

**Report to the Membership of the
North Dakota Chapter of The Wildlife Society**

**Observations and Recommendations to Reduce Fish
and Wildlife Impacts from Oil and Gas Development**



December 2011

Cover photo: Oil well on the Killdeer Wildlife Management Area, McKenzie County,
North Dakota

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Executive Summary: Several members of the North Dakota Chapter of The Wildlife Society traveled to northwestern North Dakota, June 3-5, 2011, to observe impacts from oil and gas development on fish and wildlife and natural resources. Tour stops included Lake Ilo National Wildlife Refuge managed by the U.S. Fish and Wildlife Service, Killdeer Mountain, Lewis and Clark, and the Hofflund Wildlife Management Areas managed by the North Dakota Game and Fish Department, lands managed by the U.S. Army Corps of Engineers, and private lands. We met with state and federal fish and wildlife biologists and refuge managers, industry personnel, and private landowners to look at oil impacts and issues. This report documents our observations and includes recommendations to develop a state comprehensive strategy to avoid, minimize, and mitigate environmental impacts from oil and gas development, provide for more comprehensive review of permit applications, set up research and baseline environmental studies, protect surface owner's rights, provide for more inspectors and stricter enforcement of state regulations, and coordination between state agencies. We believe these recommendations are necessary to conserve and protect the state's natural resources and outdoor heritage. Further, we believe that through a comprehensive strategy, these recommendations can be implemented without unduly restricting energy development and production.

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Introduction to Oil and Gas Development Issues:

The oil and gas industry is part of one of the three pillars of North Dakota's economy; agriculture, energy, and tourism. Presently, the booming oil and gas industry is helping to make North Dakota one of the few states with a growing economy and a budget surplus.

Recent data show that oil and gas contributed \$ 12.7 billion to the state's economy in 2009 (ND Petroleum Council). For 2010, an estimated 112.5 million barrels of oil were produced in North Dakota (Department of Mineral Resources). At a rough estimate of \$90/barrel, this represents over \$10 billion in crude oil sales last year.

According to figures presented during the 2011 legislative session, North Dakota had 5,500 oil wells in 2009, and approximately 1,900 wells were drilled in 2010. Projections are for 2,000 wells/year to be drilled over the next 10-20 years. Methane/natural gas has been discovered in 52 of the state's 53 counties. Clays and sands suitable for hydraulic fracturing (fracking) proppants have been discovered in the Hebron and Richardton area, and may be mined for use in the state and for export.

During the regular and special sessions of the 2011 State Legislature, hundreds of millions of dollars were appropriated for road and infrastructure repair and development in the oil patch. Up to several hundred million dollars of oil and gas extraction tax funds were also appropriated for other projects and purposes. No oil and gas funds were appropriated for conservation or restoration of habitat or natural resources.

The oil and gas industry is big business in North Dakota and contributes to the state's economy and the energy needs of the entire country. But the oil and gas industry is also negatively affecting the other two major components of the state's economy; agriculture and tourism, as well as our natural resource heritage. As the dominant estate on both private agricultural lands and public lands, oil and gas development degrades or negatively impacts both agricultural production and natural resource based tourism. Well pads, roads, tank farms, and other infrastructure remove land from agricultural production and may limit or reduce production in the vicinity of developments. The state's tourism industry is based on natural resources such as abundant fish and wildlife populations, clean air and water, and scenic wildlife and landscape vistas. There are over 200,000 North Dakota sportsmen and women who fish and hunt in the state. Countless other outdoor recreation enthusiasts observe and photograph wildlife and hike and venture into the state's scenic lands. An industrial landscape dominated by oil wells, tank farms, pipelines, natural gas flares and fumes, and a scarred landscape are not conducive to outdoor recreation and tourism.

Summary of the North Dakota Game and Fish Department Oil and Gas Report: Potential Impacts of Oil and Gas Development on Select North Dakota Natural Resources, May 2011; A Report to the Director

The Game and Fish Department (GFD) report was prepared in June 2010 and released in May 2011. The report summarizes wildlife research in oil and gas affected areas in other western states and projects potential impacts on ten wildlife species, waterfowl, nongame birds, aquatic resources, and natural resource users.

The report's introduction states "huge financial gains from energy production cannot be expected without having negative impacts to North Dakota's two major industries, agriculture and tourism. As the footprint of oil development expands and the cumulative impacts to natural resources such as water supplies and wildlife habitats increase, maintaining the sustainability of our rich natural resources will become increasingly challenging." The introduction concludes "large scale development often adversely impacts fish and wildlife resources which are a vital part of our huge tourism industry. If future energy development occurs at the expense of our (sic) fish and wildlife resources, large losses in tourism dollars can be expected and the quality of life our residents are accustomed to will be diminished."

