. Fish & Wildlife Service

Is there anything you can do to help?

At this current time there is not much an individual person can do to help at Breton NWR. What you can do is stay engaged and informed. Refuge Friends organizations are mobilizing to assist with support on the spill. Contact a local bird rehabilitator and offer assistance. Be prepared to be asked in the future because your help will be needed long term.

Oiling Impacts on Refuge

- Beached oil or oil sheen on the water can impact wildlife. Even a light coating of oil can kill developing eggs.
- Small amounts of oil can kill shorebirds when ingested.
- Oil left on beaches for extended time is harder to clean and causes greater damage.
- Oil suspended in the water can kill both fish and aquatic vegetation.

Oil Spill Management Tools

- Both hard and soft boom is used to keep oil away from the islands
- Absorbent boom is used to collect oil that reaches land.
- Staff continuously monitor for presence of oil.
- Booms require constant maintenance and repair.
- Booms do not work well in rough waters.

Public Use Impacts

- The refuge is closed to all public use at this time
- The air space above the refuge has aircraft restrictions
- Increased interest and visitation can jeopardize nesting success of the Pelicans and Terns.

When is the nesting season for the pelicans and terns?
The nesting season is from March through August.

Hotlines

To report oiled or injured wildlife:
866/557 1401

Media inquiries:
Joint Information Center:

985/902 5231 and 985/902 5240

To report claims related to damages:
800/440 0858

To volunteer: 866/448 5816

For more information about the Service's response and our resources at risk:

http://www.fws.gov/home/dhoilspill

May 2010

Kenneth Litzenberger, Project Leader
Jack Bohannon, Refuge Manager
Southeast Louisiana Refuges
Bayou Lacombe Centre
61389 Highway 434
Lacombe, LA 70445
Phone: 985/882 2000
Fax: 985/882 9133
E-mail: southeastlouisianarefuges@fws.gov

U.S. Fish & Wildlife Service

Delta National Wildlife Refuge
and the 2010 Gulf Oil Spill

Refuge Facts
- Established: 1935.
- Acres: 48,800.
- Located in Lower Plaquemines Parish, LA. Nearest town is Venice, LA. Refuge sub-headquarters are located in Venice. Actual refuge location is seven miles south of Venice. Access is by boat only. It requires traveling and crossing the Mississippi River.

Natural History
Refuge is a dynamic landscape that is part of the currently active delta of the Mississippi River. Formation of what is now the refuge began in mid 1800's at Cubit's Gap. Refuge was established as a bird sanctuary. An abundance of ducks, geese, raptors, wading birds, shorebirds, and several bird rookeries are on the Refuge. Refuge is composed of fresh-to-brackish marsh habitat nurtured by rich Mississippi River sediments.

Financial Impact of Refuge
- Approximately 7500 visitors in fiscal 2009.

Refuge Purposes
- Provide wintering habitat and sanctuary for waterfowl and other migratory birds.
- To protect and enhance endangered species.
- To restore and preserve marshland habitat.
- To provide compatible consumptive and non-consumptive public use.

The Gulf of Mexico Oil Spill
On April 20, 2010 a drilling rig explosion led to uncontrolled leaking of oil into the Gulf of Mexico in the vicinity of Delta NWR. The federal government, including the U.S. Fish and Wildlife Service, along with state and local governments and private citizens, are working to limit the impact to coastal ecosystems along the northern Gulf of Mexico.

Workers place absorbent boom on Delta NWR, photo by USFWS/Drew Wirwa.

Questions and Answers

What are the public use impacts of the spill at Delta NWR?

A portion of the refuge is closed due to an earlier, unrelated pipeline rupture that occurred in early April. The remainder of the refuge is open.

What are the immediate threats to the Refuge and its wildlife?

There is potential for oil damage to marsh vegetation. The areas most likely to be impacted are outer fringes of the Refuge which border the Gulf of Mexico. Interior marsh areas are more protected, and benefit from outflows of water from the Mississippi River which tend to push oil away. External marshes are composed mainly of Roseau cane (phragmites) which grows in deeper waters and is less prone to root damage from oil. Interior marshes contain important food plants such as delta duck potato and three-square which are relied upon by many waterfowl and wading bird species. These marshes could be seriously impacted in the event of a large storm event that pushed oil deeper into the refuge. If marsh vegetation dies, erosion can occur rapidly as these plants hold the marsh together.

Beached oil or oil sheen on the water can impact wildlife. Oil on birds can decrease their feathers' waterproofing and even small amounts of fresh oil if ingested can kill the birds. Weathered oil is less of a threat as volatile compounds diminish with exposure to the elements. Birds that dive for aquatic foods are especially at risk because they can easily get coated with oil.

Oil on the eggs of nesting birds can coat and suffocate the developing chicks inside - even a light coating of oil can kill developing eggs. If chicks are exposed to oil they are more impacted than adults due to their lack of well-developed protective feathers.

What are some of the bird species potentially at risk on Delta NWR?

Secretive marsh birds such as rails, gallinules, and moorhens are nesters on the refuge. Egrets nest in taller willows along the banks of waterways. Resident waterfowl species currently nesting on the refuge include mottled ducks and black-bellied whistling ducks. Many other species of migrating ducks and geese winter on Delta Refuge, and will begin arriving this fall.

U.S. Fish & Wildlife Service

If oil is present then, there is potential for great impact to these wintering birds.

What are some tools that the refuge is using to deal with the oil spill?
Staff continuously monitors for presence of oil. Both hard and soft boom is used to keep oil away from the marshes . Absorbent boom is used to collect oil that reaches land. As the exterior Roseau cane marshes are less susceptible to oiling damage, some booms have been pulled further in to protect more vulnerable interior marshes.

Hotlines

To report oiled or injured wildlife:
866/557 1401

Media inquiries:
Joint Information Center:
985/902 5231 and 985/902 5240

To report claims related to damages:
800/440 0858

To volunteer:
866/448 5816

For more information about the Service's response and our resources at risk:
http://www.fws.gov/home/dhoilspill

July 2010

Hard boom and absorbent boom require frequent monitoring to ensure effectiveness, photo by USFWS/Drew Wirwa.

American Oystercatcher
(Haematopus palliates)

Range and Description
The eastern race of the American oystercatcher breeds on the Atlantic and Gulf Coasts from New England south to Texas. In the winter they flock together along coastal habitat from New Jersey to Texas. They are found in every state along the Gulf Coast. In particular, northwest Florida supports 1,000 wintering oystercatchers. That's 15% of the total oystercatcher population.

The American oystercatcher is a common coastal salt marsh and sandy beach shorebird. They are large and showy, and a bit funny looking with a bright red-orange bill and a yellow eye and an orange-red eye ring. Their sturdy and laterally flattened bill is specially adapted for opening mussels and oysters. In young birds, the bill is a pinkish brown and dusky black toward the tip. Breeding and non-breeding plumages are almost identical in American oystercatchers. They have black heads and necks and dark blackish brown underparts. They have white wing and upper-tail patches. Their legs are a tan or sandy color.

Behavior and Diet
Oystercatchers peck the surface or probe deeply in the mud and sand for oysters, clams, and mussels. They have two techniques for removing them from their shells. They might plunge their bill, which is a cross between a knife and a chisel, into the open shell of an unsuspecting clam. Or they can hammer the shell open with a few well-aimed blows.

Nesting
Since oystercatchers are monogamous and most don't migrate, biologists think that these shorebirds may mate for life.

American oystercatchers nest on marsh islands, upland dunes, or right on the beach. Their nest is a simple scrape lined with tiny pebbles, bits of shell and seaweed. A pair of oystercatchers may make up to five nests before deciding on which one to use! In marshy spots the oystercatcher may line its nest with reeds. The 1 –3 eggs are extremely well camouflaged. They are colored like the sand and marked with dark splotches that look like little bits of shell and stones. Oystercatchers are perhaps the most attentive of all shorebird parents. Without the need to migrate long distances, oystercatchers spend up to a year feeding and teaching their chicks how to find and open clams and mussels.

This is one of the few shorebirds that have actually expanded its range northward along the Atlantic Coast. Their success may have to do with the fact that they are such specialized feeders and attentive parents. It may also help that they are strictly coastal birds that migrate only short distances if at all.

Migration
Most populations of the American oystercatcher are considered to be a resident, non-migratory. They will flock up in the fall and winter but only those birds from the Middle and Northern Atlantic regions migrate south in the winter.

Threats
These shorebirds are shy and intolerant of people. Since coastal property is always in demand for recreation and development, people are perhaps the greatest threat to breeding oystercatchers.

The American oystercatcher builds nests in open, sandy areas that are very vulnerable to predators like red fox, cats, dogs, or predatory birds. Pollution is also a great threat to oystercatchers. It can contaminate both their food supply and their nesting habitat.

Sources:

1. Shorebird Sister Schools Program Educators Guide "Explore the World with Shorebirds!". CD-ROM. U.S. Fish and Wildlife Service, 2003.

2. Gulf Coast Shorebirds. Excel File. Western Hemisphere Shorebird Reserved Network. June 2010. <http://www.whsrn.org/whsrnews/press-room>

3. "Scientists Work to Protect Shorebirds from Gulf Coast Oil Spill." Western Hemisphere Shorebird Reserved Network. October 14, 2010. PRWeb. <http://www.prweb.com/releases/manomet/gulfshorebirds/prweb4052144.htm>

Brown Pelican
(Pelecanus occidentalis)

Range and Description
The brown pelican is common along the southern portions of the Pacific and Atlantic Coasts, and throughout the Gulf Coast.

