

# Toxic Floods of the Coeur d'Alene

A confluence of two rivers & a confluence of two histories: logging and mining

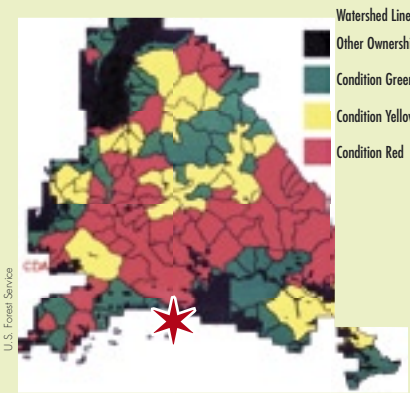
When the two federal plans for the Coeur d'Alene watershed—EPA's Superfund cleanup plan and the U.S. Forest Service's forest plan for the Coeur d'Alene National Forest—are blind to each other

## NORTH FORK, COEUR D'ALENE RIVER

### FLOODS FROM A FOREST UNRAVELLING

Massive clear cuts and logging road networks make this the most damaged National Forest in the United States

PRELIMINARY ESTIMATES OF WATERSHED CONDITION  
Based on Harvest, Roads & Run/Snow, or RRS when available



Here is a graphic and dramatic illustration of the result of the Forest Service's flawed and illegal policies. This map depicts the state of watershed health in the Idaho Panhandle National Forests (IPNF), and is part of an evaluation of watershed conditions across all of Region 1 (northern Idaho & Montana).

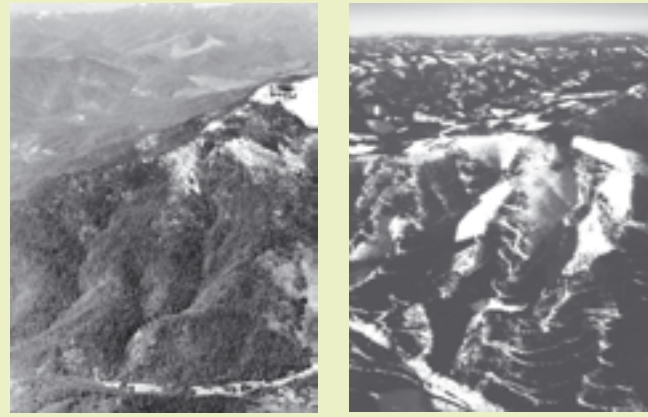
The red indicates watersheds that the Forest Service calls 'management constrained.' If you want to be more blunt and truthful, these watersheds are trashed. The yellow indicates drainages which preliminary indications suggest have some of the parameters of instability and these watersheds require further study. The green displays watersheds that still have integrity. Most of these watersheds are in roadless condition, and/or have been only lightly logged.

Perhaps the most dramatic illustration of watershed abuse in the entire National Forest System has taken place in the North Fork of the Coeur d'Alene River drainage, which encompasses the Fernan and Wallace Ranger Districts on the IPNF. Excessive road building has created areas that have road densities of up to 20 miles per square mile of forest.

Massive clearcut logging and mining have yielded stream instability and toxic heavy metal pollution. Floodwaters from the North Fork are discharged onto a floodplain, contaminated with heavy metals, pushing toxic metals and nutrients into Lake Coeur d'Alene. In spite of this, Forest Service officers continue to propose large timber sales. These sales call for the same clearcut-like logging that has destabilized the Coeur d'Alene watershed and caused the extirpation of the bull trout and the loss of viability of the native westslope cutthroat trout, Idaho's state fish.

Barry Rosenberg, The Lords Council, excerpt from testimony before the U.S. House Natural Resources Subcommittees on National Parks, Forests, and Public Lands, and Oversight and Investigations, February 1, 1994.

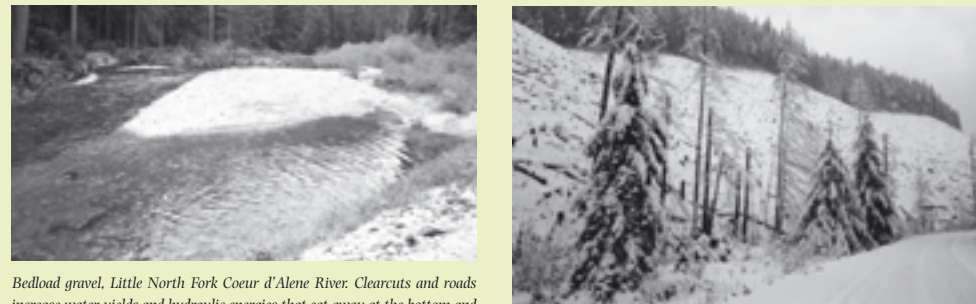
These side-by-side photos show the extent of the damage to this National Forest over about 60 years. The Coeur d'Alene National Forest—once a trophy hunting and fishing area—is now severely damaged. In 2005 the nation marks the hundredth anniversary of the transfer of the National Forests to the U.S. Forest Service.



1935 Coeur d'Alene National Forest, few clearcuts and almost no logging roads. 1997 extensive clearcutting, logging roads and almost no logging roads.

Now the watershed is unraveling, and the geologic forces at work are Forest Service clearcuts and logging roads. The damaged forests can not hold onto the water, releasing floods. The Forest Service refuses to acknowledge the

100 million tons of toxic waste sitting at the bottom of the watershed. The resulting "toxic floods" carry lead and other heavy metals into Lake Coeur d'Alene and the Spokane River, polluting Washington State waters.