Mule deer: The report cites 75 percent declines in ungulate migration for mule deer, elk, and pronghorn as a result of long-term human caused habitat fragmentation. Studies in Wyoming documented a 47 percent decline in mule deer densities over a four-year period in oil development areas compared to nondevelopment areas.

Bighorn Sheep: The report cites ND Department of Mineral Resources data that up to 5,990 new wells could be drilled in bighorn range in the next ten years.

Pronghorn: Pronghorn are most affected by the indirect impacts of road, infrastructure development and disturbance. In Wyoming, pronghorns avoided denser oil well fields with significant activities. The level of increased oil and gas activity projected by the Department of Mineral Resources will likely reduce the effectiveness of habitat for pronghorn in the northern Badlands.

Elk: Elk avoid roads and active oil and gas sites, usually staying more than a mile from such activity. In North Dakota, much of the elk habitat is on public land along the Little Missouri River. Further development will degrade habitat quality for elk, reduce the quality of outdoor experiences, and make it unlikely that current elk populations can be sustained.

The report states that the jobs and revenue associated with the oil and gas industry could come at a very high cost; namely, diminished hunting and recreational opportunities through the loss of primary habitat that sustains the wildlife populations that are so highly valued by the state's citizens due to direct and indirect effects of oil and gas development.

North Dakota Chapter of The Wildlife Society, Oil and Gas Tour, June 3-5, 2011

During the Chapter's 2011 annual meeting in Mandan, there were several presentations on the rampant oil and gas development in western North Dakota. Several Chapter members proposed an onsite trip to the "oil patch" to see for themselves what was happening and what had changed since the last time they were out west, whether it be the Badlands and National Grasslands (U.S. Forest Service), Theodore Roosevelt National Park, the Little Missouri River, various Game and Fish Department areas such as the Killdeer Wildlife Management Area (WMA), Corps of Engineers lands along Lake Sakakawea, and the prairies and potholes of the northwestern part of the state near Stanley and Lostwood National Wildlife Refuge (NWR). Local wildlife managers and biologists volunteered to show those on the tour examples of what was happening to wildlife and natural resources and to public lands.

Out of these informal discussions and subsequent planning, Chapter members traveled through the oil patch on June 3-5, 2011. The group traveled approximately 700 miles to Lake Ilo NWR, Killdeer WMA, the CCC Campground (U.S. Forest Service), Lewis and Clark WMA, Hofflund WMA, U.S. Fish and Wildlife Service (FWS) areas near Lostwood NWR, and private lands near Stanley, ND.

Our thanks to all those biologists, managers, and private landowners who gave of their time to share the weekend with the tour.

OBSERVATIONS:

Lake Ilo National Wildlife Refuge: Lake Ilo is a 4,033-acre refuge in Dunn County, located on Spring Creek and Murphy Creek, tributaries of the Knife River. The refuge, managed by the FWS, is a locally popular fishing and picnicking area, with several privately owned lake cabins on in-holdings along the lakeshore. The recent oil development in the Lake Ilo area all happened within the last three years.

SE¹/₄ of section 20, T. 145 N, R. 94 W. (Easement portion of refuge; FWS has only water and hunting rights; land is privately owned.) An oil company drilled a well along Spring Creek. FWS and BLM recommended moving the well pad away from the creek and using a closed loop system rather than a reserve pit to minimize pollution into the refuge and Spring Creek from any potential spills. The oil company did not accept either recommendation.

SW¹/₄ of section 34, T. 145 N., R. 94 W. The well was drilled off refuge in SE¹/₄. The FWS and BLM made recommendations to the Oil and Gas Division to protect and allow development of the federal minerals under the refuge. The Oil and Gas Division chose not to accept the federal recommendations.

Killdeer Wildlife Management Area: The Killdeer WMA includes approximately 7,050 acres in Dunn County, owned and managed by the Game and Fish Department. The Killdeer WMA, referred to as the gem of the WMA system, goes from the Little Missouri River, up through Badlands topography, native prairie hilltops, and oak and aspen woody draws on the south Killdeer Mountains. The area is home to elk, mule and white-tailed deer, antelope, pheasants, turkey, ruffed and sharp-tailed grouse, beaver, and a variety of other furbearers and nongame species.

The western portion of the WMA has a new oil company road, one new well on the WMA and two wells on neighboring lands, and two new pipelines. The portion of the WMA wintered 63 elk in the winter of 2009-10. After well construction, no elk wintered there in the winter of 2010-11.

The Game and Fish Department owns the mineral rights on one-quarter section (160 acres) of the WMA. They did lease the mineral rights and received a payment into the oil and gas fund within their Game and Fish Fund. GFD receives no general fund tax dollars. They also received a surface damage payment for the oil pad, the road, and the pipeline crossing. The drawback to the surface damage payments is that they do not replace the elk or deer, the habitat lost, or the impacts from continued disturbance. The new oil company road replaced a low traffic public “two-track trail” on the WMA.