Measuring up to 54 inches long, weighing 8 to 10 pounds, and having a wingspan between 6-1/2 feet and 7-1/2 feet, brown pelicans are the smallest members of the seven pelican species found worldwide. They can be identified by their chestnut-and-white necks; white heads with pale yellow crowns; brown- streaked back, rump, and tail; blackish- brown belly; grayish bill and pouch; and black legs and feet.

Behavior and Diet
Pelicans are long-lived birds. One pelican captured in Florida had been banded 31 years earlier!

Brown pelicans are strong swimmers; young ones barely able to fly have been timed swimming at 3 m.p.h. Rather clumsy walking on land, pelicans fly with their necks folded and their heads resting on their backs, using slow, powerful wing beats. Pelicans are primarily fish-eaters, requiring up to 4 pounds of fish a day. Their diet consists mainly of small schooling fish such as menhaden, herring, sheepshead, pigfish, mullet, grass minnows, topminnows, and silversides.

Brown pelicans have extremely keen eyesight. As they fly over the ocean, sometimes at heights of 60 to 70 feet, they can spot a school of small fish or even a single fish. Diving steeply into the water, they may submerge completely or only partly—depending on the height of the dive—and come up with a mouthful of fish. Air sacs beneath their skin cushion the impact and help pelicans surface.

The pouch suspended from the lower half of the pelican's long, straight bill can hold up to 3 times more than the stomach. In addition to being used as a dip net, the pouch holds the pelican's catch of fish until the accompanying water—as much as 3 gallons— is squeezed out. During this time, laughing gulls may hover above the pelican, or even sit on its bill, ready to steal a fish or two. Once the water is out, the pelican swallows the fish and carries them in its esophagus. The pouch also serves as a cooling mechanism in hot weather and as a feeding trough for young pelicans.

Nesting
Pelicans are highly social and gregarious. Adult males and females and juveniles congregate in large flocks for much of the year.

Brown pelicans typically begin to breed between the ages of 3 and 5 years, generally, nesting on protected islands. The birds nest in large colonies on the ground, in bushes, or in the tops of trees. On the ground, a nest may be a shallow depression lined with a few feathers and a rim of soil built up 4 to 10 inches above ground, or it may be a large mound of soil and debris with a cavity in the top. A tree-top nest usually consists of reeds, grass, and straw heaped on a mound of sticks interwoven with the supporting tree branches.

The male delivers material to the female, who builds the nest. She typically lays 2 to 3 chalky white eggs that hatch in about a month. In most of the nesting range of the pelican in the United States—from South Carolina to Florida in the East, in Southern California in the West, and in Alabama, Louisiana, and Texas on the Gulf—peak egg-laying usually occurs in March through May.

Parents share in incubating the eggs and raising the young. Like many birds, newly hatched pelicans are altricial, born blind and featherless, completely dependent upon their parents. They soon develop down that is soft and silky, followed by typical feathers. Average age at first flight is 75 days.

Migration
Some brown pelicans may migrate north along the Pacific and Atlantic Coasts in the spring.

Threats
The brown pelican was nearly wiped out by the insecticide DDT. By the 1970s only a small population remained. Thanks to banning DDT the population rebounded and the brown pelican was removed from the Endangered Species list in 2009. Brown pelicans are still vulnerable to habitat loss, oil spills and pollutants that can contaminate their food supply. Their colonies are also sensitive to disturbance by human activities.

Source:

U.S. Fish and Wildlife. Brown Pelican factsheet. November 2009. <http://www.fws.gov/contaminants/pdf/brown_pelicanfactsheet09.pdf>.

Laughing Gull
(Larus atricilla)

Range and Description
Named for its loud laughing type of call, this gull is abundant along the Gulf Coast. In fact, scientists estimate that 25% of the total laughing gull population lives along the northern Gulf Coast (Mississippi Delta of Louisiana to the Florida Panhandle), the primary area impacted by the Deepwater Horizon oil spill. They range along both the Atlantic and Gulf Coasts.

This bird species is well adapted to the presence of humans and their activities. You have probably seen them around picnic grounds, parking lots, following fishing boats, and at garbage dumps. Laughing gulls take advantage of dredge spoil islands for breeding. Dredging is the process of excavating sand from shallow sea beds to open up lanes for ships, to create or repair islands or to replenish coastal beaches.

They are 15 to 18 long and weigh 7 to 13 ounces. They are a medium-sized gull with a black head in the breeding season. In the non-breeding season, their head feathers molt to white and grey.

Behavior and Diet
Laughing gulls are at home on the ground, in the water, or in the air. They are strong, graceful fliers and can hover in the air when feeding on insect swarms. They are strong swimmers and can rise rapidly into the air. They frequently bathe and preen. They may sleep within the nesting colony in the breeding season, and in rafts on the water outside of the breeding season. Laughing gulls forage for a variety of foods including earthworms, flying insects, beetles, snails, crabs, crab eggs, fish, squid, garbage, and even berries. They will normally feed at the edge of the water, but will go inland during storms or high tides to find insects and worms in plowed fields. If on land, they will simply pick up food on the surface. If swimming, they will forage for food floating in the water or just below the surface. They can also eat insects while in flight and dive into the water for fish. Savvy gulls may hover over pelicans or even perch on their bill, while the water drains from the bird's mouth hoping to grab a fish. They may even chase terns hoping to steal their food!

Nesting
Laughing gulls begin the breeding season in April and will lay 2 to 4 eggs. In the Gulf, they nest in large colonies on dry islands. Both the male and female will build the nest using grass and other plant material. The chicks are semi-precocial at hatching, which means their eyes are open, they are born covered with down and are capable of leaving the nest soon after hatching. They remain close to their parents who continue to protect and feed them.

Migration
Depending on their location on the Gulf Coast, laughing gulls may migrate a short distance or remain year-round at one site.

Threats
Disturbance to their nesting colonies can threaten breeding success. Pollution of their food supply and their habitat is also a great threat. They are extremely vulnerable to oil on the water's surface and washing on shore.

Sources:

1. Cornell Lab of Ornithology & American Ornithologist Union. "Laughing Gull". The Birds of North America Online. 2010. <http://bna.birds.cornell.edu/bna/species/225/articles/introduction>.

2. Cornell Lab of Ornithology. "Laughiing Gull." All About Birds. 2009. <http://www.allaboutbirds.org/guide/Laughing_Gull/lifehistory>

3. U.S. Fish and Wildlife Service. Beach-nesting Birds of the Gulf factsheet, May 2010. <http://www.fws.gov/home/dhoilspill/pdfs/DHBirdsOfTheGulf.pdf>.

4. Thompson III, Bill. The Young Birder's Guide to Birds of Eastern North Americas. New York: Houghton Mifflin, 2008.

Piping Plover
(Charadrius melodus)

Range and Description
The piping plover is listed as by the U.S Fish and Wildlife Service as a threatened species. During the breeding season piping plovers are found in scattered locations along the Atlantic Coast, and in the Northern Great Plains of the United States and Canada. In the winter, they can be found along the Atlantic and Gulf Coasts from North Carolina to Texas. Piping plovers wintering along the Gulf Coast typically breed in the Northern Great Plains.

The piping plover is a small shorebird that grows to 7 inches in length. It has a sandy-colored back and white underparts, with a single black neck band, a short stout orange bill and orange legs. The chicks are extremely tiny and could be described as looking like cottonballs on legs.

Behavior and Diet
Piping plovers feed along beaches and intertidal mud and sand flats. Primary prey for piping plovers includes worms, various crustaceans, insects, and occasionally bivalve mollusks. The plover's richest food sources are located in the intertidal zone, the wrack line, and in the sparse vegetation in the lower dunes. The intertidal zone is the sand area exposed during low tide and underwater during high tide. The wrack line is the beach area where organic material accumulates, including seaweed, seashells, driftwood and other natural materials.

Small sand dunes, debris, and sparse vegetation within adjacent beaches provide shelter from the wind and extreme temperatures.

Nesting
Piping plovers make shallow scrapes in the sand that they line with small pebbles or rocks. The female lays 3 to 4 eggs and both parents share in incubation duties. The eggs hatch after about 28 days, and the young leave the nest within hours. The chicks can forage for themselves immediately, but remain near their parents for several weeks for protection and brooding or shading for temperature control . Depending on food availability, it takes the young from around 18 to 28 days to begin flying. The tiny down- covered chicks are quickly able to follow their parents, learning where to find tiny worms, beetles, beach lice, sand fleas and other invertebrates.

Migration
The sandy beaches of the Gulf Coast are important wintering habitats for the piping plover. The birds arrive on the Gulf Coast in August on migration from their Northern Great Plains breeding grounds.

Threats
Piping plovers often nest on beaches where people like to live and enjoy the shoreline. Their nests and young are often accidently crushed by people walking or driving in vehicles. The presence of people also may cause the birds to desert their nest, exposing eggs or chicks to the hot sun and predators. Interruption of feeding may stress juvenile birds during critical periods in their life cycle. Free running dogs may harass or kill the birds. Many of the coastal beaches traditionally used by piping plovers for nesting, feeding, and roosting have been lost to commercial, residential, and recreational development. Also, development near beaches provides food that attracts increased numbers of predators such as raccoons, skunks, and foxes. The population of breeding adults is often determined by the availability of quality winter foraging and roosting habitat.

Along the Gulf in particular, piping plovers are at high risk from oil contaminating their food supply and oil cleanup workers disturbing their foraging and roosting areas.

