Pesticide Threats to Endangered Species: Case Studies

January 2004

Pesticides threaten the survival of endangered species across the U.S., with species at risk ranging from sea turtles in Chesapeake Bay to salmon in the Pacific Northwest.

Pesticides Threaten Sea Turtles and Other Species in Chesapeake Bay

Endangered sea turtles and other species in the Chesapeake Bay are exposed to harmful concentrations of the herbicide atrazine, a known endocrine disruptor that threatens endangered species both directly and indirectly.

Polluted Watershed: Atrazine, which has been banned in several European countries, is one of the most widely used herbicides in the United States. Between 60 million and 70 million pounds of atrazine are applied every year to fields, golf courses, and lawns.[1] The U.S. Geological Survey has detected atrazine throughout the Chesapeake Bay and in every major river and stream that feeds into the Bay.[2]

Direct Threat to Sea Turtle Reproduction: Atrazine may disrupt the hormonal system in sea turtles, which can impact their reproductive success. A number of studies have shown that atrazine causes sexual defects in frogs, including feminization and deformities in sex organs.[3]

Destruction of Habitat and Food Supply: Atrazine runoff in the Chesapeake Bay destroys the habitat and food sources for sea turtles.[4]

The U.S. Environmental Protection Agency has concluded that atrazine may be jeopardizing the survival of endangered sea turtles and other species, but the Agency has not taken any steps to restrict atrazine's use.[5] The Natural Resources Defense Council recently filed a lawsuit in federal court in Baltimore in an effort to restrict atrazine use, in order to protect endangered species in the Chesapeake Bay and elsewhere.[6] That lawsuit is still under way.

Salmon. Photo by: Brett Cole

Pesticides Threaten Salmon and Steelhead in the Pacific Northwest

Pacific salmon face a number of hurdles to their survival, with their complex life cycle that takes them from freshwater streams to the ocean, then back to their home streams to spawn. Recently, it has become clear that pesticide pollution in salmon streams and rivers is degrading water quality and may be threatening salmon survival.

Polluted Salmon Streams: The U.S. Geological Survey detected dozens of pesticides in each of the six watersheds studied in the region. A number of these pesticides have been found in the region's watersheds at or above criteria set to protect aquatic life, indicating they are likely to harm salmon.[7]

Pesticides Harm Salmon Directly: Pesticides can kill salmon or interfere with important behaviors such as swimming and avoiding predators. Examples abound: azinphos methyl has caused massive fish kills throughout the U.S[8]; studies find that trout lose orientation in currents when exposed to 2,4-D[9]; and trifluralin has been shown to cause bone abnormalities.[10] All of these pesticides have been found in northwest waters at harmful levels.[11]

Threat to Reproduction: Pesticides can disrupt the hormonal system of salmon, which is key to reproduction. Diazinon has been found in northwest waters at levels that reduce production of testosterone by male salmon. This hormonal change may weaken the chances that salmon will mate successfully.[12]

Disruption of Habitat: Minute amounts of many pesticides kill aquatic invertebrates and plants, reducing a critical food source for salmon. Atrazine, virtually ubiquitous in the northwest salmon streams monitored, may cause increased predation of small fish when water plants are killed by the herbicide.[13]

The U.S. Environmental Protection Agency is currently engaged in a court-ordered consultation with the National Marine Fisheries Service on the adverse effects of pesticides on salmon. The goal of the consultation, which proceeds under Section 7 of the Endangered Species Act, is to identify needed changes in pesticide regulation to reduce pollution of salmon streams and harm to salmon. Since the full consultation will likely take years, federal Judge Coughenour has ordered interim protections to prevent pesticide applications near salmon streams.

Pesticides Linked to Amphibian Declines in California

Pesticides may be a factor responsible for declines in amphibian populations in California, including declines of the threatened red-legged frog, the mountain yellow-legged frog, and the Yosemite toad. In areas without other types of habitat destruction, studies have linked declining populations to pesticide exposure.