There are several thousand acres in the “primitive” area on the western side of the WMA. There is oil development interest in several new wells for this portion of the WMA.

Another well was proposed and staked on the east side of the WMA. During negotiations with GFD staff, the oil company decided to move the well pad about two miles south and horizontal drill to reach the oil on/under the WMA. While the move reduces impacts to the WMA, the well site and very steep resultant road through the aspen woodlands on private land probably had more of a negative environmental impact than the site on the WMA.

Time is money in oil development. The companies have to develop their lease or lose it if not developed within three to five years. It is easier to write a check for surface damages for the pad and road, usually five-seven acres, than to delay or amend an approved lease and drilling permit in order to relocate the well after permit approval.

CCC Campground: (along Highway 85): This was an over-night camping experience along the Little Missouri River. Although not an oil well site, a 3:00 a.m. observation included heavy, consistent semi-truck traffic on the highway and light from gas flares on the skyline to the west, northwest, north, northeast, and southeast.

Lewis and Clark WMA: The Lewis and Clark WMA includes 12,151 acres along the Missouri River/Lake Sakakawea in McKenzie County, owned by U.S. Army Corps of Engineers, and managed by the Game and Fish Department. This area is on the headwaters of Lake Sakakawea, depending on how far water in the reservoir backs up to the west. The WMA wintered 73 moose in 2009-10 and 65 moose in 2010-11. In the past, up to 79 bald eagles have been observed roosting and feeding on winter-killed fish during spring migration.

The area also has nine active oil wells, all flooded this spring (photo 1). Most of the oil companies pumped out most of the oil before the flood and then partially filled the tanks with fresh water to prevent them from floating away during the high water event. After the flood, they will drain the tanks, hopefully not to the river. There are currently seven permit applications for seven more new wells on this area. In July an oil storage tank did tip over and create an oil spill on the COE lands above the WMA and into Lake Sakakawea and the Missouri River.

This is the fourth time in the past 20 years that major portions of the Lewis and Clark WMA has flooded.

On the WMA, in approximately Section 20, T. 153 N., R. 102W, well No. ST1-19 had water within the berm protecting the well. Whether it was rain water or seepage water was impossible to tell, but the company was sump pumping the water and whatever chemicals were on the surface of the pad directly into the Missouri River/Lake Sakakawea (photo 2).

Hofflund WMA: The Hofflund WMA, 1,558 acres, is owned by Corps and managed by the Game and Fish Department. The WMA was home to one old well from the 1970s. It played out, the well was removed, and the well pad was reclaimed. Then along came the Bakken play and horizontal drilling down 10,000 feet under Lake Sakakawea, and the Hofflund WMA went back into the oil business. Now the site has a single “mega-pad” with three wells (photo 3). The WMA was isolated and hard to get to and home to mule deer along the breaks and pheasants along the backwaters of the Lake. Now there is a new road into the area, though still difficult to get through with all the “big” trucks hauling scoria from a new 300-acre scoria pit on private land next to the WMA. The oil company employee warned us to be careful around the trucks “because they weigh 160,000 pounds and don’t have good visibility.” We observed pieces of black plastic scattered and partially buried along the north and west side of the pad, presumably pieces of the buried reserve pit liner (photo 4).

The mega pad had flooded from runoff, so the berm was breached and all the water and whatever else that was on top of the surface or left over from the reserve pit was drained into the Missouri River. During our tour the berm was being raised to prevent flooding from the rising water levels in Lake Sakakawea.

The unaided view of the south shoreline of the Missouri breaks and bluffs seemed to be the “old” North Dakota, wooded coulees and native prairie extending down to the reservoir’s edge. That is until we scanned the horizon with binoculars and found a row of well pads, tank farms, and natural gas flares as far as could be seen along the south shore.

White Lake, Mountrail County: White Lake is a large, several thousand acre privately-owned alkali lake about four miles northwest of Stanley, ND. The U.S. Fish and Wildlife Service has designated White Lake and a 500-foot buffer around the lake as “critical habitat” for the threatened piping plover. Data provided by the FWS indicate 55 plover pairs have nested along the shore of the lake between 1994-2008. High water levels this year (2011) have eliminated nesting habitat on the normally alkali, gravel shorelines. We observed two piping plovers along the gravel road, probably seeking nesting site on the roads because the lake is too high this year.

There is an abandoned well pad on a dry well from the earlier oil boom (1970-80s) located in Section 34, T. 157 N., R. 91 W., along the north shore of the lake. It is within the critical habitat designation. Recently an oil company has proposed converting the dry well into a saltwater injection well. The site is just uphill from a section of shoreline that has a history of piping plover nesting. Across the lake to the west, in approximately Section 6, T. 156 N., R. 91 W., another saltwater injection well is located. There are no public land management interests on or along White Lake. Critical habitat designation does not prevent oil well or salt water injection well development in habitat impacted by development or that would be impacted by any oil or salt water spills.

