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As part of a continuing effort to save money and better serve readers, the *Fish & Wildlife News* is bulking up its online presentation. It remains available as a free PDF at fws.gov/home/fwn/newspdf.html and is now, on a trial basis, available on zinio.com. The Zinio version is tablet eady and costs \$2.99 per issue. We are also working on more online presentations, so stay tuned.

Each address will be receiving a post card in the near future to update the address mailing list and quantity.

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WHAT ENERGY DEVELOPMENT BRINGS

by SCOTT COVINGTON
and PEDRO "PETE"
RAMIREZ JR.

No screen keeps birds from perching on this vent stack in an oil-water separator at San Bernard National Wildlife Refuge in Texas.

Wrestling with the immediate impacts of oil and gas development comes with the territory for Bill McCoy, refuge manager of the 8,642-acre Patoka River National Wildlife Refuge in Indiana. McCoy struggled to persuade an oil and gas operator to move storage tanks out of a floodplain after the refuge acquired a 200-acre tract where the mineral rights for oil development were privately owned.



In December 2011, floodwaters inundated the area and overran oil storage tanks that the oil company had placed within the floodplain. Flood debris caused a tank valve to remain open and release of up to 15 barrels of crude oil into the floodwaters (1 barrel of oil equals 42 gallons). The floodwaters deposited oil in large patches over the ground, on trees and onto a neighboring property that was part of a permanent wetland reserve easement. The oil company eventually cleaned up the larger patches of oil.

McCoy talked to the oil operator about potential impacts: releases of oil and oilfield brine from the tanks, separators and pipelines or flowlines; storage tank emissions; and chronic oil spills. McCoy's efforts paid off when the operator willingly moved a proposed well site to a farm field and drilled the well at that location. Unfortunately, the oil operator kept the oil storage tanks in the same vulnerable location. McCoy says he "can only hope that the tanks don't leak during the next flood or the operator raises the tanks above flood level."

How can an oil and gas well be punched into the middle of the Patoka River Refuge, let alone into a floodplain? It's all about "split estate," in which the minerals underground are owned by an entity other than the surface owner. In the case of Patoka River Refuge, like many other wildlife refuges, the privately owned mineral rights were retained when the surface rights—that is, the land itself—were sold. The Service cannot deny access to subsurface minerals; that would be considered a "taking of private property," in this case, nonfederal mineral rights.

McCoy is not alone in dealing with split estate and oil and gas issues. Of the 562 national wildlife refuges and 38 wetland management districts, 107 have oil and gas wells and/or pipelines. The vast majority of these wells and pipelines are for exploration, production and transport of nonfederally owned oil and gas.

The problems faced at Patoka River Refuge aren't the only ones that refuge managers and the Service contend with. The Service cannot infringe on the rights of the mineral owner. It can, and does, require that private mineral owners conduct operations in a way that minimizes environmental damage as much as practicable. However, without revising the existing oil and gas regulations, McCoy and other refuge managers have few specific regulatory tools they can apply beyond monitoring, advising and working within the existing regulatory framework, which vary by location. (*See State Regulations: Effective at Protecting Refuges?* p. 19)

And there are a host of issues at each stage of oil and gas exploration and production.

During any phase of oil and gas exploration and production the following problems can occur: loss of public use of refuge areas with oil and gas activities or facilities; chemical and oil spills and leaks; noise, dust, exhaust fumes and human activity caused by equipment and crews disturb and displace wildlife; puddles of leaked oil can trap small mammals and songbirds; and the increase in vehicular traffic usually results in wildlife mortality, especially when transporting the large amounts of water needed for hydraulic fracturing.



A visitor takes in Patoka River National Wildlife Refuge in Indiana.

