



*Ecological Contaminants
biologists help turn
environmental hazards
into healthy wetlands.*

By Brian Spears



Bridging the Gap

When hazardous substances enter the environment, fish and wildlife can be injured. Perhaps no example is more evident on a local and national scale than in the Coeur d'Alene Basin in northern Idaho, one of the nation's largest Superfund sites. Plants, fish and wildlife using the area are threatened by exposure to heavy metal wastes generated by more than a century of mining. The specialized biologists of the Service's Ecological Contaminants (EC) program, however, are bridging the gap between Superfund contamination, cleanup and the Service's mission of restoring the health of our trust resources.

As late as the 1880s, the 1,500-square mile Coeur d'Alene Basin was rich with fish and wildlife. The Basin had abundant evergreen forests, cottonwoods and silver beeches and was home to deer, beaver, muskrat, otter, wolves, mountain lion, badgers, wolverines, moose, bear, numerous bird species and schools of trout. During the next 120 years, that would change.

Discovery of gold in the Coeur d'Alene River's North Fork in 1883 attracted thousands of prospectors and their families. While the gold rush was short-lived, the upper basin became the largest historic silver, lead and zinc mining district in the world, ultimately producing 7 million metric tons of lead, 30,000 metric tons of silver and 3 million metric tons of zinc. Impacts soon followed: mining wastes, including arsenic, cadmium, lead and zinc, were discharged directly into the river and its tributaries or were deposited on land, migrating into ground and surface water. The Coeur d'Alene River carried these contaminants west

into Lake Coeur d'Alene and into adjacent wetlands, and occasional river flooding deposited contaminated sediment throughout the 19,200 acre lower Basin floodplain. More than 100 million tons of soil and sediment were affected by mining. Waste rock, tailings, mine drainage, and contaminated flood plain sediments continue to pollute the ecosystem with extremely elevated metals contamination.

In 1983, the Environmental Protection Agency (EPA) placed the Bunker Hill Mining and Metallurgical Complex Superfund facility on the National Priorities List, in response to human health risks associated with mining-related metals contamination. In 1991, the U.S. Departments of Interior (Service and Bureau of Land Management) and Agriculture and the Coeur d'Alene Indian Tribe (collectively known as the Coeur d'Alene Basin Trustees) initiated a Natural Resource Damages Assessment (NRDA) to assess damages under CERCLA and the Clean Water Act.

This group documented that, among other things, approximately 18,300 acres (95 percent) of the lower floodplain contained lead levels above those observed to harm waterfowl, and approximately 15,400 acres (80 percent) contained lead levels above those observed to kill them. A comprehensive cleanup has been estimated at more than \$1 billion.

Despite its heavy-metals contamination, the Basin continues to be a major stopover for waterfowl migrating along the Pacific Flyway. Local waterfowl are exposed to lead and lead toxicity via ingestion of contaminated sediment while feeding. EC biologists have documented this as the cause of death in more than 10 waterfowl species, and the primary cause of death in tundra swans using the 5,362 wetland acres in the Lower Coeur d'Alene Basin as feeding habitat. Tundra swan deaths in the Basin have been documented since 1924, and continue today. Spring migration deaths, due to lead poisoning unrelated to lead artifacts (i.e., hunter lead shot), averaged 150 per year between 1981–2004. A population model developed to convert Basin tundra swan mortality to lost swan-years (based on a life span of 25 years, and lost first-year progeny) estimates that 40,000 swan-years were lost between 1981 and 2004, with future mortalities expected to continue. >>

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(Gap, continued)

To partially compensate the public for resource injuries, EC biologists proposed providing waterfowl feeding areas within the Basin that included sediment below toxic metals concentrations. This meant restoring wetland structure and function, and thus safe feeding areas for tundra swans.

Service EC biologists aren't typically involved in Superfund Record of Decision (ROD) discussions. However, close EC involvement throughout the 1990s proved to be invaluable. They determined early on that the best way to jump start ecological restoration was to get this work included in the EPA's ROD for the lower Basin. Despite the fact that Superfund RODs usually deal with human health rather than wildlife concerns they were able to insert language requiring waterfowl feeding areas in the ROD. The ROD involving the lower Basin was signed in 2002, and specifies cleanup goals within the Basin. The goals provide for 4,500 acres of safe waterfowl feeding areas, which include remediating 3,000 acres of contaminated palustrine and lacustrine habitat, and converting 1,500 acres of agricultural land to wetlands.

Success Stories

A project on private property in the center of the lower Basin quickly became a major success story. Soil sampling in 1999 by EC biologists from the Spokane field office helped identify this farm and ranch as having high quality potential for inclusion in the Superfund remediation program. EC biologists facilitated discussions between the landowners, Ducks Unlimited and EPA to restore 380 of their historic wetland acres drained for farming. These discussions culminated in EPA's purchase of a perpetual conservation easement in April 2006, and an announcement of this innovative approach by EPA, the Service,

the Coeur d'Alene Tribe, the State of Idaho and Ducks Unlimited.

Since then, EC biologists have continued to provide multiple avenues of technical assistance to EPA, including more accurately determining the location and best way to remediate low-level metals contamination; identifying the best sources of clean water for perpetual wetland flooding purposes and technical aspects of long-term wetland function; reducing future wetland operations and maintenance costs; and helping address water rights issues and legalities of Superfund work. The Service has also facilitated pass-through technical assistance agreements from EPA to Ducks Unlimited for help in evaluating the area and providing input on designs for the most efficient, productive wetlands possible.