The Lostwood spill: Located in the NW¼ of Section 34, T. 158 N., R. 91 W., the Afseth 34-3 #1H well was drilled in 2010. The tract is covered by a FWS wetland easement, but easements are subject to mineral rights. The oil company built the well pad and reserve pit over a quarter acre “protected” wetland and next to an intermittent natural waterway. During spring runoff on April 19, 2011, the creek overflowed the well site and the open reserve pit and flowed downstream. The spill was reported and a day later after runoff all but quit, the company placed boom materials in the drainage. The creek and its vegetation were covered with oily residue with a crude oil smell. In June on the tour, the berm on the well pad was still breached and any rainfall or any stream runoff could flow offsite. The well pad is located less than two miles upstream from the Martinson WPA and Lostwood NWR. This is an example of a location that should not have been approved as a well site. While it may have been difficult to avoid wetlands on the easement, the well site could have been located away from the creek/waterway and avoided a spring or heavy rainfall runoff event.

Campsite, private land: SE¼ of Section 35, T. 158 N., R. 91 W. We camped with friends on the night of June 4, 2011, at their home on an idyllic, old farmstead with old, well-maintained red barns. A new house with geothermal heat source is surrounded by old established shelterbelts. A new oil well is being drilled 1,000 yards southwest of the house, with a permit for a second well 500 yards south of the house. So much for quiet,

country living. After dark, we hiked up to the top of a hill along the driveway. The home is surrounded by natural gas flares. Although some hills got in the way, we counted 17 natural gas flares from the hilltop. Truck traffic on Highway 8 was nonstop, even well after dark.

Private Land Well site: Located in NW¼ of Section 17, T. 158 N., R. 89 W., this well site is on private land. The landowner purchased the property (without the mineral rights) in 2004. An APD permit was approved in August 2008. The well was developed in 2008-09, and oil production started in September 2009. Before drilling started, the landowner was offered \$ 8,000 for surface damages. The payment contract wording would also have released the company from any present or future liability or any additional damage payments. The surface owner declined the money. The reserve pit was buried within one year of the permit. The surface owner asked that the pit be removed from the property. The company refused and was supported by the Oil and Gas Division. The pit was covered with about four feet of soil and was farmed in 2010. The pit measures 160' x 60' x 14' deep, pretty standard size for a reserve pit. The surface owner had Missouri Valley Testing, Bismarck, ND, test the reserve pit contents. It contains benzene, toluene, xylene, all carcinogenic compounds, as well as diesel fuel and cadmium. The chemical analysis cost \$ 2,000. Removal and reclamation of the estimated 2,000 tons of toxic waste in the pit would cost \$194,000. The current landowner knows the approximate location of the buried pit, but there is no "official" recording of the pit's location for future owners. This is the case with most buried reserve pits.

The tract of land has a FWS perpetual wetland easement, a USDA Wetland Reserve Program 30-year easement, and a Game and Fish Department Private Land Open to Sportsmen (PLOTS) contract (photo 5). Three layers of state and federal land protection do not hinder or restrict oil development.

Fish Kills and Spills:

In addition to the sites visited on the tour, we had several presentations on the impacts of various oil well incidents that had occurred prior to the tour.

Short Creek Fish Kill, 2010: Short Creek Dam (100-acre reservoir) and WMA (131 acres) near Columbus in Burke County, has historically been a fairly good sport fishery for walleye, perch, and northern pike. The impoundment, heavily used by local residents, suffered a complete fish kill in July 2010 (photo 6) as a result of a total loss of dissolved oxygen (DO) that lasted from the first part of July until mid-September. Most DO sags are short-lived, lasting only a day or two until wind and wave action re-oxygenate the water column. Oil activity was intense in the 1970-80s in the Beaver Lake-Black Slough complex about eight-ten miles upstream from Short Creek Dam. There are six abandoned wells and reserve pits located on and next to the Beaver Lake WPA and many more wells located throughout the Short Creek watershed. There was also a saltwater injection well on the Beaver Lake area. When saltwater was being injected into the

saltwater well, it was documented as upwelling within the Beaver Lake-Black Slough wetland complex. Vegetation upstream from the dam, but downstream from the Beaver Lake-Black Slough complex, was killed during the 2010 fish kill, not typical of a DO event. The State Health Department theorized that the fish kill and vegetation die-off was caused from water from a coal seam in an abandoned mine. However, coal mines/seams have been present in the area for 50-100 years. Rainbow trout, very susceptible to any water born pollutant, are stocked by the Game and Fish Department and thrive in abandoned coal mine lakes (Baukol Noonan Dam, Wilton Mine Pond, and Custer Mine Ponds).