Exploration for oil and gas brings potential problems. Seismic surveys are one of the most common methods used to determine the potential for oil and gas in the underlying geologic formations. Often, air guns, explosives or vibroseis vehicles (specially designed heavy trucks that “thump” the ground) are used in seismic surveys. Air guns and explosives can harm aquatic organisms such as fish and marine mammals. Vibroseis vehicles, seismic drilling rigs and other heavy equipment can crush vegetation, cause soil compaction and erosion, and change the flow of water in wetlands. Seismic surveys in areas with shrubs and trees require clearing trails for the drilling rigs, vibroseis vehicles and other vehicles, resulting in extensive habitat loss or fragmentation.

Drilling a well typically requires construction of an access road and a well pad (two to six acres or more of habitat is removed) to accommodate the drilling rig and associated equipment. Noise and activity from the drilling rig, support vehicles and drilling crews disturb and displace wildlife. Emissions of various air pollutants including nitrogen oxides, volatile organic compounds, carbon monoxide, sulfur dioxide and particulates from the drilling rig engines, gas flares, and support vehicles can degrade air quality. Nitrogen oxides and volatile organic compounds are primary precursors to ozone formation, which can have damaging effects on vegetation and the health of wildlife and humans. Fluid waste from drilling is often disposed of in earthen pits (reserve pits), which can contaminate ground and surface water. Birds and other wildlife attracted to pits can also become trapped in the oily waste and die.

Horizontal wells drilled in shale oil or shale gas formations typically require fracturing the oil- or gas-bearing rock by injecting large volumes of fluids (water, sand and chemicals) under very high pressure into the well. Hydraulic fracturing operations use 2 million to 5 million gallons of water per well, along with chemicals and acids, which are injected to stimulate production. The use of these large quantities of water for fracking can deplete water sources needed by refuges. After the well is fracked, 10 to 70 percent of the fracking fluid (flowback) flows out of the well and is temporarily stored in either steel tanks or a reserve pit.

Once wells come online and begin producing, oil operators must regularly inspect the sites to detect releases of oil and oilfield brine from the wellhead and pipelines or flowlines. Spilled oil from leaking wellheads or pipelines contaminates soil and can be transported to nearby streams or wetlands by rainfall, runoff or snowmelt. Equipment to pump the oil out of the well can be noisy and disturb wildlife.

At Patoka, McCoy continues to improve communication and provide recommendations to the oil and gas operator on the refuge. Although damage has already occurred, he includes other federal and state agencies in discussions to provide additional support and recommendations on how to minimize further impacts to refuge resources. With additional knowledge about the drainage patterns, upland habitats and drilling capabilities, he encourages the use of best management practices in this oilfield to protect the wildlife and other resources for which the refuge was established. □

SCOTT COVINGTON, Refuge System Energy Program, Headquarters, and PEDRO “PETE” RAMIREZ JR., Refuge System Environmental Contaminants, Headquarters