EC biologists are also helping to identify other areas suitable for wetland remediation and/or restoration in the Basin, with a focus on areas where hydrological alterations or other modifications have destroyed or impaired former wetland habitat. Because these activities are being conducted under the Superfund program, they are funded by EPA. This work helps EPA fulfill its ecological remedial goals, while spending very little Service funding to conduct valuable ecological restoration activities.

In addition, EC biologists are also Trustee representatives for the Service on the Coeur d'Alene Basin Natural Resource Trustee Council, which is proposing to spend NRDA settlement funds on a number of related restoration projects. For example, the Trustees are focusing on finding willing participants in acquiring land preservation agreements for high quality current or historic wetlands that, once restored or remediated, would improve water quality and ecological

diversity. EC biologists continue to lead the Basin NRDA process in developing opportunities to work with local and regional planning groups while coordinating with ecological remediation activities conducted through Superfund.

The Service relies on innovative EC approaches to conduct work in areas like the Coeur d'Alene Basin, where restoring wetlands in the middle of a highly contaminated Superfund site can provide healthy habitats. The vision that perhaps one day their work will help restore the wild spectacle that once astounded visitors to these unique areas is why the Service's EC biologists dedicate their careers to this vital work and help other agencies with public health responsibilities achieve success—for wildlife and people. □

Brian Spears is a Resource Contaminants Specialist at the Upper Columbia Fish and Wildlife Office in Spokane, Washington

By The Numbers

1 Number of Federal programs solely charged with ensuring the health of wildlife and the quality of their habitat (Service EC program)

500 Approximate number of hazardous waste cleanups completed on national wildlife refuges

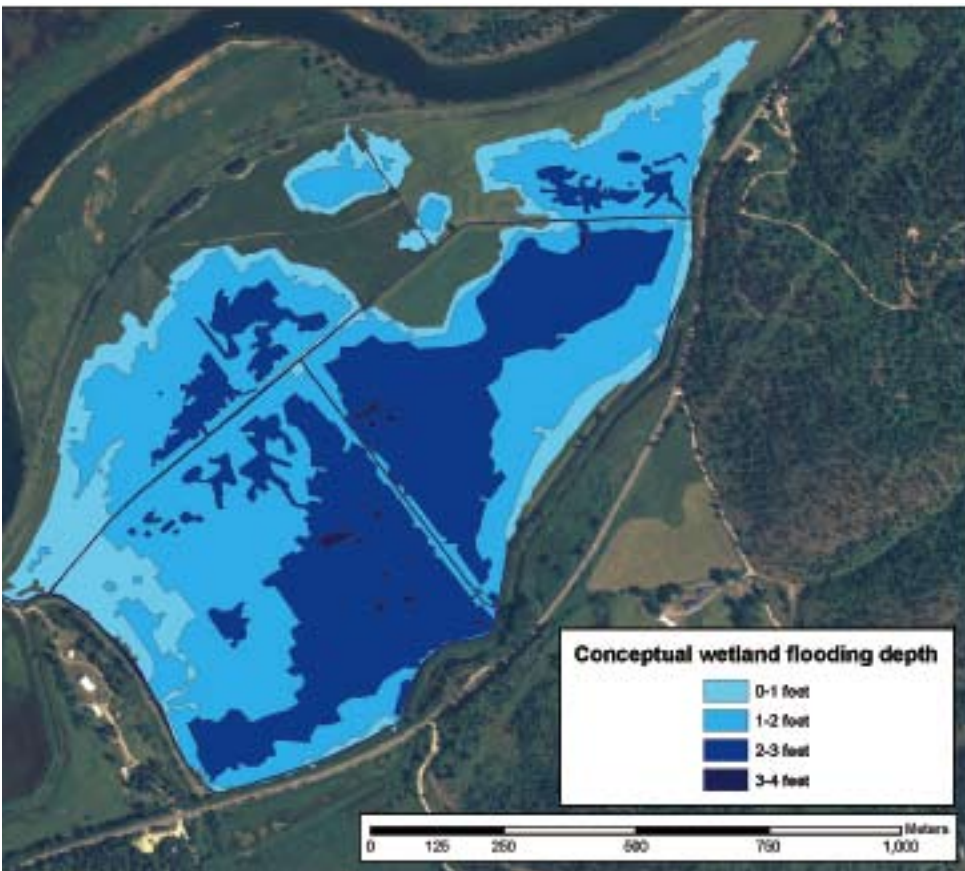
200 Approximate number of sites damaged by oil or hazardous substance spills assessed by EC biologists resulting in Natural Resource Damage Assessment restoration settlements

23,288 Number of wetland acres restored/enhanced by FWS during fiscal years 2004–06 through the EC related Natural Resource Damage Assessment process

58 Percent of FWS EC biologists currently working solely off non-FWS funded reimbursable salaries to accomplish the program's mission



Above: Dead tundra swans collected from a private property in the Coeur d'Alene Basin on April 19, 1997. The DOI estimates that approximately 150 tundra swans die from ingestion of lead contaminated sediment each Spring migration in the Coeur d'Alene Basin, Idaho.



Left: Service EC biologists continue to aid EPA in the cleanup and wetland restoration of a contaminated private property in the Coeur d'Alene Basin, including facilitating negotiations, providing toxicological technical assistance and helping develop conceptual flooding designs.