Ray, North Dakota Spill, 2011: A reserve pit spill occurred near Ray in Williams County during spring runoff in 2011. The well and reserve pit were located in the S¹/₂ of Section 8, T. 156 N., R. 97 W. Most of the section slopes south toward the well site. Runoff from heavy snow this spring flooded the well site and still open reserve pit, continued to flow down the slope to Highway 2, and then down the highway ditch into Ray Reservoir at the edge of town. Luckily, there a south wind kept most of the spill from going further into the lake and town (photo 7).

Although these sites had been on our tour itinerary, clean-up activities were already complete in June 2011, and site visits would not have been as informative as slide, map, and data reviews of the incidents.

DISCUSSION POINTS:

Throughout the tour, the wildlife managers and biologists discussed oil and gas impacts and issues that they deal with apart from the specific sites visited on the tour.

Work load: Whether refuge manager, district wildlife manager, fisheries or wildlife biologist; oil and gas work consumes 50-75 percent of their work schedule. This added workload above their current job description, written long before oil and gas development, results in little more than lip service to important natural resource management duties. This is 50-75 percent of the day not spent conducting needed wildlife or habitat surveys, working with cooperators on prescribed grazing or haying or food plots, conducting prescribed burns, planting trees or grass, developing private land agreements with landowners, or talking to wildlife clubs or the general public. The oil and gas business is a 24/7 operation, so the workday is no longer 8 a.m. to 5 p.m., five days a week. It's whenever the oil company calls. The agencies, whether state or federal, have not increased staff to deal with the huge increase in workload.

The oil business is a vast business, there are over a hundred businesses involved in the drilling and production of an oil well; from the well driller, to the utility company routing power to a site, to the trucking companies, the equipment and supply vendors, to the fast food industry. While the state or federal wildlife land manager usually negotiates a permit or agreement with the oil company or lease holder, there are many subcontractors

who have to be met with and informed about the permit conditions and the area to be developed. In case of a mistake, the oil company blames the subcontractor, and the subcontractor says no one told them about limits or restrictions or where to drive, dump or dispose of something. There is no clear chain-of-command or line of responsibility to see that permit conditions or state regulations are followed.

The big increase in population has led to increases in the numbers of hunters, fishers, and other outdoor enthusiasts, all competing for a scarcer resource. There are issues with misrepresentations on resident hunting and fishing licenses.

Big game/vehicle accidents--in some local areas it is thought that vehicle accidents are taking more big game than hunters. Big game and oil vehicle collisions go largely unreported because semi-trucks with cowcatcher bumpers are not affected by hitting a deer. So these wildlife collisions usually are not reported to the insurance company or to law enforcement. This additive mortality is not currently considered in setting big game license numbers and seasons.

RECOMMENDATIONS:

As a result of what we saw and learned on the energy tour, there is plenty of evidence and applicable scientific study to show that the state needs a comprehensive strategy to address the impacts from oil and gas development on fish, wildlife, and natural resources. We believe there are many practical adjustments that can be made to activities in the oil patch that are compatible with the industry and that would lessen the impacts to the land and wildlife resources. The development of oil and gas currently underway is clearly having an impact on the state's wildlife and natural resources. The following recommendations address possible legislation, administrative rule making, or agency policies to address the environmental consequences of the current oil boom.

General:

- 1) First and foremost, the Chapter recommends and requests that the state of North Dakota quickly develop and follow a comprehensive strategic plan for oil and gas development. Such a plan must account for the concurrent development of all the human and social, as well as natural resource infrastructure and development that needs to occur concurrently with oil and gas development and production. The state must see that agricultural and natural resource values are not trampled in the haste to develop an oil and gas resource that is not going anywhere. All the state agencies that deal with energy, agriculture, and social programs that are affected by oil and gas development must be involved in developing and implementing the needed safe guards. This would include the Department of Mineral Resources, State Water Commission, State Agriculture Department, Department of Transportation, Public Service Commission, Game and Fish Department, and possibly other agencies. The U.S. Forest Service has Best Management Practices

and the Bureau of Land Management has recommended guidelines for oil development that could serve as starting points for policies or regulations that could be used to protect wildlife and natural resources on state and private lands.

Wildlife and Natural Resources:

- 2) We recommend that the Department of Mineral Resources and the other involved state and federal agencies strongly enforce existing regulations and implement new regulations, policies, and procedures that conserve the state's wildlife and natural resources by avoiding or minimizing impacts to fish and wildlife, public lands, and natural resources.
- 3) Where impacts to fish and wildlife, public lands, and natural resources cannot be avoided or minimized then a mitigation process must be developed and implemented to replace or offset the impacts. The oil and gas industry can become impact neutral to the state's other natural resources--fish and wildlife, soil, water, and clean air--with such a process. It is incumbent that fish and wildlife and natural resource professionals develop this process. We believe that a coordinated approach by all affected state agencies, led by the Game and Fish Department, is best suited to lead this process.