Source:

U.S. Fish & Wildlife. All About Piping Plover. Website. <http://www.fws.gov/plover/facts.html.>

Redhead
(Aythay americana)

Range and Description
The redhead duck is widespread throughout the United States. It breeds in the northern latitudes of the United States into Canada. It winters on the Atlantic and Gulf Coasts. A high concentration of redheads winter at Breton National Wildlife Refuge off the Gulf Coast of Louisiana.

This duck is aptly named for its vivid red head. It is a medium-sized duck with a distinct rounded head. However, only the male has the bright red head, blue bill with black tip, black chest and rear end, and gray back. The female is a drab brownish color.

Behavior and Diet
The redhead prefers ponds, lakes, coastal bays and inlets. It is a diving duck and may dive to considerable depths. They can also travel great distances underwater. Aquatic plants are the food of choice including pondweed seeds, tubers, algae, wild celery, duckweeds, coontail, and water lily seeds. It tends to be a crepuscular feeder, active at dawn and dusk. It may float in rafts with other ducks during the day and night in deep water.

On the wintering grounds, redheads will gather with other ducks in large rafts in the thousands.

Nesting
Females make basket-like nests of reeds, cattails, and rushes lined with downy feathers. Some redhead hens parasitize the nests of other redheads or other duck species, laying eggs in their nest for the other hen to incubate and care for their young. This is generally not a successful nesting strategy, as in most cases the hosting duck will abandon the nest. Redheads do not nest on the Gulf Coast, only wintering there.

Migration
Redhead ducks migrate from their Northern Great Plains breeding grounds to the Gulf Coast in early fall.

Threats
On the breeding grounds, the greatest threat is the loss of nesting habitat due to agricultural development. On the wintering grounds, the primary threat is pollution contaminating their food supply and the wetland and open water habitat they prefer.

Sources:

1. "Redhead." Bird Web. Seattle Audbon Society. 2005. <http://www.birdweb.org/birdweb/bird_details.aspx?id=76>.
2. "Redhead". Wetlands for Tomorrow, Ducks Unlimited Canada. 2009. <http://wetlandsfortomorrow.ducks.ca/lwredhead>
3. Elphick, Chris, John B. Dunning, Jr., David Allen Sibley. National Audubon Society. The Sibley Guide to Bird Behavior. New York. Random House. 2001.

Southeast Louisiana National Wildlife Refuge Complex

The Southeast Louisiana National Wildlife Refuge Complex consists of eight federal wildlife refuges: Atchafalaya, Bayou Sauvage, Bayou Teche, Big Branch Marsh, Bogue Chitto, Breton, Delta, and Mandalay. Each of these national wildlife refuges was created to protect, and provide habitat for a great diversity of wildlife, fish and plants. These refuges are part of the National Wildlife Refuge System, which is a national network of 560 refuges throughout all 50 states and U.S. territories, which are managed by the U.S. Fish and Wildlife Service, in the Department of the Interior.

Atchafalaya NWR Established: 1984 Acres: 15,000

This refuge is part of the largest bottomland hardwood swamp in the United States, the Atchafalaya Basin. The Basin is an immense natural floodplain of the Atchafalaya River. This wetland ecosystem is important for a multitude of species including migratory birds.

Management Goals:
To improve plant communities for endangered, threatened and declining wildlife as well as for waterfowl and other migratory birds. Wildlife is also managed through public hunts and in cooperation with partners.

Bayou Sauvage NWR Established: 1990 Acres: 22,000

The refuge consists of freshwater and brackish marsh within the city limits of New Orleans. It is the nation's largest urban refuge. An enormous wading bird rookery can be found in the refuge from May through July, while tens of thousands of waterfowl wintering in its bountiful marshes.

Management Goals:
To enhance the populations of migratory, shore, and wading birds; protect endangered and threatened species; protect archeological resources; provide for scientific research and environmental education with an emphasis on wetlands; and, to provide opportunities for fish and wildlife recreation.

Bayou Teche NWR Established: 2001 Acres: 9,000

The refuge is rich in bottomland hardwoods and cypress-gum forests. The surrounding area includes oil and gas wells and canals.

Management Goals:
The refuge is managed to provide habitat and refuge for the threatened Louisiana black bear and to promote research and restoration of the bear; provide the highest quality habitat possible for migratory birds; provide environmental education and interpretation; and, allow for compatible public use activities.

Big Branch Marsh NWR Established: 1994 Acres: 18,000

The refuge habitat is consists of pine flatwoods, oak ridges, and fresh, brackish, and saltwater marsh. The diverse habitat of this refuge is a wonderful example of the natural coastline of Lake Pontchartrain, surrounded by rapidly developing human communities.

Management Goals:
The refuge is managed for the preservation, enhancement, and restoration of the valuable wetland and pine flatwood ecosystems.

Bogue Chitto NWR Established: 1980 Acres: 36,000

This refuge is part of the Pearl River Basin, one of the least disturbed swamplands in the U.S.. This refuge extends between Louisiana and Mississippi. Bogue Chitto means "Large Stream" in Choctaw, the Native Americans who are the original inhabitants of the Pearl Basin.

Management Goals:
To preserve and enhance wildlife habitat, manage for endangered species, and provide environmental education and compatible recreation opportunities.

Breton NWR Established: 1904 Acres: 13,000

This is the second oldest refuge in the U.S. President Theodore Roosevelt heard about the destruction of birds and their eggs on Chandeleur and Breton Islands in 1904 and soon afterwards created Breton NWR. Roosevelt visited Breton Island in June 1915, the only national wildlife refuge he ever visited.

Management Goals:
To provide sanctuary for nesting and wintering seabirds; protect and preserve the wilderness character of the islands; and, provide sandy beach habitat for a variety of wildlife species.

Delta NWR Established: 1935 Acres: 49,000

Its 49,000 acres were formed by the deposition of sediment carried by the Mississippi River. This area combines the warmth of the Gulf and the natural wealth of the river. Its lush vegetation is the food source for a multitude of fish, waterfowl and animals. Delta is the winter home for hundreds of thousands of snow geese, coots and ducks.

Management Goals:
Waterfowl habitat management, marsh restoration and management, and oversight of oil and gas development and production.

Mandalay NWR Established: 1996 Acres: 4,400

The refuge has a beautiful freshwater marsh with ponds, man-made levees, and canals. Oil and gas wells, and the Gulf-Intercoastal Waterway are other important man-made features in the area.

Management Goals:
The management goals are to provide the highest quality migratory bird habitat, provide for the needs of endangered plants and animals, allow compatible public uses, promote research and restoration of wetland resources and provide opportunities for environmental education and interpretation.

To learn more about the Southeast Louisiana National Wildlife Refuge Complex and the eight refuges in the complex visit: http://www.fws.gov/southeastlouisiana/index.html


20
49
55
12
10
Bogue Chitto
Atchafalaya
Big Branch Marsh
Bayou Teche
Bayou Sauvage
Breton
Mandalay
Delta


LOUISIANA
MISSISSIPPI
Baton Rouge
Covington
Atchafalaya NWR
Bogue Chitto NWR
Lafayette
Lake Maurepa
Lake Pontchartrain
Big Branch Marsh NWR
Pontchartrain Causeway
Bayou Sauvage NWR
New Orleans
Lake Borgne
Chandeleur Sound
Breton NWR
Franklin
Bayou Teche NWR
Houma
Mandalay NWR
Lake Salvador
Atchafalaya Bay
Breton Sound
Delta NWR
Venice
West Bay
East Bay
Garden Island Bay
GULF OF MEXICO

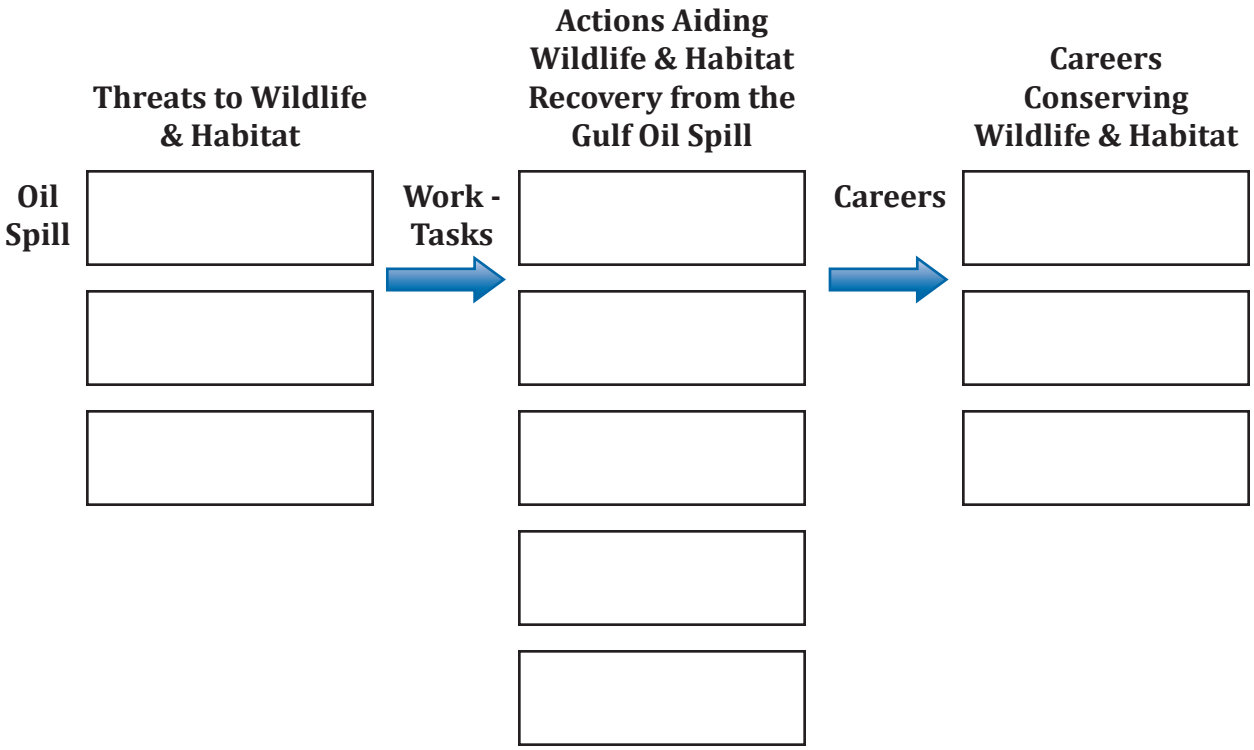
Birds, Habitat, People: Recovering from the Deepwater Horizon Gulf Oil Spill Activity

