



Loggerhead Shrike in Oil Pit. Photo by Brent Esmoil/USFWS

**Birds may have trouble distinguishing pristine wetlands from small pits, ponds and reservoirs containing oil. Waterfowl and other aquatic birds may be attracted to pits and open tanks used to store and separate oil from produced water. The pits also can attract hawks, owls, songbirds, bats, insects, small mammals, and big game. Songbirds and mammals may approach oil-covered pits and ponds to drink, and can fall into the pits, or they can become entrapped if the banks of the pits are oiled. Insects entrapped in the oil can also attract songbirds, bats, and small mammals. Hawks and owls in turn become victims when they are attracted by struggling birds or small mammals. In Wyoming, U.S. Fish and Wildlife Service (USFWS) personnel have found waterfowl, songbirds, bats, pronghorn, and deer in oil pits and tanks.**



Oil-covered teal in oil pit. Photo by Pedro Ramirez, Jr./USFWS

## U.S. Fish and Wildlife Service

# Wildlife Mortality Risk in Oil Field Waste Pits

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### The Problem

The risk that oil pits pose to wildlife has been documented by several studies (Esmoil 1995, Flickinger 1981, Flickinger and Bunck 1987, Grover 1983, and King 1956). Wildlife attracted to oil-covered pits or ponds suffer death in several ways:

- they can become entrapped in the oil and drown;
- birds can ingest toxic quantities of oil by preening their oil-covered feathers;
- mammals can ingest toxic quantities of oil when they try to lick their fur clean; and
- cold stress can kill the animal if oil damages the insulation provided by feathers or fur.

Even if animals are not killed in the pits, the oil and chemicals in the pits can harm them later. If they absorb or ingest oil in less than toxic amounts they may suffer a variety of systemic effects and may become more susceptible to disease and predation. During the breeding season, birds can transfer oil from their feet and feathers to their eggs. In some cases, a few drops of oil on an egg shell can kill the embryo (King and LeFever 1979). USFWS Environmental Contaminants (EC) Specialists and Special Agents have observed evidence of scavengers feeding on oiled wildlife carcasses near oil pits. Scavengers and predators can also suffer indirect effects by consuming oil-covered carcasses.

Mortality events in oil pits can be episodic; there may be long periods without incident, but then large numbers of birds may be killed during short periods, such as migration. Grover (1983) found that in southeastern New Mexico, wildlife losses in oil pits during the summer consisted of inexperienced, recently fledged or weaned wildlife.



Skim pits are used to separate oil from produced water and are death traps for wildlife. Flagging is an ineffective deterrent for preventing wildlife mortality in oil pits. Photo by Pedro Ramirez, Jr./USFWS

During the fall, waterfowl and shorebirds were the primary victims of oil pits. Esmoil (1995, personal communications) found a disproportionate number of loggerhead shrikes killed during a two-week period that coincided with fledging. He found 35 birds in one oil pit in Hot Springs County in May 1989.

Esmoil (1991, 1995) recovered 334 birds from 53 pits in Wyoming between mid-May and mid-August in 1990. He also found cottontail rabbits, bats, mice and prairie dogs entrapped in oil pits. Although waterfowl are usually the most visible victims, small songbirds appear to suffer higher mortality in oil pits. In 1989 and 1990, Esmoil (1995) surveyed 88 pits in five oil fields in the Bighorn Basin of Wyoming and found a total of 616 bird carcasses. Songbirds accounted for 41 percent of the carcasses and aquatic birds made up 19 percent. Lee (1994) found dead songbirds in 37 percent of the mortality cases he investigated in the Texas Panhandle from 1987 through 1992.

In Wyoming, EC Specialists and Special Agents have observed large kills of migratory waterfowl during the fall migration. Some large mortality events documented by EC Specialists and Special Agents in Wyoming include:

- 81 birds in one site at Fremont County in August 1998;
- 17 birds in an 8 ft. by 10 ft. pit in Crook County in May 1998;
- 46 birds in a 30 ft. by 30 ft. pit in Johnson County in July 1996;
- 62 birds in a 100 ft. by 100 ft. pit in Washakie County in September 1995; and
- 22 birds in a commercial oil field waste disposal facility in September 1994.

The absence of wildlife or carcasses in pits does not mean that the sites are not risks for migratory birds and other animals. Wildlife mortality in oil pits can go undetected because carcasses in oil pits can sink and remain undetected (Flickinger and Bunck 1987); because scavengers such as coyotes, raccoons, and raptors can remove the carcasses from the edges of pits; and because people can remove carcasses from them.



Oil-covered duck carcass partially eaten by scavengers. Photo by P. Ramirez, Jr./USFWS



Proper netting of oil pits can exclude wildlife and prevent mortality. Photo by Pedro Ramirez, Jr./USFWS

## Solving the Problem

Solutions to the oil pit problem are fairly simple and straight forward and are being implemented by many oil operators. We suggest the following measures:

- **Use Closed Containment Systems** - Closed containment systems require little or no maintenance and the system can be moved to a new site when the well is shut in. Closed containment systems eliminate soil contamination and remediation expense.
- **Eliminate Pits or Keep Oil Off Open Pits or Ponds** - A fail-safe solution is to remove the pits or keep oil from entering the pits. Immediate clean up of oil spills into open pits is critical to prevent wildlife mortalities.
- **Use Effective & Proven Wildlife Deterrents or Exclusionary Devices** - netting appears to be the most effective method of keeping birds from entering waste pits.



Photo by P. Ramirez, Jr./USFWS

Properly installed net (left) is supported by a steel frame and cable to prevent sagging. Sides are also netted to prevent ground entry by birds and other wildlife. Nets sagging into the oil-covered pond (bottom) after a heavy snow-load will expose the oil and entrap waterfowl. Nets should be installed 4 to 5 feet above the pond surface to allow for sagging.



Photo by Gary Mowad/USFWS

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For more information contact: U.S. Fish & Wildlife Service, 4000 Airport Blvd., Cheyenne, WY 82001; 307-772-2374. Also visit the USFWS web site at <http://www.fws.gov> and the USFWS web site on oil pits at <http://www.r6.fws.gov/contaminants/oilpits.htm>

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