Application Process:

- 4) The State Legislature (2011) passed HB 1241 which requires a seven-day notice to surface owners prior to drilling. The Chapter recommends that advance notice be provided to all surface owners, easement holders, and any third party interests 30 days prior to filing the application for a permit to drill (APD). This would allow more time for the oil company and the surface and/or easement owner to negotiate an agreed upon location for the well site in order to minimize impacts to agricultural operations, dwelling sites, or sensitive wildlife habitats.
- 5) We recommend that all APDs be accompanied by maps showing topography and/or wetlands and stream courses or waterways to assist in locating proposed wells and reserve pits away from wetlands and water courses to minimize the impacts of spills and other incidents. With the availability of National Wetland Inventory maps and other GIS spatial data, Natural Resource Conservation Service (USDA) maps, and digital elevation data, this information is not difficult to obtain and use. Many intermittent waterways and temporary and seasonal wetlands are dry in the fall or not detectable under snow cover when well sites are permitted or developed. As a result during spring snowmelt and runoff, they become flooded and create impacts, as well as costly repairs and difficulties for the oil industry (photo 8). This could be avoided with a minimal amount of planning and permit review. Such review would do much to prevent reserve pit spills during spring runoff events and avoid costly clean-up and remediation actions.

In addition, the Department of Mineral Resources should develop a set of criteria for oil and gas well locations that provide required set-back distances from wetlands, streams, and water courses, slope criteria, and analyses of soil type, and depth to water table. Natural resource data such as species of concern, threatened and endangered species, and special habitat types (sage grouse and sharp-tailed grouse leks, bighorn lambing grounds, or golden eagle nests) should also be noted and considered in the permit process. These criteria and others needed should be developed in coordination with other state agencies and the public.

- 6) Each ADP must include an emergency and spill response plan. The plan should identify the company personnel in charge of emergency or spill containment procedures, phone numbers or contact information, spill containment procedures, and identify the clean-up materials the company has on hand or available for immediate deployment. The standard for safety should be to have adequate resources in the area (within one hour's deployment time), or contracts with those entities who have resources in the area (within one hour) to be able to respond in an effective timeframe for prevention, mitigation, and clean-up. In addition, the plan shall identify the surface owner, any public land, state or federal agencies who own, administer, or manage land within one mile of or within ten miles downstream of the proposed well site, reserve pit, or oil and gas facility. The plan shall identify the public land agency by name, and list a point of contact and contact information. This information would provide for more immediate response actions in the event of a spill, leak, fire, or other incident.
- 7) The Oil and Gas Division should develop and follow a system of site specific location criteria to be considered when deciding to permit a well, reserve pit, or oil and gas facility. These criteria shall include distance to a residence, presence of wetlands or stream courses or waterways, historic or cultural resources, unique wildlife habitats or features.
- 8) The application process should be opened up in order to allow meaningful testimony from affected surface owners, local forms of government, state and federal agencies, and the public. There must be a voice for public and natural resource interests.
- 9) A state policy should be developed that designates certain public lands using either a list of to-be-developed criteria, or by specific tract/location as nonsurface occupancy areas, i.e., the "primitive" area of the Killdeer Wildlife Management Area, State School Lands. Where public minerals underlie significant blocks of public land currently unauthorized for lease, the minerals should be permanently withdrawn to protect public wildlife and wild land values.

10) We recommend that all APDs that involve hydraulic fracturing (fracking) be required to list the chemicals and ingredients proposed for use in their application. While the oil and gas companies maintain Material Safety Data Sheets (MSDS) at the well site command center, these may not be readily available in an incident such as a fire or explosion. The information should be maintained as a matter of public record on file after the actual period of well drilling. In the event of a leak or later discovered ground water contamination, the list of fracking chemicals could be used to identify the problem well. The list of fracking chemicals may not have to list the quantities or exact recipe for the fracking mixture, but the exact chemicals should be included and maintained by the Department of Mineral Resources.

Reserve pits:

11) We recommend that the Department of Mineral Resources follow through with recent comments that North Dakota should adopt rules prohibiting the use of reserve pits for all future oil and gas developments (Lynn Helms, Bismarck Tribune, May 27, 2011). The state of New Mexico recently approved such legislation (Bismarck Tribune, June 21, 2011). In addition, any new reserve pits, and to the extent possible, all existing pits that are not removed, should be documented with site specific chemical composition and GPS coordinates.

12) We recommend that surface damage payments for siting a well, reserve pit, or other oil and gas facility be based on an appraisal of the devaluation of the entire property and/or the affected property owner's surface rights. Surface damage payments based only on the acreage of the well pad, pit, and accompanying road far under compensate the surface owner for losses. In addition, the oil company should maintain the responsibility and liability for the reserve pit in perpetuity or until the reserve pit is removed from the property.