Birds and Oil Student Worksheet #1

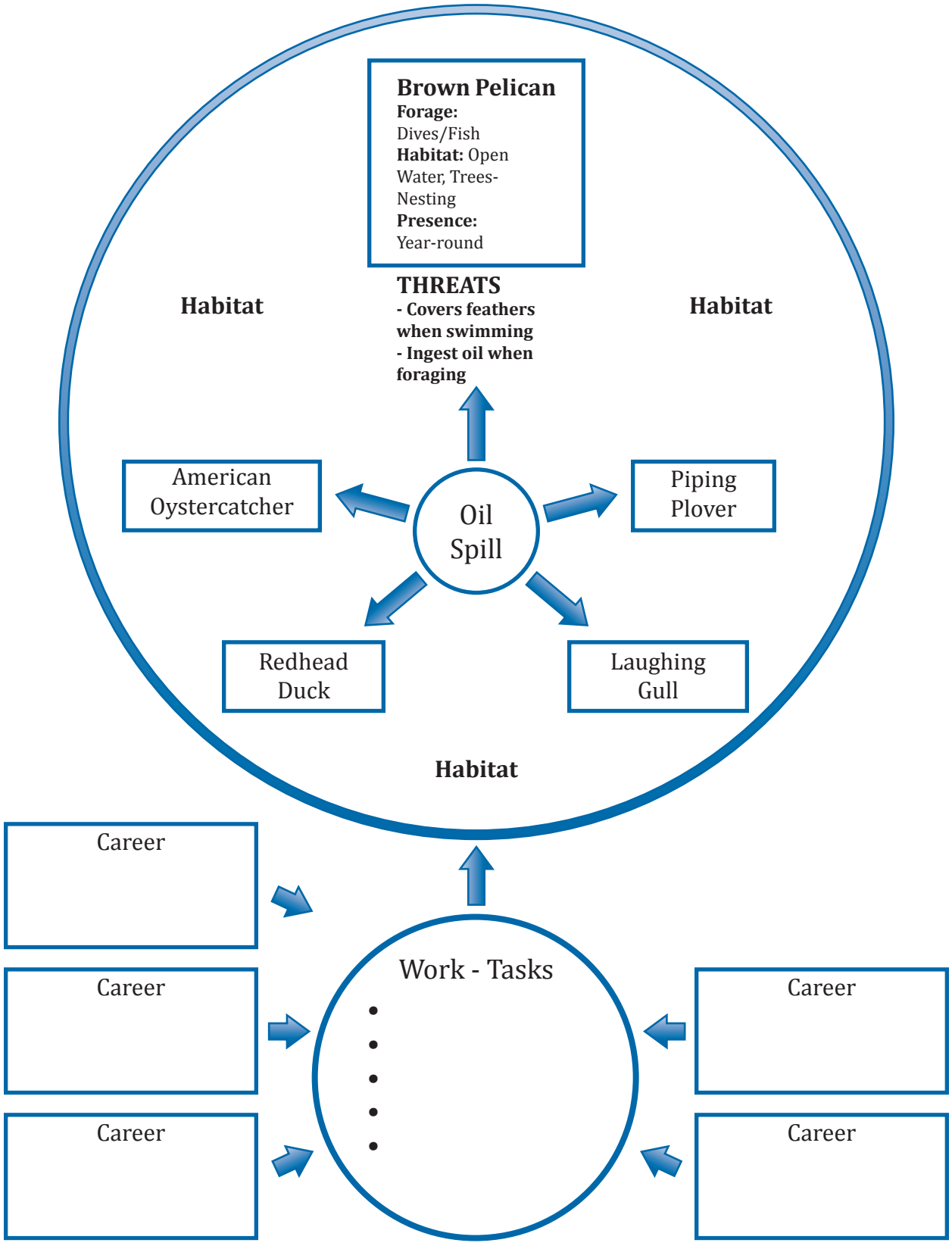
Part 1: Bird survival depends on healthy food, and safe nesting and roosting areas. In your study groups, read about a bird species listed below and answer the questions in the chart.
Part 2: Read the career profiles to learn about the people assisting in wildlife and habitat recovery. Record information below and discuss some of the things you learned about the different careers available in the U.S. Fish and Wildlife Service.

Bird Species	**What does it eat? How does it feed?**	**What habitat does it use? (feeding, nesting, roosting)**	**When is it present in the Gulf? (year round, breeding, or non-breeding time)**	**How does the Gulf oil spill threaten this species?**	**Part 2: Record for each Career Profile—** • Job Title • Oil spill duties • How does their work protect habitat & wildlife
Brown Pelican					
Laughing Gull					
American Oystercatcher					
Piping Plover					
Redhead Duck					

Worksheet Activity 1



Worksheet Activity 1



U.S. Fish & Wildlife Service

Agency Overview

Conserving the Nature of America

The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect and enhance fish, wildlife, plants and their habitats for the continuing benefit of the American people.

USFWS

The U.S. Fish and Wildlife Service is the premier government agency dedicated to the conservation, protection, and enhancement of fish, wildlife and plants, and their habitats. It is the only agency in the federal government whose primary responsibility is management of these important natural resources for the American public. The Service also helps ensure a healthy environment for people through its work benefiting wildlife, and by providing opportunities for Americans to enjoy the outdoors and our shared natural heritage.

The Service is responsible for implementing and enforcing some of our Nation's most important environmental laws, such as the Endangered Species Act, Migratory Bird Treaty Act, Marine Mammal Protection Act, North American Wetlands Conservation Act, and Lacey Act. The Service fulfills these and other statutory responsibilities through a diverse array of programs, activities, and offices that function to:

- Protect and recover threatened and endangered species
- Monitor and manage migratory birds
- Restore nationally significant fisheries
- Enforce federal wildlife laws and regulate international wildlife trade
- Conserve and restore wildlife habitat such as wetlands
- Help foreign governments conserve wildlife through international conservation efforts
- Distribute hundreds of millions of dollars to States, territories and tribes for fish and wildlife conservation projects

The Service also manages the 96 million acre National Wildlife Refuge System, the world's preeminent system of public lands devoted to protection and conservation of fish and wildlife and their habitats. The 548 units of the Refuge System receive over 40 million visitors each year who participate in hunting, fishing, wildlife observation and photography, environmental education and interpretation, and other outdoor recreation activities. Within the Fisheries program, the Service operates 70 National Fish Hatcheries, which in conjunction with Fish Health Centers and Fish Technology Centers restore native aquatic populations, mitigate for fisheries lost as a result of federal water projects, and support recreational fisheries throughout the United States.

The Service Today

The Service's origins date back to 1871 when Congress established the U.S. Fish Commission to study the decrease of the nation's food fishes and recommend ways to reverse the decline. Today, the Service utilizes 8,704 Full Time Equivalent Employees (FTEs), dedicated professionals located at facilities across the country, including a headquarters office in Arlington, VA, eight regional offices, and nearly 700 field offices.

The Service utilizes a diverse and largely decentralized organization to meet its conservation and management responsibilities. The headquarters office has primary responsibility for policy formulation and budget allocation within major program areas, while the Regional

offices have primary responsibility for implementation of these policies and management of field staff. This organizational structure allows the Service to address wildlife issues effectively at the regional, State and local level, as well as work effectively with a variety of partners, including other federal agencies, States, tribes, nongovernmental organizations and the public.

All of the Service's work is guided by a set of Conservation Principles. These include:

- **Stewardship** – Our ethic is to conserve natural resources for future generations.
- **People** – Our employees are our most valued asset.
- **Science** – Our work is grounded in thorough, objective science.
- **Partnerships** – We emphasize creative, innovative partnerships.
- **Professionalism** – We hold ourselves to the highest ethical standards, strive for excellence and respect others.
- **Legacy** – We ensure the future of natural resource conservation by connecting people with nature.
- **Service** – It is our privilege to serve the American people.