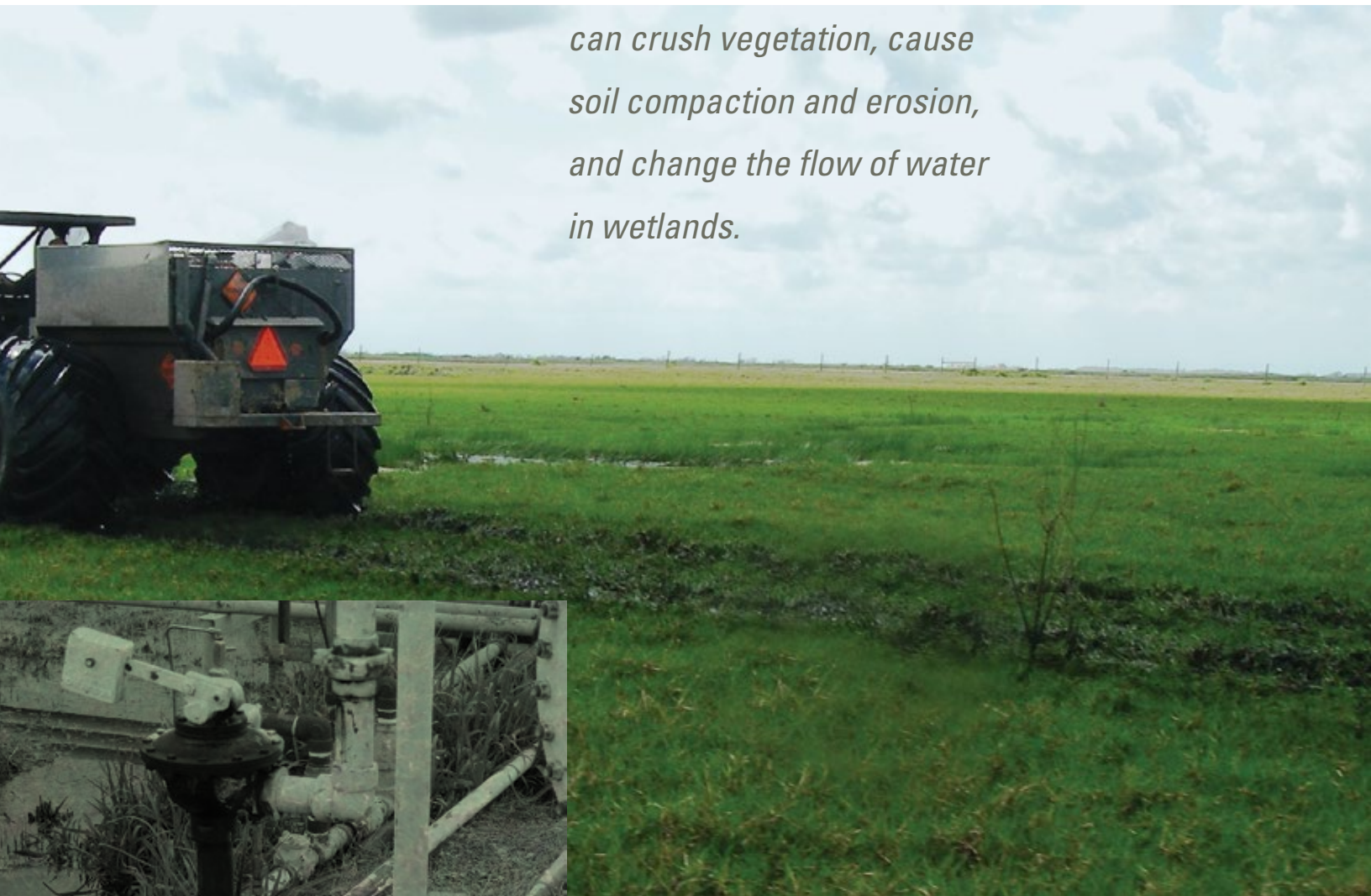


A seismic exploration vehicle leaves ruts on the marsh at McFaddin National Wildlife Refuge in Texas.

MONIQUE SLAUGHTER/USFWS

PEDRO RAMIREZ JR./USFWS

Vibroseis vehicles, seismic drilling rigs and other heavy equipment can crush vegetation, cause soil compaction and erosion, and change the flow of water in wetlands.



Flowlines cross a mudflat at San Bernard National Wildlife Refuge in Texas. Some flowlines are abandoned and corroded.

WHEN THE WELL GOES DRY

Left: These three wells drilled in the 1930s at Lower Rio Grande Valley National Wildlife Refuge in Texas were improperly abandoned in the 1990s and finally properly plugged and abandoned, and equipment removed, in 2010. **Right:** Oil leaks from an improperly abandoned oil and gas well site on Deep Forks National Wildlife Refuge in Oklahoma.

The high price of improperly abandoned oil and gas equipment

by BENJAMIN IKENSON



JO CORTEZ/USEFWS

On the south Texas plains in the fall of 2007, a 28-year-old ranch hand was operating a tractor, moving dirt to thwart the path of a distant wildfire when the tractor hit an improperly abandoned natural-gas pipeline concealed in the brush and burst into flames. The man's hands, arms and face were severely burned. "I thought I was fixing to die," Bo Vavrusa told a Bloomberg News reporter.