Transmission and Transportation:

13) We recommend that all pipelines including crude oil, natural gas, and waste disposal and saltwater, should be permitted and regulated by the state of North Dakota, starting at the source and specifically including all gathering lines. The same attention recommended or required for siting above-ground oil and gas infrastructure must be applied to all pipeline corridors and rights-of-way. Pipelines should be sited to exclude blocks of public land managed for wildlife, outdoor recreation, and roadless qualities. Industry coordination should be state sanctioned and regulated to avoid unnecessary cumulative impacts to wildlife, natural resources, and existing agricultural and tourism features, and avoid the unnecessary duplication of facilities.

A concentrated effort should be made to map all existing and abandoned pipelines, making corrections as previously unidentified lines are discovered and future pipelines are developed.

We recommend that the state hold jurisdiction for permitting and siting of rail transport facilities for oil and gas transportation, again to coordinate and pace development and avoid redundancy.

Similarly, electric transmission lines should be sited to exclude or avoid blocks of public land managed for wildlife, outdoor recreation, or for roadless qualities. All transmission lines and associated structures should be equipped with up-to-date and effective avian and raptor avoidance technology. Again, all transmission lines should be coordinated to avoid or minimize infrastructure disturbance.

Inspections:

- 14) In spite of recent legislative efforts to provide more Department of Mineral Resources inspectors, the number will still fall short of the number needed to systematically inspect oil and gas wells, drilling sites, and salt water injection wells at currently recommended or required intervals. North Dakota currently has about 176 drilling rigs, and that number is expected to climb to about 225, a 28 percent increase (Bismarck Tribune, May 26, 2011). The inspectors must also continue to monitor and inspect old producing wells and saltwater injection wells at rates and schedules that keep pace with well field development and with current technology. Additional inspectors will help ensure compliance with regulations and prompt response in the event of spills or incidents.

Coordination:

- 15) We recommend placing a natural resources coordinator on the governor's staff. There are so many aspects to oil and gas development that affect wildlife and natural resources that a natural resource coordinator is needed to facilitate communication and discussion among state agencies, involved federal and local agencies, landowners, and the public on oil and gas, other energy, and natural resource issues. Former North Dakota Governors Link, Olson, and Sinner used such positions on their staff to coordinate the state's interests and identify and facilitate the advocacy for natural resource issues.
- 16) We recommend a State Coordination Act or consultation process involving the Department of Mineral Resources, State Engineer's Office, State Health Department, Game and Fish Department, Department of Commerce, Department of Tourism, Parks and Recreation Department, Department of Transportation, and Agriculture Department to plan and accommodate energy development, protect surface owners' rights and property, and conserve natural resources.

- 17) We recommend and support studies by the wildlife and natural resource agencies and nongovernmental organizations to collect baseline data and objectively evaluate the impacts of oil and gas development and production on wildlife and environmental quality. This includes support for the current Environmental Protection Agency study to evaluate the impacts of hydraulic fracturing processes in North Dakota.

We request that wildlife and natural resource agency comments on APDs and all oil and gas developments such as, but not limited to, pipelines, substations, gas plants, and water depots be given due and greater consideration. While we recognize that mineral rights are superior to other property rights, we believe that the mineral and energy resources can and must be developed in a conscientious manner that also protects or minimizes impacts to existing natural resources and community and public values.

- 18) We recommend establishing a landowner or surface owner hotline or call-in service within the Department of Mineral Resources to get advice or recommendations on how to deal with oil and gas development on their property. The hotline could also serve as an emergency call center for the public to call in a spill or emergency at an oil and gas or energy facility.

Baseline conditions:

- 19) We recommend that state and federal agencies develop data on current conditions and habitat quality and values, wildlife populations, and public use on public and private lands in order to assess oil and gas and other energy impacts in the future. Such data are necessary in order to make accurate recommendations to avoid and mitigate energy impacts. Such data collection and baseline condition studies will require funding and personnel to accomplish, and we support that funding and personnel requests for both affected state and federal agencies.
- 20) We recommend that state agencies, especially the Game and Fish Department, be directed to hire additional staff to work on oil and gas issues. At a minimum we recommend a biologist/land manager position and a clerical position for the Williston office, and a biologist/manager for the Dickinson office of the Game and Fish Department.
- 21) In addition to the sharp-tailed grouse study being conducted by the Game and Fish Department in northwestern North Dakota, we recommend similar studies on big game species, especially mule deer, pronghorn antelope, and white-tailed deer in northwestern North Dakota and the Badlands region, sage grouse in the southwestern portion of the state, and Sprague's pipit in the northwest. The results should be reported to the public and should include best management practices or criteria to conserve these species.

- 22) We recommend that the U. S. Fish and Wildlife Service conduct baseline and impact studies on waterfowl and prairie nongame birds in the northwestern portion of the state. The existing four-square mile study could be used to provide baseline data for waterfowl population studies and analysis of oil and gas impacts. Similarly, the results and best management practices or criteria should be reported to the public.