The Service's fiscal year 2009 budget request was $2.2 billion, which included over $800 million in permanent appropriations that is apportioned to the states and territories. Global climate change, shortages of clean water suitable for wildlife, and the alienation of children and adults from the natural world are critical challenges faced by the Service. In order to address these challenges, the Service has identified six priorities:

- **National Wildlife Refuge System** – Conserving Our Lands and Resources
- **Landscape Conservation** – Working with Others
- **Migratory Birds** – Conservation and Management
- **Threatened and Endangered Species** – Achieving Recovery and Preventing Extinction
- **Connecting People with Nature** – Ensuring the Future of Conservation
- **Aquatic Species** – National Fish Habitat Initiative and Trust Species

Looking Forward

The Service is working to develop a unifying landscape-based scientific framework called "Strategic Habitat Conservation" that will apply conservation planning and design, conservation delivery, research and monitoring to large areas with many interconnected habitats and species. The purpose of the Strategic Habitat Conservation framework is to respond to the impact on fish, wildlife, and plants from climate change and other growing threats, such as habitat fragmentation, urbanization, invasive species, disease, parasites, and water management.

Strategic Habitat Conservation is the Service's framework for landscape conservation. It is a structured, science-driven approach for making decisions about where and how to expend Service resources for species, or groups of species to achieve explicit biological objectives. Ultimately, Strategic Habitat Conservation will allow the Service to work more effectively across landscapes with partners such as the U.S. Geological Survey, state and tribal wildlife agencies, conservation organizations, landowners and other concerned groups and individuals to in ways that recognize that the future environment may differ markedly from the past.

An Introduction to the Organization

The following pages provide a brief overview of the major programs, resources, and organizational structure of the Service, as well as details on budgets, legal mandates, emerging issues and recent successes.

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http://www.fws.gov

November 2008

U.S. Fish & Wildlife Service

Careers

Conserving the Nature of America

Mission Critical Positions

Archaeologist

Botanist

Cartographer

Chemist

Civil Engineer

Contract Specialist

Ecologist

Education and Training Specialist

Environmental Engineer

Fish & Wildlife Biologist

Fishery Biologist

Forester

General Engineer

Geographer

Horticulturist

Hydrologist

Land Surveyor

Landscape Architect

Meteorologist

Microbiologist

Outdoor Recreation Planner

Park Ranger

Realty Specialist

Refuge Law Enforcement Officer

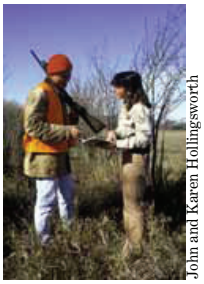
Refuge Manager

Refuge Operations Specialist

Wildlife Biologist

Wildlife Inspector

Criminal Investigator (Special Agent)



John and Karen Hollingsworth

Refuge law enforcment

Administrative/Support Positions

Accountant

Administrative Office

Budget Analyst

Computer Specialist

Environmental Protection Specialist

EEO Specialist

Facilities Manager

Management and Program Analyst

Human Resource Specialist

Public Affairs Specialist

Safety & Occupational Health Specialist

Statistician

Support Services Specialist

Visual Information Specialist

Writer/Editor

John and Karen Hollingsworth

Tagging loggerhead turtles

Pedro Ramirez/USFWS

Checking gill nets

William Campbell/USFWS

Reintroduction of threatened and endangered species

Technical Positions

Accounting Technician

Biological Technician

Budget Technician

Cartographic Technician

Civil Engineering Technician

Forestry Technician

Hydrologic Technician

Legal Instruments Examiner

Management Assistant

Human Resources Assistant

Procurement Technician

Evidence Custodian

Carl Zitzman

Confiscated illegal wildlife trade

Clerical Positions

Office Automation Clerk

Secretary

John and Karen Hollingsworth

An equal opportunity employer

Steve Hillebrand/USFWS

Migratory Bird Survey Pilot

Steve Hillebrand/USFWS

Habitat restoration, laying irragation pipe

Wage Grade Positions

Animal Caretaker

Auto mechanic

Carpenter

Electrician

Electronics Mechanic

Engineering Equipment Operator

Heavy Mobile Equipment Operator

Laborer

Maintenance Mechanic

Motor Vehicle Operator

Small Craft Operator

Tractor Operator

U.S. Fish & Wildlife Service
http://www.fws.gov

2010

USFWS

Controlled fire for habitat management

Career Profile

Include a PHOTO if possible!

Name:

Job Title:

Job Description:

Your role in the oil spill recovery:

Career Path: What kinds of education and experience led you to your current career? *Please include any key experiences in your youth and/or early adulthood that led to you to working for a natural resource agency.*

Can you make one recommendation to a young person interested in a job like yours?

Why do you like working for the U.S Fish and Wildlife Service?

Career Profile

Name: Annette Taylor

Job Title: Administrative Officer

Job Description:

I manage the budget for all eight refuges. I make purchases for the refuges and work on personnel activities too. I work hard to balance the budget.

This job requires that I be extremely organized and focused on details. It also helps to enjoy working with lots of different people.

Your role in the oil spill recovery:

I have managed the budget for the Gulf oil spill. I am buying all the equipment and supplies needed by staff working on the spill. I am tracking over-time and making sure everyone gets paid for their spill work.

Career Path:

I began my career with an associates degree in computers. I started as a clerk for the U.S. Fish and Wildlife Service. From there, I moved up to a typist, then to a secretary, and then to an administrative assistant.

To become the Administrative Officer, I had to return to school and earn 24 credits in accounting and management.

Can you make one recommendation to a young person interested in a job like yours?

Earn an associates or bachelor's degree in accounting and/or management.

Why do you like working for the U.S. Fish and Wildlife Service?

I enjoy the variety of this job; everyday is different. I work with law enforcement, biologists, educators, fire staff, refuge operations staff and more to order their equipment and manage their budgets. I learn so much about wildlife and habitat and what the staff on the refuge is doing. I find it challenging and fascinating. It is like putting together pieces of a puzzle.

Career Profile

Name: Byron Fortier

Job Title: Supervisory Park Ranger

Job Description:

I have a variety of duties. First, I manage the visitor center. This involves coordinating and recruiting volunteers to lead tours and greet visitors, overseeing building operations and the gift shop. I coordinate the exhibit planning and development for the center and plan the canoe trips and oversee the education programs. I am also the main contact for our Friends Group. Together, we write grants to support refuge projects and coordinate public events.

Your role in the oil spill recovery:

I wrote the oil spill factsheets for the Breton and Delta National Wildlife Refuges. I was a primary media contact. I served as the Refuge contact at the Ft. Jackson bird rehabilitation facility.

Career Path:

I had a life changing experience my senior year of college. I decided to take a seasonal job at Yellowstone National Park in the marina concession shop before finishing my last year of college. I was studying for a bachelor's degree in business administration. That experience opened my eyes that I really wanted to work in natural resources. I finished my degree but decided to pursue a Master's degree in parks and recreation management.

I continued with the National Park Service in seasonal jobs because it is very difficult to get a permanent job. Finally, I decided that I needed a full-time job and returned to my home state of Louisiana where I worked for an outdoor store in New Orleans for one year. At last, I got a break and was hired in a permanent position at a National Park Historic Site in New Orleans. I stayed there for 12 years but decided I wanted to move up the career ladder and started looking for other opportunities. That's when I started working for the U.S. Fish and Wildlife Service in visitor services and worked my way up to my current position.

Can you make one recommendation to a young person interested in a job like yours?

- A college degree is essential. It can be in a wide variety of fields.
- Perseverance. Hang in there and keep applying. Apply for positions that may not be your dream job. You can then plan to work your way towards your career goal.

Why do you like working for the U.S Fish and Wildlife Service?

I feel like I am doing something that is extremely important. I'm not just earning a paycheck. I am working to establish a feeling of ownership for this refuge complex among the public. The value and charm of refuges may be less obvious to the public, than a national park, so education and communication at these refuge sites is even more important.

Career Profile

Name: Bruce Mitchell

Job Title: Engineering Equipment Operator

Job Description:

I operate and maintain all heavy equipment. With this equipment, I maintain the roads, levees, and parking lots on the refuge.

Your role in the oil spill recovery:

I maintained the equipment that was being used for the oil spill.

Career Path:

After high school, I worked for a road construction company. I started flagging traffic and maintaining equipment. Slowly I worked my way up to an equipment operator position. It took me over 10 years to work my way up.

One of the companies I worked for had contracts on the refuge. I got to know the folks on the refuge doing the contract work. We struck a good relationship and when a position came open they let me know about it. I got the job and have been with the USFWS for 7 years.

Can you make one recommendation to a young person interested in job like yours?

I recommend taking college courses to jump-start your career. They now offer courses in construction management and heavy equipment operation that were not available when I started in this career.

Why do you like working for the U.S Fish and Wildlife Service?

I like the variety of work. Everything is different day to day. Also, I like the independence of the work and being able to work with little supervision.

Career Profile

Name: Danny Breaux

Job Title: Refuge Manager

Job Description:

I am the refuge manager for the Big Branch Marsh, Bogue Chitto, and Atchafalaya Refuges. My job is to supervisor the refuge staff of biologists, educators, equipment operators, and foresters. I oversee the biology, education, and forestry programs, guiding the development of the refuge, and improving and maintaining the facilities.

Your role in the oil spill recovery:

- I filled in for my staff working on the oil spill. For example, I was doing endangered red-cockaded woodpecker surveys and guiding contractors working on brush removal.
- Flew on helicopter details searching for oiled wildlife and identifying the location, type, and quantity of oil close to coast and important wildlife areas.
- Guided BP's placement of the oil booms to protect wildlife such as the beach-nesting Wilson's plover.
- Worked at Incident Command to improve communications between USFWS and other oil recovery partners.
- Searched for oil on the refuges I'm responsible for and monitored the clean-up.
- Monitored nesting colonies while BP was cleaning-up.