To regulators and the oil and gas industry, a properly retired well is referred to as plugged and abandoned. But an improperly abandoned well means operators gave up and are never returning. Abandonment is also used to describe other equipment and infrastructure left behind without restoring the sites.

Bearing scars, Vavrusa survived. But the accident sheds light on an issue that leaves many kinds of scars. In addition to human safety, improperly abandoned oil and gas infrastructure represents a major environmental hazard on lands and waters, especially in the National Wildlife Refuge System. Even long after the business of extraction is finished, oil and gas remains an inherently dirty business. Improperly abandoned pipes and tanks fail and inadequately plugged wells leak, polluting soil and water. The challenges associated with them are both complex and costly.

For example, one of the most biologically diverse areas in the Refuge System, Lower Rio Grande Valley National Wildlife Refuge in Texas is an important wildlife corridor made up of more than 100 Service-owned tracts of land along the final 275-mile stretch of the famed river. On one of the tracts, three oil wells drilled in the 1930s—long before the refuge was

established—were improperly abandoned when their last operator disappeared in the 1990s. The wells were located along a large saltwater lake frequented not only by the general public but by endangered piping plovers and least terns, as well as a host of other wintering shorebirds.

"The production infrastructure extended into the lake and we were very concerned it could contaminate the adjacent wetland, which is also important wintering habitat for piping plover," says Refuge Manager Bryan Winton. "Equipment was left at each location, including storage tanks and rusted pipelines containing chemicals and hydrocarbons. One well was already leaking and the concern was that the wells, if left unplugged and further neglected, would contaminate the entire lake."

The refuge issued numerous requests to the Texas State Railroad Commission—the state agency that



DARRIN UNRUH/USFWS

oversees and permits oil and gas activities—to properly plug and abandon the wells. Like their counterparts in other states, the agency charges fees to operators that are pooled and used for cleanup. “But cleanup costs typically exceed available funding,” says Winton.

After extensive negotiation, the Railroad Commission properly plugged the wells, and removed equipment and pipelines. However, because of access issues, it wasn’t until 2010 that the state finally accomplished the task at a cost of more than \$1.2 million.

“The original well operator sells the wells, and ownership probably changes several times,” says Winton. “As productivity declines, the owner sells off the facilities to another company since they cashed in on the most highly productive years of a well’s life. They leave it up to another company to squeeze out the last drops of oil, passing on reclamation responsibilities to the next company. The new owners are

often lower budget operators with few financial resources to upgrade facilities or clean up when they’re done. They, in turn, sell to someone else. In the end, nobody has the resources to follow through with reclamation.”

As Winton says, it can be very hard to hold operators accountable for the damage they leave behind. They often simply disappear, or can’t afford the cost, choose the lesser expense of bankruptcy and walk away. Refuge staff can negotiate with state agencies, but that can take years and does not always yield results.

In east-central Oklahoma, the 9,600-acre Deep Fork National Wildlife Refuge is home to not only upland prairies, hardwood forests and oxbow lakes, but also hundreds of small, old stripper wells, scores of pump jacks and other surface equipment left behind by oil and gas operators.

“I never dreamed I’d be trying to track down old oil well operators as part of my job,” says Refuge Manager Darren Unruh. “But we are concerned about what’s going on underground. The old casings may be compromised and wells need to be plugged to protect groundwater, but the operators are mostly long gone and the Oklahoma Corporation Commission hasn’t really been able to help.”

And there are more than just a few inactive sites on refuges across the nation.

