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CAFOs Feed a Growing Problem



USFWS photo

While eating their favorite hamburgers, chicken, or pork chops, people seldom stop to think about where these foods originate. If they do, a small family farm may come to mind. But that traditional picture is changing with the trend towards large, corporate agricultural operations.

The number of livestock animals concentrated in large concentrated animal feeding operations, or CAFOs, has increased dramatically in the last decade. During a 10-year period in California, the number of swine CAFOs decreased by 50 percent but the number of animals per operation rose 200 percent. Such CAFOs often house thousands of animals: in Texas, for example, nearly half of the permitted beef cattle CAFOs hold more than 16,000 animals. Because CAFOs are often clustered, local watersheds can be overloaded with nutrients, and possibly other contaminants, from discharges and run-off. Waste from animal feeding operations is degrading water quality and air quality in many areas of the country, from California to the Carolinas. The impacts from CAFOs may be both long-term and catastrophic.

Chronic, excessive discharge of nutrients over a long period of time leads to algal blooms, which lower dissolved oxygen levels in streams and lakes. These oxygen depleted waters are more suitable for species that are tolerant of poor water quality, less suitable for most sport fish or sensitive species, and usually result in lower species diversity.

Elevated levels of organic nutrients may favor proliferation of the microbe *Pfisteria*, which can kill fish and may even threaten human health. Excessive

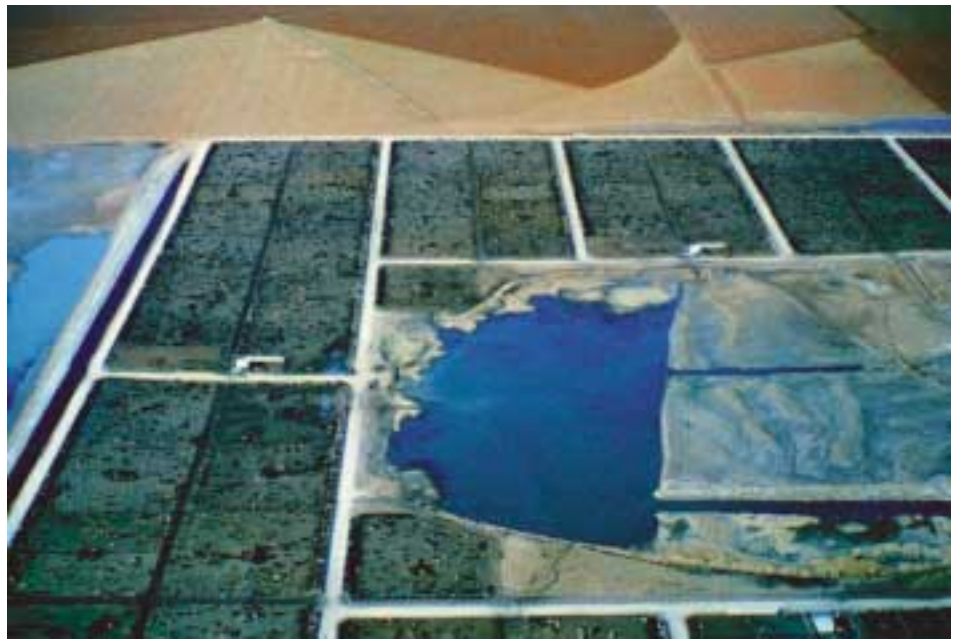
input of nutrients and anaerobic bottom sediments may also provide vectors for animal diseases such as *Salmonella*, *Staphylococcus*, *Streptococcus*, avian botulism (*Clostridium botulinum*), and avian cholera (*Pasteurella multocida*), microorganisms that can kill large numbers of waterfowl. Bacteria and other disease-causing organisms from CAFOs could also pose a health risk for people and wildlife, including direct or indirect adverse impacts on migratory bird populations. Ground water can also be polluted by excess nitrates and other contaminants that leach through the soil over time.

Accumulations of heavy metals and other contaminants may cause chronic problems affecting the health and reproduction of many aquatic and avian species, and contribute to water quality impairment and harm to aquatic organisms in local waterways. Some of the heavy metals in feed additives, such as zinc, copper, arsenic, nickel, manganese, and selenium, will end up in animal wastes and be concentrated in holding ponds and/or spread on fields as fertilizers. Concentrations of selenium (a trace mineral necessary in low levels but toxic in high levels) in surface waters of some CAFO waste storage pits or lagoons exceed safe levels for aquatic life by tenfold. Runoff or uncontrolled releases from CAFOs can transport selenium to natural water bodies, where it can increase in concentration as it makes its way up the food chain and may reach toxic levels in fish and other aquatic organisms. Excess heavy metals can be toxic to plants and lead to reproductive impairment, poor body condition, and immune system dysfunction in animals.

The catastrophic effects of sporadic large-scale CAFO discharges are more visible. Lagoon spills or overflows can discharge large volumes of animal waste into streams or lakes. When spills occur, high ammonia levels in animal waste lagoons can kill aquatic organisms and the large amounts of organic matter quickly deplete the oxygen in the water. Fish kills related to CAFOs occur each year, and the risks of large fish kills increases with the size and density of CAFOs in watersheds. For example, statistics from Nebraska indicate that one-half of the fish kills related to agricultural sources between 1989 and 1992 were caused by livestock waste. When a large swine lagoon in North Carolina breached, it killed fish and other aquatic organisms for 18 miles (30 kilometers) downstream.

The U.S. Fish and Wildlife Service (FWS) is becoming increasingly concerned about the potential effects of a growing CAFO industry on our nation's natural resources. A lack of coordination with the FWS in developing and implementing methods for CAFO management could lead to violations of Federal laws. For this reason, reviews of Environmental Protection Agency permits for CAFO construction, issued in compliance with the National Pollution Discharge Elimination System, are a growing part of our workload. Site selection for CAFOs should be based on a variety of factors relating to the vulnerability of natural resources, and buffer zones shielding sensitive surface waters should be designed into facilities at an early stage in the planning process. When properly used, animal waste is a good fertilizer and soil additive, but it must be carefully applied in a way that will minimize adverse effects to natural resources. Cooperation in developing long-term sustainable agricultural practices for CAFOs will preserve the productivity of our soils, protect the quality of our waters, and conserve our biodiversity.

Some potential impacts of CAFOs on the environment, such as the effects of



A large lagoon of liquid animal waste at a CAFO site.

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excess nutrients, contaminants, and disease transmission, need additional research if we are to determine the full risks associated with long-term operation of animal feeding operations. These effects can have far reaching and long-term implications on the environment that both people and wildlife share. Contamination of soils and ground water are not easily or quickly corrected once they occur, and their effects on resources such as wetlands, fisheries, and federally-listed species may last for decades.

It is important that we gather the necessary information to protect the nation's fish and wildlife resources before watersheds are impaired to the point that additional species need to be listed or their recovery becomes too difficult and expensive. The research to determine potential effects of CAFOs on biological resources, prevent adverse effects, and restore contaminated watersheds is a priority of the FWS Environmental Contaminants Program.

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Some CAFOs are in locations that may result in take of species and habitats protected by the Endangered Species Act. In California, an 11 million gallon (42 million liter) spill of liquid waste from a large poultry farm damaged a wetland vernal pool system in the Arena Plains Unit of Merced National Wildlife Refuge, killing endangered vernal pool fairy shrimp (*Branchinecta lynchi*) and vernal pool tadpole shrimp (*Lepidurus pochardii*). This resulted in a large fine, some of which went for acquisition of prime habitat for the refuge as compensation for damages to natural resources.