Career Path:

In high school, I wanted to be a veterinarian. So, I began in college in veterinary medicine with idea to work on wildlife, not just cats and dogs. But, after volunteering to help a zoo vet, I learned that was not what I wanted to do. So I switched my major to wildlife biology.

After school, I decided I wanted to work for a federal agency because I believed in the broader mission of public lands. U.S. Fish and Wildlife Service was the first one to call for an interview for a forestry position. I worked as a forester on the Atchafalaya National Wildlife Refuge. That work also included overall management duties too. This was good experience and allowed me to successfully obtain my current position.

Can you make one recommendation to a young person interested in a job like yours?

Volunteer. It is important to become known to refuge staff for good work.
Internships. Apply for internships in high school and college.

Why do you like working for the U.S Fish and Wildlife Service?

I believe in the mission to work with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people.

The job is satisfying. I like the variety of job duties, the people I work with, and the mission I am working for.

Career Profile

Name: Dave Demeyere

Job Title: Fire Management Officer

Job Description:

My staff and I are prepared and ready to respond and/or assist others with wildfires. We also have to keep our equipment in working order and ready-to-go. I write and implement prescribe fire plans to reduce fire hazards and manage wildlife habitat. I train staff.

Your role in the oil spill recovery:

I flew in helicopters over the spill area doing aerial surveys for injured wildlife.

Career Path:

I have a bachelor's degree in park recreation and resource management. I began working for the USDA Forest Service as a Park Ranger with some fire duties. Then I worked as a Forestry Technician for the U.S. Fish and Wildlife Service. I had opportunities to work on fires and decided that I wanted to pursue fire-specific positions. So, I took a job with the Bureau of Land Management as a Fire Operations Specialist. From there I worked my way to become a Fire Management Officer with the USFWS. All my fire training was on the job.

Can you make one recommendation to a young person interested in a job like yours?

- Go to college!
- Study a natural resource field.
- Try lots of different things to figure out what you like doing in natural resources.
- Volunteer and look for internships.

Why do you like working for the U.S Fish and Wildlife Service?

I like the mission of the Service. I like the small size of the Service and working with the people in the Service. Of all the federal natural resource agencies I have worked for, I enjoy working for the Service the most.

Career Profile

Name: Ken Litzenberger

Job Title: Project Leader of the Southeast Louisiana National Wildlife Refuge Complex

Job Description:

I manage all eight refuges in the complex. As the leader of this complex, it is my job to make sure all of the refuges are functioning and meeting their goals. These goals may include providing opportunities for fishing and hunting, providing quality environmental education programs, maintaining roads, building, and equipment, managing habitat, planning and executing prescribed fires. I also need to make sure we have qualified people and the people have the tools they need to get these jobs done.

Your role in the oil spill recovery:

My staff and I have worked very closely with BP to make sure the booms to control the oil were in place where we need them to protect our refuges. We also are instructing BP on where and how to clean up, being extra conscientious of the special needs to protect the habitat and wildlife on the refuges. We've also been communicating with the news media and giving tours.

Career Path:

After school I joined the military. After serving, I returned to school and earned a bachelor's and master's degrees in wildlife management. After school, I began working for the U.S. Fish and Wildlife Service as a refuge manager trainee and worked my way up to become a refuge complex project leader.

Can you make one recommendation to a young person interested in a job like yours?

- Volunteer, look for internships, and get experience anyway you can.
- Apply for a variety of jobs, even if they are not exactly what you want or you feel you are overqualified for. This will give you experience and get you into the agency. Once you are working for the U.S. Fish and Wildlife Service, you can more easily apply for other jobs.

Why do you like working for the U.S Fish and Wildlife Service?

Even after 30 years, I still find my job for the U.S. Fish and Wildlife Service satisfying and rewarding. I like making a difference for natural resources that will be here forever for the public to enjoy.

Career Profile

Name: Laura Thomas

Job Title: Administrative Assistant

Job Description:

I perform a wide variety of jobs. Because I sit at the front desk, I am the first point of contact for visitors who call or come to the office. I answer their questions about the refuge and tell them about recreation activities. I inventory and manage refuge property. I oversee payroll making sure it is submitted on time and I help staff with their time sheets. I arrange travel for staff and submit their paperwork for reimbursement. I also serve as the computer technician for the refuge complex, assisting with program and software problems.

Your role in the oil spill recovery:

I answered and directed phone calls from the media and the public. I handled the extra travel, purchases, and payroll paperwork.

Career Path:

In high school, I worked as a file clerk for a credit bureau. After high school, I moved up to the legal claims department. Later, I worked for a medical office billings and collection. Then, I started working for the Department of Defense when my husband, who was in the military, was transferred overseas. I started as a library technician and moved up to be the administrative assistant for the commander of flight operations at the base.

I began working for the U.S. Fish and Wildlife Service after my husband retired. I applied for the job here at the refuge.

I did not finish my degree but took a number of classes in business, computers, and psychology that have helped me in my job.

Can you make one recommendation to a young person interested in a job like yours?

- Learn to manage your time well. Take classes to learn to organize and manage your time better.
- You must be willing to work with refuge staff who have diverse needs.
- I recommend classes in business, computers (especially software & programming), and psychology.

Why do you like working for the U.S Fish and Wildlife Service?

I would recommend working for the U.S. Fish and Wildlife Service. I enjoy working with professional people who love their jobs. It creates a great working environment. I like the variety in my work and helping others. I also really enjoy getting to work in other areas of the refuge like helping plant trees, working at special events, and with environmental education programs.

Birds, Habitat, & People: Recovering from the Deepwater Horizon Gulf Oil Spill

Student Careers Worksheet #2

Read your career profile and then discuss the questions below with your study group.

1. Below list each job title and describe the position in one or more sentences.

2. What job do you find most interesting and why?

3. What do these jobs have in common? (for example - look at education, experience, and duties.)

4. What were the most common recommendations that employees gave for pursuing a job like theirs?

5. Why do these USFWS employee like what they do?

Deepwater Horizon Gulf Oil Spill Mock Public Meeting

The Shorebird Sister School Program, U.S. Fish and Wildlife Service presents an activity that explores the roles of natural resource professionals and community members in a mock town meeting convened to address the recovery of the coastal habitats from the Gulf oil spill.

To learn more about the Shorebird Sister School Program (SSSP) visit http;//www.fws.gov/sssp

Goal

Students will role play a mock public meeting convened to discuss the implications of the oil spill on an imagined Gulf Coast community and its natural environment. The role play format is a panel of local government experts answering questions from the public alarmed about the oil spill. Through research and role play, students gain an understanding of the duties and perspectives of both natural resource professionals and community members impacted by the spill, and begin to understand the complexities of decision making in the Gulf Region regarding wildlife and the environment. Students will become aware of the variety of natural resource professionals deployed to address the crisis.

Grade: 9-12

Time needed: 2 class periods.

Objectives: Students will —

1. Role play a person involved in the Gulf oil spill speaking at a town meeting, either as a member of the technical panel or as a questioning concerned citizen from the audience.
2. Research their assigned role to determine that person's perspective on the disaster.
3. If student role plays a technical panel member, research their role and write up a brief of their 3 general job duties and 3 oil spill duties
4. If student plays a community member questioning the panel, research their role and write up a 4 point rationale for their perspective and provide 2 questions for the technical panel.
5. Develop ground rules for the public meeting.

Correlation to National Standards (see attachment**)**
Vocabulary: public meeting, moderator
Skills: public speaking, research, reading comprehension, analyzing, questioning, role play
Subjects: language arts, social studies, science
Materials:

- Student worksheet
- Role-play character briefs
- Internet access
- Additional factsheets maybe needed for some panel roles and are listed under each.

Methods
Class Period 1

1. Before class, read the background article from National Wildlife Federation: The Big Oil Spill. Begin the class with an overview of the disaster spill asking questions to stimulate discussion. Here are some possible discussion questions.
    - Why are oil companies drilling in the Gulf of Mexico? What do we get from petroleum?
    - What happened to the oil rig?

- Why are people worried about the leak?
- What happens to the animals that became covered with oil?
- What happened when the oil reached the coast?

Fill in student knowledge gaps with information from the background article.

2. Ask students to think about all the people living and working in the area that may be affected by the spill. Generate a list on the board from the student's responses, making 2 columns, one column for the person and another column for how they are affected and their concerns.

Person	**How Affected**
Mother	Worries about the safety of feeding local seafood to her family, or her children swimming and playing on the coast.
Commercial Fisherman	Earns his living from Gulf fisheries, concerned about his livelihood and the future of his industry.

3. Explain that today the class will be participating in a mock public meeting. The meeting is being called to address Gulf community concerns and answer questions about the restoration of the coastal habitats, wildlife and fisheries impacted by the oil spill. A public meeting addresses an issue or concerns of people living in a particular geographic area. The public learns how the issue is being addressed by government authorities and has an opportunity to both ask questions and to share their concerns and perspectives within their community. No votes or decisions are usually made at public meetings; they usually serve as informational forums.

4. As a class, write the ground rules for the public meeting. Here are some sample ground rules you may use or that can help guide your students in writing their own.
    - Establish a meeting moderator.
      The moderator will designate when it is time for each person to speak, and enforce the time limit on speaking and behavior rules
    - Maintain equality.
      Each person speaking should be given the same amount of time to speak and equal opportunities to answer questions.
    - Present facts.
      All information presented should be based on facts.
    - Maintain Respect.
      Respect for others must be maintained throughout the meeting. Citizen role-players should not interrupt statements being given, and should remain civil and respectful to those giving statements.