“Based on current data, the National Wildlife Refuge System has over 5,000 oil and gas wells—about 1,665 are active, the rest are in some state between inactivity and abandonment,” says Pedro “Pete” Ramirez Jr., a Refuge System environmental contaminants biologist. “We’ve got our work cut out for us. We need updated status information on the other 3,000-plus wells. Relatively few have been properly plugged and abandoned, contaminants cleaned up, equipment and pipelines removed, and the site restored to natural conditions by the oil operators. The extent that we can find operators on

the other wells will likely define how much of the cleanup costs will fall to taxpayers.”

The cost and cleanup of improperly abandoned oil and gas infrastructure have been concerns of growing importance over the last decade. In 2003, the Government Accountability Office (GAO) issued a report that determined management and oversight of oil and gas activities on refuge lands was inadequate and inconsistent. The GAO pointed out that the Service needed to inventory oil and gas wells and infrastructure on refuge lands and develop a national tracking system to consistently address problems. The GAO also found refuge regulations ineffective at helping managers deal with oil and gas issues.

“Most improperly abandoned oilfield equipment pre-date refuge acquisition” says Ramirez. “The challenge now is identifying abandoned sites, getting equipment removed and the sites cleaned up.”

Ramirez and his colleagues are compiling information on oil and gas activities across the Refuge System. They are preparing a report documenting the number and location of wells and pipelines across the country. The report will also inform future regulation efforts such as how to establish a consistent approach for permit conditions—and include an approval process and timeline for equipment removal before problems occur.

Also, Ramirez and fellow Service personnel are involved in training activities to better acquaint refuge staff with oil and gas industry practices and to better negotiate with operators. Meanwhile, Service managers and oil and gas specialists are working to educate oil and gas companies operating on refuge lands about conservation needs.

“Altogether, this is an enormously complex, costly and dangerous problem,” says Ramirez. “But we are making decisive steps forward.” □

BENJAMIN IKENSON is a freelance writer living in Albuquerque, New Mexico.

CONSERVATION COMPROMISES



Refuges work with oil and gas companies to find solutions

BY KENDALL SLEE | The thorn forests on Lower Rio Grande Valley National Wildlife Refuge in Texas provide the endangered ocelot with one of its last vestiges of habitat in the United States. Knowing that only an estimated 50 ocelots remain in the United States, refuge managers are concerned that oil- and gas-related pipelines, and roads transecting the forest give the ocelot's dominating competitors—coyotes and bobcats—inroads to one of the species' last footholds.

Egrets fly over an oil well at Hagerman National Wildlife Refuge in Texas.

The ocelot specializes in hunting in dense, almost impenetrable vegetation where larger predators have limited access. This wild feline—twice the size of a house cat—once ranged across Texas, southern Arizona and into Louisiana and Arkansas, but now its only U.S. presence is in the southern tip of Texas.

Lower Rio Grande Valley's thorn forest is transected by pipelines that are periodically cleared of vegetation, threatening to degrade part of the cat's fragile habitat.

As in many aspects of oil field management, the most economical practices to maintain oil and gas pipelines may be detrimental to wildlife.

Oil and gas operators traditionally use herbicides to clear vegetation over pipelines, creating a 10- to 30-foot-wide corridor that reduces the risk of line damage from plant roots and allows monitoring for leaks. Now, Lower Rio Grande Valley Refuge Manager Bryan Winton is reaching out to energy companies that operate on the refuge and beyond to encourage them to mow pipeline corridors. Killing native vegetation with herbicides encourages invasive plants to infiltrate the refuge. Herbicides can also degrade water quality as heavy rains can wash them into streams or wetlands.

Even if operators mow, clearing vegetation remains detrimental to the ocelot because it opens corridors for competing predators.

"There is no permanent solution for pipelines we inherited on refuge lands," Winton explains. "For safety purposes, companies will always have to maintain their lines." He encourages pipeline owners to minimize their footprint in the thorn forest. "If we can get a company with a 50-foot right of way to agree to maintain only 30 feet, then that is a big habitat savings," he says. The refuge requires new pipelines to be routed around high quality ocelot habitat to align with roads or other existing disturbances, even if it takes miles of additional pipeline.