We also recommend that the State Health Department conduct studies on water chemistry and quality, with emphasis on chemicals involved in oil and gas production, aquatic invertebrates, and plant species on a sample of wetlands, potholes, lakes, and streams to provide baseline data.

Public Information:

- 23) Post all spill reports, locations, and data on a public website in order that the public, surface owners, local forms of government, other agencies, and the legislature may have access to up-to-date information and data.

Miscellaneous:

- 24) We recommend developing criteria or guidelines for lighting on oil derricks and drilling platforms near or close to the vicinity of certain natural resource areas such as the perimeter of Theodore Roosevelt National Park, the U. S. Forest Service Elkhorn Ranch site, and possibly some public (or private) campgrounds. Agencies have guidelines and recommendations for both the types of lighting and directional attributes that would reduce the night time visual impacts of oil development near these areas.

CONCLUSION:

As a result of the tour through the oil patch in northwestern North Dakota, Chapter members were able to observe, learn about, discuss, and document many of the impacts that are occurring to fish and wildlife and natural resources as a result of oil and gas development. This report makes such findings available to the agencies that deal with all aspects of oil and gas development in the state. We believe the recommendations can be implemented with a minimum of restriction or lessening oil and gas development and production. With comprehensive planning and review of oil and gas development, many of the environmental and agricultural impacts can be avoided or minimized. For those that cannot, mitigation measures can be developed and must be implemented to assure that the state's wildlife and natural resources are maintained for the benefit of our citizens. The Chapter offers to assist or provide data or recommendations to the involved state agencies.

Introduction of the North Dakota Chapter of The Wildlife Society:

The North Dakota Chapter of The Wildlife Society is a science-based organization comprised of about 350 members in the wildlife and natural resource professions--biologists, land managers, researchers, educators, administrators, law enforcement officers, and students. Chapter members are employed by over 25 state and federal agencies, universities, and nongovernment organizations in North Dakota. The Chapter was organized in 1963 and is affiliated with The Wildlife Society, headquartered in Bethesda, Maryland.

The Chapter has been actively involved in wildlife and natural resource conservation issues since its inception. The Chapter was instrumental in brokering the compromise on the Garrison Diversion Unit controversy in 1986 leading to the Garrison Reformulation Act of 1986 and the subsequent Dakota Water Resource Act of 1999. After suing the State Engineer's office over the Russell Diversion Drainage Project in Bottineau County, the Chapter, the governor's office, and the State Engineer's office worked to resolve a number of wetland drainage projects--Wells No. 1 (1987) and Crystal Springs Drain. The Chapter worked with the Congressional delegation on the Meridian minerals exchange (1998) in the Little Missouri National Grasslands and on the Missouri River Authorized Purposes Study (2009).

The Chapter has had a lobbyist during state legislative sessions since 1991 and supported the nongame tax check-off passed in 1987. The Chapter worked with state officials and farm groups to pass the "No Net Loss of Wetlands" legislation in 1987.

In September 2002, the Chapter hosted the National TWS Conference in Bismarck attended by 1,450 wildlife professionals. The Chapter has hosted a number of other regional symposia on natural resource issues. The Chapter has worked on State School Land issues, wilderness and roadless area proposals for the Badlands, the Farm Bill since 1985, and the elk reduction program at Theodore Roosevelt National Park (2010).

The Chapter is currently planning for its Fiftieth Anniversary celebration in Mandan, North Dakota, in February 2013.

Photographs:



Photo 1. Lewis and Clark Wildlife Management Area. Flooded oil wells in Lake Sakakawea, south of Williston (background of photo) on June 4, 2011.



Photo 2. Waste water from inside oil well being pumped into Lake Sakakawea and the Missouri River on the Lewis and Clark Wildlife Management Area, June 4, 2011.



Photo 3. Hofflund Wildlife Management Area along Lake Sakakawea/Missouri River. Mega-pad well site being diked to prevent rising reservoir levels from flooding the well pad on June 4, 2011. Reserve pit is buried in the left foreground.



Photo 4. Plastic reserve pit liner from mega-pad (photo 3) on the Hofflund Wildlife Management Area, June 4, 2011.



Photo 5. Well site on private land in Section 17, T. 158 N., R. 89 W., Mountrail County. Tract has FWS wetland easement, USDA Wetland Reserve Program easement, and Game and Fish Department PLOTS agreement. Reserve pit is buried on left side of oil pad. June 5, 2011.



Photo 6. Fish kill at Short Creek Dam and Wildlife Management Area in summer of 2010.



Photo 7. The Ray spill in spring of 2011. Topography and land slope to right side of photo to highway ditch and culvert directly into Ray Lake, Williams County, ND.



Photo 8. Oil truck stuck in a wetland in northwestern North Dakota. Location of well pads in environmentally sensitive sites has costs for the industry as well as for wildlife.