5. Divide the class into 2 groups: panel members and community members. Decide whether to have students work individually or in pairs. Pass out 1 panel or community member card per individual/pair. Each person/pair reads their card and does additional research to further develop their role. Ask them to record additional research sources on their role card.

6. Give each student a worksheet to fill out. They should use it to guide them in the development of their role-play character. The remainder of class period can be devoted to conduct research for their role or it can be completed as homework.

Class Period 2

1. Set-up the classroom for the mock public meeting. Put chairs and desks at the front for panel members and arrange the seats for the audience. Review the ground rules with the class. Begin the meeting with the moderator and any panel member statements and then take questions from the audience.

2. Twenty minutes before the end of class, stop the public meeting. Engage the students in a discussion about what took place and any immediate lessons learned from the process.

Assessment

Collect and review the students' worksheets. Use these questions to guide your assessment:

- Had they conducted sufficient research to understand their character's job and perspective?
- Was their explanation of their role and perspectives well reasoned?
- Did they develop appropriate questions for the panel?
- Overall, did they represent their role-play character well in the mock public meeting?
- What did they learn about the Gulf spill and the many individuals in a wide range of natural resource and public service jobs deployed by government agencies to address the problem?

Deepwater Horizon Gulf Oil Spill Mock Public Meeting

Panel Roles

Technical Panel Members

You are a panel member representing the U. S. Fish and Wildlife Service at Breton and Delta National Wildlife Refuges. Use the description on your role card and the information about the refuges and oil spill response to develop your role-play character on the panel. Answer the questions on the student activity sheet. You may also use the additional links listed under your role to further develop your job/role character. Record any additional sources used on your role card.

Breton and Delta National Wildlife Refuges are the 2 refuges within the Southeastern Louisiana NWR Complex that have been most affected by the Gulf oil spill.

The following information and websites will help you develop your role in the activity:

Breton NWR:

- http://www.fws.gov/breton/index.html
- Breton 2010 Oil Spill Fact Sheet (included with the activity or visit http://www.fws.gov/home/dhoilspill/pdfs/Breton2010OilSpillFactSheet.pdf)

Delta NWR:

- http://www.fws.gov/delta/index.html
- Delta 2010 Oil Spill Fact Sheet (Included with the activity or visit http://www.fws.gov/home/dhoilspill/pdfs/Delta.pdf)

Overview of U.S. Fish and Wildlife Service and the Southeastern Louisiana National Wildlife Refuge Complex. See factsheets included with activity.

General Oil Spill Response Information

Restore the Gulf: http://www.restorethegulf.gov

U.S. Fish and Wildlife Service

General Info

- http://www.fws.gov/home/dhoilspill/

Oil Spill Response

- Factsheet included with activity or visit http://www.fws.gov/home/dhoilspill/pdfs/OilSpillFactSheet.pdf

NOAA: http://gulfseagrant.tamu.edu/oilspill/pdfs/Shorelines_coastal_habitats_FACT_SHEET.pdf

Wildlife Biologist

Your job focus is conserving wildlife and you are actively involved in monitoring wildlife populations within and adjacent to refuge lands impacted by the oil spill. Of particular interest is the endangered piping plover that winters on coastal refuges. The refuge also supports a large population of wintering redhead ducks. You are involved in monitoring the winter populations and making decisions on whether the hunting season can be opened or not on the refuge due to the oil spill. You want to encourage birders to help monitor bird populations by participating in bird counts.

Resources:

Career Profile factsheet: biologist James Harris

Science in Support of the Deepwater Horizon Oil Spill

- http://www.fws.gov/home/dhoilspill/pdfs/ScienceinSupportFactSheet.pdf

Update on U.S. Fish and Wildlife Service Oil Spill Response

- http://www.fws.gov/home/dhoilspill/

Additional Sources:

Botanist

Your job focus is on restoring coastal habitats that have been lost to hurricanes, annual erosion, and now the oil spill. You are actively involved in monitoring a variety of coastal and aquatic plants looking for signs of marsh vegetation affected by oil. You are actively recruiting volunteers and student interns to plant vegetation that will help stabilize the coast and provide additional habitat.

Resources:

Breton National Wildlife Refuge Factsheet:

- http://www.restorethegulf.gov/sites/default/files/imported_pdfs/external/content/document/2931/590347/1/DHR%20Breton%20NWR%20Oil%20Fact%20Sheet.pdf

NOAA: Shorelines and Coastal Habitat in the Gulf Oil Spill

- http://gulfseagrant.tamu.edu/oilspill/pdfs/Shorelines_coastal_habitats_FACT_SHEET.pdf

Additional Sources:

Fisheries Biologist

Your job focus is on the fish populations of the area which includes finfish, oysters, mussels, shrimp and crab that support the aquatic food web. You are actively involved in monitoring the fish populations and looking for signs of the impacts by the oil spill. You are working closely with the wildlife biologist and botanist to identify habitat restoration needs and to decide if shellfish harvest and fishing should be permitted or not, to allow populations to recover. You would welcome assistance from commercial fisherman in monitoring the fishery and areas impacted by oil.

Resources:

'Kayla DiBenedetto's Story'

- http://www.fws.gov/home/dhoilspill/stories/kayladibenedetto.html

Federal Fisheries closures

- http://sero.nmfs.noaa.gov/deepwater_horizon_oil_spill.htm

Hunting and Fishing at the SE Louisiana NWR Complex

- http://www.fws.gov/southeastlouisiana/hunting_fishing.html

Additional Sources:

GIS (Geographic Information Systems) Specialist

Your job focus is mapping the coastal areas that are constantly changing due to erosion and hurricanes. Currently, you are involved in mapping the oil spills projected path and gathering information to map the areas impacted. The refuge staff and the public use your GIS maps. For example, biologists can use the maps to identify habitat types where the oil has had the most impact and to evaluate habitat restoration activities. Currently, the GIS maps are being used to help make decisions about clean-up strategy and monitoring recovery.

Resources:

Mapping Responses to the BP oil spill in the Gulf of Mexico

- http://www.geoplatform.gov/gulfresponse/

Additional Sources:

Refuge Manager

You are responsible for meeting the goals of the refuge to ensure protection for wildlife and their habitat, and also provide visitor opportunities on the refuge. The needs of wildlife must come first. You have to make the hard decisions about opening and closing portions or the entire refuge if necessary due to the spill to protect the wildlife and fisheries from further damage. You have also been active on the overall Incident Command for the oil spill in the entire Gulf Coast region. As the result of serving in that position you are able to answer a variety of general questions about the government spill response and can direct people to where to get more information.

Resources

Career Profile – Danny Breaux

The Spill on the Spill by Jack Bohannan

- http://www.fws.gov/home/dhoilspill/stories/jack.html

Science in Support of the Deepwater Horizon Oil Spill

- http://www.fws.gov/home/dhoilspill/pdfs/ScienceinSupportFactSheet.pdf

Additional Sources:

Contaminants Specialist

You specialize in studying the impacts of pollutants on wildlife and their habitat. Since the oil spill, people often ask you if it is safe to eat the local seafood. Because your focus is on the wildlife, not on human health, you often have to tell folks to follow the recommendation of the Food and Drug Administration, the National Oceanic and Atmospheric Administration and other human health experts about the safety of Gulf seafood. Your main job is gathering information to be used in the Natural Resource Damage Assessment and Restoration Program which will used to assess damage to the environment. This information will be used make sure that the all costs to restore damaged natural resources are incurred by those parties deemed responsible for the spill, at no cost to the American taxpayer.

Resources

'The Spill on the Spill by Pete Tuttle'

- http://www.fws.gov/home/dhoilspill/stories/pete.html

Additional Sources:

Visitor Service Specialist

You serve as the environmental education coordinator, refuge interpreter and media contact. Though you have had to cancel school field trips to the coastal refuges due to the oil spill, you are still visiting classrooms and inviting students to the visitor center. You are interested in working with local teachers to talk about the impact of the Gulf spill on wildlife habitat in the local area. You are answering questions from news reporters about the current status of the spill at the refuge. You are currently designing signs for areas closed to the public due to the oil spill. You've decided that the signs should serve as an opportunity to inform refuge visitors about the environmental impacts of the spill, why beaches and marshes are currently closed, and what people can do to reduce their petroleum consumption so oil spills will be a less frequent hazard to wildlife both in the Gulf of Mexico and elsewhere.

Resources

- Career Profile: Byron Fortier

Additional Sources:

Deepwater Horizon Gulf Oil Spill Mock Public Meeting

Audience Member Roles

You are an audience member at the public meeting. You live in St. Tammany Parish in northeastern Louisiana not far from New Orleans. Conduct research on the local area to more fully develop your role-play and to be able to ask informed questions of the panel. Use the student worksheet to help guide the development of your role.

These websites are a good place to begin your research:

- St. Tammany Parish Community Resources - http://www.stpgov.org/community.php
- Coalition to Restore Coastal Louisiana - http://www.crcl.org/
- Governor's Office of Coastal Activities - http://www.goca.state.la.us/

General Oil Spill Response Information

Restore the Gulf: http://www.restorethegulf.gov

U.S. Fish and Wildlife Service

General Info

- http://www.fws.gov/home/dhoilspill/

Oil Spill Response

- http://www.fws.gov/home/dhoilspill/pdfs/OilSpillFactSheet.pdf

NOAA: http://gulfseagrant.tamu.edu/oilspill/pdfs/Shorelines_coastal_habitats_FACT_SHEET.pdf

Local Family

Your family enjoys the coast, swimming, fishing, birdwatching, and boating. You love the wildlife refuges because of their unique, undeveloped natural environments, teaming with wildlife. You are anxious to get back out and enjoy the coastal area again but worry about your family getting sick from the oily water or the air. You find the oil-stained booms deployed to protect the beach unsightly and depressing and are unsure that they really are working as designed.