Building Relationships

The complications of managing wildlife alongside oil and gas operations exist on many refuges, and could extend to yet more refuges as oil and gas extraction technologies evolve. While the Service owns and manages the land on most national wildlife refuges, in many areas the mineral rights—the right to extract the below-surface oil, gas and minerals—are owned by private parties, says Mary Maddux, Service regional oil and gas specialist at Hagerman National Wildlife Refuge in Texas. In fact, on a number of refuges in Texas and Louisiana, oil and gas drilling was underway when the refuges were established.

“If you’ve spent decades trying to improve a habitat and an oil and gas operation comes in to drill, they can annihilate that area.”

—MARY MADDUX, Service oil and gas specialist

What is particularly difficult, Maddux says, is that state laws give mineral rights legal priority over surface rights. That gives mineral owners the right to construct roads and well pads, to drill wells, and to install pipelines and storage tanks to access those minerals. That can leave refuge managers, who have few specific regulatory protections, in a climate of stark conservation compromises. "If you've spent decades trying to improve a habitat and an oil and gas operation comes in to drill, they can annihilate that area," Maddux says. "It makes it hard to plan your conservation objectives, because you don't know where they're going to develop oil and gas in the future."

Experiences vary by state, refuge and company. States vary on how they regulate oil and gas as they do in the strength of their environmental protections.



Above: Only an estimated 50 ocelots remain in the United States, and now it is being further threatened by the removal of its habitat to clear space for pipelines.

Right: Discarded pipes sit on a well pad at San Bernard National Wildlife Refuge in Texas.



Additionally, it is easier to start on the right environmental footing with an oil and gas company rather than fix situations decades later. Moreover, oil and gas companies also operate with varying degrees of environmental consciousness.

Billy Leonard, oil and gas specialist for Southwest Louisiana Refuge Complex, says that the complex has been able to work with mineral owners on the specifics of how they access oil and gas. “In some cases we have had them drill off-refuge to get to minerals that are under the refuge. In one case, a producer built his entire production facility off-refuge,” he says.

Furthermore, the large company that owns most of the mineral rights on the refuge has spent time, funding and effort in restoration, Leonard notes. In 2013, for example, the company worked with refuge management to create a 20-acre wetland on a former road and drilling area no longer in use; the company routinely restores and improves refuge roads damaged by heavy industrial equipment.

Sabine National Wildlife Refuge, part of the complex, is designated a Globally Important Bird Area due to the numerous wading, water and marsh birds that use it throughout the year—some alongside oil and gas wells. Leonard encourages open lines of communication about spills, drips, leaks and equipment malfunctions because fast action can save habitat and mean lower cleanup and restoration costs for operators.

“There are mistakes made and mechanical breakdowns. I advise them on what needs to be done,” he says. “If soil has been contaminated by a leak, we have the

operator replace contaminated soil before allowing them to continue their work.”

When oil spilled from a tank onto marsh grasses during the 2005 Hurricane Ike storm surge, Leonard advised the responsible party to promptly mow and remove all the affected vegetation. The company followed his advice, helping to prevent marsh birds from moving through the vegetation, getting oil on their plumage and ingesting it.

Such an approach is the result of years of building trust by working with oil and gas companies to address problems, and in a state with reasonable regulations.

Finding a balance

In some oil fields, brine or saltwater is produced along with oil and must be managed and disposed of by the oil operator. Brine spills can be more lethal to refuge habitat than an oil spill. Brine causes long-term damage to soil and kills vegetation. On Hagerman Refuge, a brine spill killed a half-acre of woodlands including some 100-year-old trees that were important to migrating songbirds and other wildlife. The responsible party has agreed to replant and maintain pecan and oak trees in a new location, although the refuge did not regain the 100 years it takes to replace the habitat.