Red-legged frog. Photo by: Ryan Hagerty, courtesy USFWS

Each year, roughly 156 million pounds of pesticides are applied to crops in the Central Valley (figures for 2000), a portion of which is carried by winds into the seemingly pristine areas of the Sierra Nevada.[14] Rainwater brings drifting pesticides back to earth, where they are absorbed through the frogs' moist skin. Gary Fellers of the U.S. Geological Survey (USGS) characterizes frogs as "essentially environmental sponges, soaking up chemicals from water."[15]

Frogs in Decline: Populations of the red-legged frog, foothill yellow-legged frog, mountain yellow-legged frog and Yosemite toad have declined sharply over the past two decades. Amphibians have disappeared from high elevation, seemingly pristine habitats in the Sierra. Several California frogs have declined disproportionately from sites that are downwind from areas with agricultural activity.[16]

Pesticides Harm Amphibians: Exposure to extremely low concentrations of atrazine, although not lethal, resulted in the dramatic feminization of male frogs.[17] Exposure to certain chemicals can make larval amphibians more vulnerable to parasites and predators.[18]

Pesticides in Amphibian Habitats: A recent U.S. Geological Survey study found organophosphate pesticides, including chlorpyrifos, malathion, and diazinon, in Sierra amphibian habitats.[19]

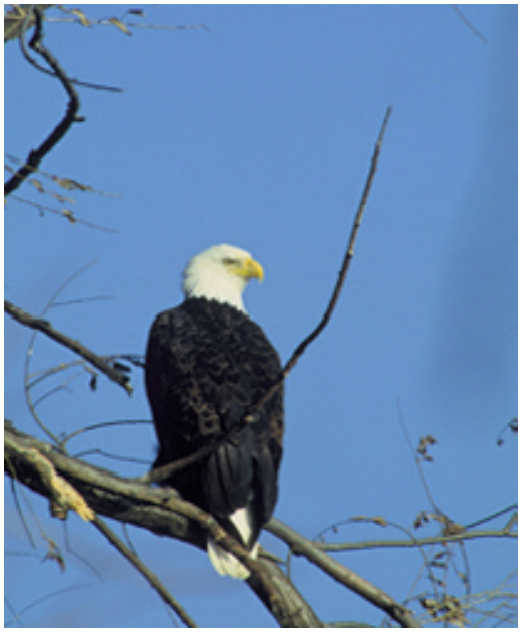
Pesticides Contaminate Frog Tissues: Even frogs collected from high in the Sierra Nevada contain detectable concentrations of organochlorine pesticides that appear to be compromising their immune systems.[20]

Of the four Sierra amphibian species currently in decline, the red-legged frog is already listed as threatened under the federal Endangered Species Act; the Southern California population of the mountain yellow-legged frog is listed as endangered and a petition to list the Sierra Nevada population has been submitted; a petition to list the Yosemite toad has been submitted; and, a petition to list the foothill yellow-legged frog is being prepared.

Carbofuran Harms More Than 100 Bird Species in U.S.

Carbofuran, a pesticide commonly used in agriculture, is highly toxic to birds, mammals and aquatic species. According to the EPA's incident database, carbofuran is the pesticide associated with the greatest number of bird kills in the U.S. Wildlife deaths have been documented in at least 20 states. Carbofuran is produced in both a granular and a liquid form and is used on many agricultural crops.

Birds can be exposed by eating insecticide granules, by eating contaminated insects, plants, or animals, by inhaling it, by absorbing it through their skin or by drinking or bathing in contaminated water.



Bald Ealge. Photo by: Steve Maslowski, courtesy USFWS

EPA Finds High Risk: A 1992 EPA Special Review of carbofuran concluded that carbofuran is highly toxic to birds and kills many birds even when used according to label instructions.

Carbofuran Kills Birds: Carbofuran has caused mortality in more than 100 different species of birds including waterfowl, upland gamebirds, shorebirds, woodpeckers, raptors (such as Bald and Golden Eagles, Great Horned Owls, Red-Tailed Hawks, and Kestrels) and numerous species of songbirds.

Wildlife Agency Calls for Ban: Since the early 1990's the U.S. Fish and Wildlife Service has been urging EPA to cancel of all forms of carbofuran because of its extreme toxicity to wildlife.

In the 1990's EPA phased out most uses of the granular form of carbofuran. FMC Corp., the sole manufacturer of carbofuran, and several agricultural organizations want to lift the restrictions on its use. The liquid form is still widely used and scientists believe that the liquid form is even more toxic to wildlife. States routinely use EPA's Emergency Exemption process as a loophole for obtaining carbofuran for uses that are currently banned.

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