Teacher

You are a science teacher. In the past you arranged field trips with your students to visit the refuges to study wildlife biology and wetland ecology. Because of the spill, all of those opportunities have been cancelled for this term. You are wondering about when you might be able to visit the refuge again and if there are any volunteer opportunities for your students to assist in the oil cleanup or to help restore the damaged marshes.

Parish President (similar to a Mayor**)**

The national wildlife refuges are natural gems in your parish. They attract out-of-town visitors and enhance the quality of life for everyone who lives here and or may consider moving here in the future. You are concerned about what the long-term forecast for full recovery of the refuges and the surrounding bay environment.

Hotel Owner

Hunting season is coming up and duck hunters come from all over the Southeast U.S. to hunt at the Louisiana refuges. You are worried about what to tell hunting clients when they call. You want to be able to say to them that they should come on down; that it is safe to consume fish, other seafood and the ducks they will harvest. You are concerned about the future of your business.

Chamber of Commerce

The Chamber is the voice of business at the local, state, and federal levels of government. It provides members with opportunities to come together for monthly programs, committees and annual events while promoting business, addressing issues of common concern, and helping to contribute to the growth and prosperity of our Region by working with our other Chamber coalition partners, legislative representatives and community and civic organizations. You have a members meeting coming up. Your boss assigned you to attend this public meeting so you get the latest information about the impact of the oil spill on local refuges and bays to share at the meeting.

Resources

St. Tammany Chamber of Commerce

- http://estchamber.com/index.htm

St. Tammany One of Nine Parishes Chosen For Federal Economic Assessment of Oil Spill

- http://www.stedf.org/photos/1282767471.pdf

Additional Sources:

Local Birdwatcher

You are an avid birder. You recently got training on how to safely rescue and care for oiled birds and volunteered at the Ft. Jackson Bird Rehabilitation Center for 2 months. Now that aspect of spill recovery is over. You want to continue to help birds and their habitats recover from the spill but are not sure how you can help.

You Tube Video of Bird Rehab Center

- http://www.gulfcleanupfund.org/Videos/Player/TabId/80/VideoId/94/Fort-Jackson-Bird-Rehabilitation-Center-Jun--6-2010.aspx

Additional Resources:

Louisiana Audubon Society

You are representing the Audubon's Great River Birding Trail, a project of the Society designed to attract birding tourists to the region. One of the birding trail sites is at Bayou Savage National Wildlife Refuge. You've come to get an update on the refuge's status and to learn if opportunities to see birds have been impaired by refuge area closures due to the spill. You want to post refuge information on your website to keep birding trail users up-to-date.

Resources:

Great River Birding Trail – Bayou Savage NWR

- http://www.greatriverbirding.org/site/index_new.php?site=1360

Bayou Savage National Wildlife Refuge

- http://www.fws.gov/bayousauvage/

Sporting Goods Owner

You own the local sporting store where local folks and visitors buy their hunting and fishing equipment, including guns, ammo, rods, reels and bait. You just got in a big shipment of ammo, bait worms and minnows for the season and wonder if you will be able to sell any of it. You are concerned about the status of hunting and fishing on the refuge and the future of your business.

Seafood Restaurant Owner

You own a popular local bayside restaurant. You are concerned about the future availability of finfish and shellfish harvested from the Gulf upon which your business depends. You are attending the meeting to find out if there is anything new that the U.S. Fish and Wildlife, FDA, or NOAA Fisheries can tell you about the safety of your seafood product.

Fisherman

You have spent your entire life fishing in the Gulf. You own your own shrimp boat and know the area like the back of your hand. You love the freedom of earning your living as a waterman much like your Cajun ancestors did for generations. The fishing closures due to the spill have kept your boat at the dock, although you were able to earn a little income helping to skim oil using your rig. You are wondering when the fishing closures will be lifted so you can get back to work.

Duck Hunter

Duck hunting season is here. You can't wait to get out and hunt, but your favorite hunt blind out on the refuge is in area closed because of the spill. You are not happy. You are thinking about where else you might go to hunt.

Boat Tour Company owner

Your tour business is based on taking visitors to see rare and unusual birds on remote refuge islands. Since the spill you have been unable to take out any clients. You have been busy helping the authorities pickup oil booms that were deployed to protect bird nesting islands. You are thinking about what other work might be available until you can start taking out tourists again.

Deepwater Horizon Gulf Oil Spill Mock Public Meeting: Student Role Worksheet

Complete the following questions about your assigned role.

1. What is your assigned role? _____

2. Describe your general job or role in the community.

3. List how you are involved in the Gulf oil spill recovery or how you were affected by it, or both.

    a.

    b.

    c.

    d.

4. If you are a panel member, explain your role in the Gulf oil spill recovery as if you are talking directly to the public meeting audience. Write your testimony below.

5. If you are an audience member, write 2 or 3 questions to ask the panel.

Deepwater Horizon Gulf Oil Spill Mock Public Meeting
Definitions

Bioaccumulation: The increase of a pollutant in the tissues of an animal over time.

Biomagnification: The process by which a pollutant increases in concentration as it moves up the food chain.

Botanist: A person that specializes in the study of plants.

Contaminants Specialist: A person that specializes in studying pollutants in the environment and their impacts on fish, wildlife, plants, and their habitat.

Deepwater Horizon Gulf Oil Spill: The drilling platform called the Deepwater Horizon exploded on April 20, 2010, killing 11 workers and injuring 17. The damaged platform sank, leaking an estimated 200 million gallons of oil into the Gulf for more than 85 days.

Delta duck potato: Plant that produces a tasty white tuber, which is favorite food for ducks.

Geographic Information Systems (GIS) Specialist: A person who specializes in using computer software to create and update maps, graphs and other tools that help natural resources managers understand land use and cover, habitat types, wildlife populations, environmental practices, and much more.

Gulf of Mexico: A large body of water bordered to the north by Texas, Louisiana, Mississippi, Alabama, and Florida, to the west by Mexico, and to the southeast by the island of Cuba. The Gulf supports a great diversity of animal life. It is extremely important region for wintering and migratory birds and is very rich in marine life. The Gulf is economically important for the U.S. because of its oil and natural gas industry and commercial fisheries.

Invertebrates: Animals without backbones. In the Gulf of Mexico, examples include shrimp, crabs, oysters and mussels.

Intertidal resources: The small organisms such as mussels, crabs, limpets, and snails that live in the area of the coast that is exposed at low tide and submerged in water at high tide.

Light crude: The oil spilled in the Deepwater Horizon oil spill is classified as light crude. Light crude leaves a film on intertidal resources and can potentially cause long-term contamination.

Marsh: Wetlands that are frequently inundated with water.

Migratory birds: Birds that undertake regular seasonal flights in response to food availability. Some birds make short migrations while others make thousand mile journeys.

Moderator: A designated person at a public meeting that enforces the meeting rules and speaking time limits.

National Wildlife Refuge: A federally designated area managed by the U.S. Fish and Wildlife Service for the conservation and management of the fish, wildlife, plants, and their habitats.

National Wildlife Refuge Complex: A collection of national wildlife refuges in a particular geographic area.

Each refuge is managed individually for its unique fish and wildlife resources but is supervised by the complex headquarters.

Oil booms: Booms are floated in the water to keep oil away from the shore. Absorbent booms are used to collect oil that reaches land. Booms require constant maintenance and repair, and do not work well in rough water.

Oil pipeline: Carries oil from underground to the surface.

Oil platform: The platform is the place at the surface of the water where the oil from the pipeline is collected. From the platform it is shipped to land for refining.

Oil slick: Oil floating on the water surface. It can coat everything it touches in a layer of sticky oil.

Oil weathering: The physical, chemical, and biological changes that occur when oil interacts with the environment. The exposure of the oil to air, sunlight, tidal action, and certain microscopic organisms degrade and disperse the oil over time. Weathering rates depend on the type of oil, weather, temperature, and they type of shoreline and bottom in the area of the spill.

Plankton: Tiny drifting organisms living in marine and fresh water environments that form the basis of the food web.

Public meeting: A formal gathering that addresses an issue or concern of people living in a particular geographic area. People attending the meeting learn about how the issue is being dealt with by authorities and have an opportunity to ask questions and share their concerns and perspectives.

Refuge Manager: A person responsible for the overall management of a national wildlife refuge and meeting the conservation goals for the refuge.

Roseau cane (Latin name - Phragmites): Common reed, a large perennial grass found in wetlands.

Three-square: Another name for Bulrush sedge which is a common wetland plant. Geese will eat the entire plant, while ducks will feed on the seeds.

U.S. Fish and Wildlife Service: The federal agency within the Department of Interior responsible for many of the nation's fish and wildlife resources, and is one of the primary trustees for protection of fish, wildlife, and their habitat from oil spills.

Wetlands: Marshes, bogs, and swamps are examples of landforms that are permanently or seasonally saturated with water. Wetlands are important nurseries for fish and wildlife; they protect inland areas from severe flooding and storms; they act as a natural water filtration system, removing pollutants; they function like sponges storing water and slowly releasing it; and they provide valuable resting and feeding area for migrating birds.