Hagerman Refuge has tightly restricted operator access to drilling platforms that jut into Lake Texoma, where endangered interior least terns nest. Volunteers and oil and gas operators help monitor the nests, and noisy and disruptive activities on the platforms are delayed until after September to minimize disruption to the birds.

Because many migratory birds overwinter on Sabine Refuge, Leonard advises oil and gas operators to wait until after March to undertake drilling and other activities that can be particularly loud and involve heavy equipment.

Remedies

The Service has made progress on a number of fronts to better address the complicated challenges of managing oil and gas on refuges. These include:

- Hired several regional and national oil and gas specialists to give technical assistance to national wildlife refuge field staff and help develop national guidance.
- Developing a national database of oil and gas wells and other structures that are now on refuges.
- Trained 162 refuge and supporting staff on oil and gas operations, Service policy and ways to improve management practices since 2005.
- Issued a Service handbook on management of oil and gas on refuges in 2010.

“Much more needs to be done to address the challenge,” says Kim Trust, Refuge System chief for Wildlife Resources. “The Refuge System is examining the environmental effects of oil and gas activity on refuge wildlife and habitat, reviewing state oil and gas regulations, and seeking to improve the Service’s regulations for management of oil and gas on refuges.” □

KENDALL SLEE is a freelance writer near Syracuse, New York

Spill Has a Happy Ending

by JOHN PANCAKE

On April 6, 2010, a petroleum company work barge anchoring itself for the night punched through a 10-inch oil pipeline. An estimated 400 barrels of oil gushed over the soft Louisiana mud of Delta National Wildlife Refuge before the leak was contained.

Delta Refuge is a watery expanse of 49,000 acres where the rich waters of the Mississippi River Delta meet the warm currents of the Gulf of Mexico. Its vast marshes shelter hundreds of thousands of migratory and resident birds—ducks and snow geese as well as coots, moorhens, wading birds and shorebirds. The shallows teem with game fish, crustaceans, alligators and fur-bearing mammals. It also has roughly 450 oil wells, of which 40 are active, and untold miles of crisscrossing production and flowlines.

Chevron Pipeline Co., which then owned the pipeline—took immediate, appropriate actions to clean up the oil from refuge marshes. But the spill also offered Delta Refuge the opportunity to discuss marsh restoration with Texas Petroleum Investment Co. (TPIC), the largest oil and gas operator on the refuge. TPIC was responsible for multiple small spills in other parts of the refuge.

Ultimately, a \$100,000 grant from the National Fish and Wildlife Foundation (NFWF) to the Friends of Louisiana Wildlife Refuges was combined with other funding—including remediation obligations from both Chevron and TPIC—to create a cost-effective \$820,000 marsh restoration project. Both Chevron and TPIC worked with refuge management to address long-term mitigation for the loss of marsh use.

Barret Fortier, wildlife biologist and energy specialist for the Service's Southeast Region, notes that instead of paying the Service mitigation money to cover damages from the spills, the oil companies did much of the work, including hiring the contractors. Volunteers and members of the Friends group added their muscle as well. Working with all entities gave the refuge "much more bang for our buck and gave us a functioning project that has the potential to create new marsh for years," according to Fortier.

Contractors dug a channel six feet deep, 100 feet wide and 800 feet long to divert water into a shallow open area of marsh. They constructed 12 terraces to slow the flow of water, causing sediment to fall out and creating new wetlands. Volunteers planted terraces with smooth cordgrass, a native marsh species.

Over time, the area will become fertile mudflats and marshes, or "mini-deltas."

Jim Schmidt, a retired hospital administrator who is past president of the Friends group and presently the group's treasurer, says collaborating with the oil companies made the work a lot easier. Schmidt, who lives in nearby Slidell, Louisiana, was closely involved in getting the \$100,000 grant from NFWF for some construction and purchasing cordgrass plugs. He's happy with the result.

"We did the planting in June, and I can't believe it but the grass is now over my head out there," he says. "It's going to help us build some super habitat."

Refuge Manager Neil Lalonde, who provided \$40,000 in refuge funds, adds, "Working with and monitoring oil and gas operations is time consuming, but the operators generally are more proactive than in past years in doing the right thing environmentally." □

JOHN PANCAKE is a freelance writer who lives in Goshen Pass, Virginia.



Refuge Manager Neil Lalonde is pictured in October on a vegetated terrace of Delta National Wildlife Refuge in Louisiana.

State Regulations: Effective at Protecting Refuges?

by SCOTT COVINGTON and PEDRO "PETE" RAMIREZ JR.

Mark Cupit, refuge law enforcement officer at St. Catherine Creek National Wildlife Refuge in Mississippi, has investigated numerous oilfield leaks and spills during his career. Consider just one example.

In 2009 he found a poorly plugged well leaking oil onto the refuge. After consulting refuge and state records, he found no company liable because the operator had long ago improperly abandoned the site. This orphaned well cost approximately \$260,000 to "plug and abandon" (where a well is sealed and protected from future leakage), and clean up the site. But in Mississippi, oil and gas companies are required to post only \$10,000 per well as bond, or \$100,000 for a blanket bond that covers all operations by a single operator. In this case, the American taxpayer paid the entire cost of spill cleanup and re-plugging the well.

In general, state regulations are designed primarily to protect groundwater, surface water, human health and safety while also encouraging oil and gas production, minimizing waste of oil and gas resources and maximizing revenues from production. State oil and gas regulations typically do not provide adequate protection for wildlife and its habitat. Of the 43 states that have oil and gas regulations, all have requirements for properly

abandoned wells, but no state has adequate bonding requirements to properly plug and abandon a well, remove the equipment and fully reclaim the site.

Regulations vary considerably from state to state, leaving the oil and gas industry with no consistency for operations on national wildlife refuges. For example, some state regulations address impacts or damage to surface land owners; some do not. Some afford stronger protection to sensitive areas such as wildlife management areas; others do not. Some states address the use and closure of open pits; other states do not. Bond requirements, oil spill cleanup and reporting and fines differ considerably, as does the frequency of inspections of oil and gas exploration and production sites. And states may not have enough inspectors to ensure companies are meeting state standards.

In 2011, the Texas Railroad Commission (which oversees oil and gas operations) reported 153 inspectors to monitor 263,233 producing oil and gas wells. Even to visit each well once a year would require inspectors to visit seven wells a day, which is hardly possible with travel times, not counting vacation, holidays, drilling operations, injection wells or return visits to follow-up on violations. A year between visits is thin to ensure compliance with state standards, and other states have fewer inspectors per well than Texas.

The Service's legal mandates and regulatory requirements differ considerably from the states' missions and responsibilities. The Refuge System's mission is to administer a national network of lands and waters for the

You can see roseate spoonbills at St. Catherine Creek National Wildlife Refuge in Mississippi, which has been designated as an Important Birding Area by the National Audubon Society.



Spilled oil at a production facility at Lake Ophelia National Wildlife Refuge in Louisiana.

conservation and management of wildlife and plant resources and their habitats. So, how can the Service meet its congressionally mandated mission while addressing oil and gas issues that state regulations and inspections do not?

"It would help if refuge staff could enforce state regulation on oil and gas operations on refuges while ensuring compliance with current federal regulations," according to the Refuge System's Chief of Policy Paul Steblein. As it stands now, Service staff can do little but monitor operations, offer advice and talk with state regulators. But as Steblein says, "state regulations by themselves are not sufficient to protect the public's investment and enjoyment of wildlife and wetlands on refuges."

The Service is developing a number of tools, including regulations, to improve its management across state lines and guarantee the American people that wildlife comes first, even as those who own the oil and gas surface rights on refuges continue to provide needed energy resources for the nation. □

SCOTT COVINGTON, Refuge System Energy Program, Headquarters, and PEDRO "PETE" RAMIREZ JR., Refuge System Environmental Contaminants, Headquarters