Bedload gravel, Little North Fork Coeur d'Alene River. Clearcuts and roads increase water yields and hydraulic energies that act away at the bottom and sides of streams. The resulting bedload moves downstream. Once deposited, the bedload causes streams to fill in and widen, redirecting the flowing water into the stream banks. The result is further damage. More bedload is produced.

Clearcut filled with snow, Coeur d'Alene National Forest. Much of the Coeur d'Alene National Forest is located in elevations called "rain-on-snow belts". The sudden release of water occurs when warm winter weather events melt accumulated snow. Water yields are increased by removal of forest canopies ("even-aged" management) and logging roads that disrupt water tables and channelize water from rapidly melting snow.

By removing more timber and increasing the risk for damage [the U.S. Forest Service is] also risking the rehabilitation efforts and risking the taxpayers funds. I recommend that the North Fork of the Coeur d'Alene River be placed under a moratorium from timber harvest, and that rehabilitation be completed along with at least 10 if not 20 years' regrowth on the vegetation before any timber removal.

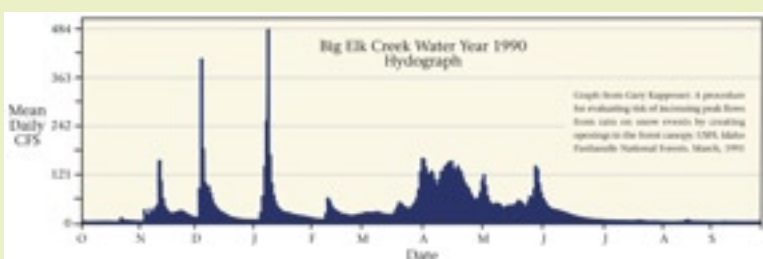
J. Allen Isaacson, former Supervisory Hydrologist for the Idaho Panhandle National Forests, referring to the Barney Rubble's Cabin and Skookum timber sales, letter to The Lords Council's Forest Watch, September 1993, attachment C, appeal of the Supplemental EA's for both sales.

### A procedure for evaluating risk of increasing peak flows from rain on snow events by creating openings in the forest canopy

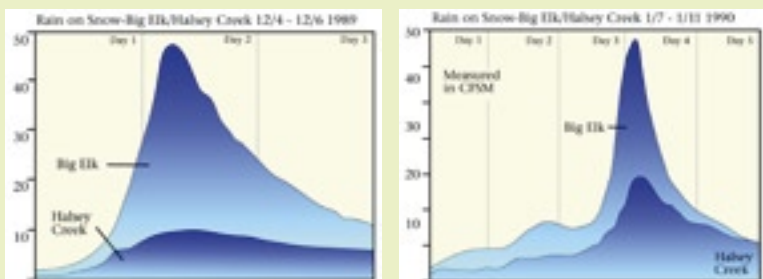
Gary Kappesser, Forest Hydrologist • Idaho Panhandle National Forests • March, 1991

Some of the largest and most damaging flood events in north Idaho have occurred in November through February from "rain on snow" events. Warm Pacific maritime air masses moving into the area provide the moisture and energy to rapidly melt existing snowpacks. Latent heat of condensation is liberated as the water vapor in the warm moist air condenses at the snow surface. Rate of heat liberation is a function of wind velocity at the snow surface to provide a continuing source of water vapor. Large openings in the forest canopy

created by timber harvest can result in significantly increased wind velocities at the snow surface. This will produce an altered hydrologic response with higher flood peaks, shorter times to rise, and shorter recession. The result may be destabilized stream channels with increased bedload transport. The risk of increasing peak flows through timber harvest may be evaluated in terms of significant causal factors. These include elevation ranges, size of opening created in the canopy, percent crown cover removed, and a combination of aspect and slope.



Compare the 3 short bursts of intense runoff during the winter with the sustained high runoff during the spring melt. "rain on snow" exceeds spring runoff by a magnitude of 4. "Rain on snow" storm events caused the high water yields during the winter. Stream energy is much, much higher during the "rain on snow" peak flow because the relationship of stream flow (shown here) with stream energy is logarithmic.



Compare the stream flows from an extensively clearcut stream (Big Elk Creek about 50 percent clearcut equivalent acres) with a stream logged previously and now with forest canopy regrowth and hydrologically recovered (Halsey Creek). For comparative purposes, stream flows are expressed in units of "CFSM" or cubic feet per square mile.

Recurrence Interval*	CSFM	YEARS
6.21	1.01	1.05
8.23	1.11	1.11
9.59	1.11	1.11
11.82	1.25	1.25
16.25	2.00	2.00
22.72	5.00	5.00
26.97	10.00	10.00
32.31	25.00	25.00
36.25	50.00	50.00
40.17	100.00	100.00
44.09	200.00	200.00

Water flows on Halsey Creek (forest canopy intact) occurred with a likelihood of an annual event (recurrence interval of 1) on December 5, 1989, and 12-15 years on January 10, 1989. Peak flows for Elk Creek (clearcut) occurred with a frequency of once every 200 years on December 5, 1989, and once every 200+ years on January 10, 1990. Indeed, the peak event of 70 CFSM is significantly off the charts, and perhaps in the range of a flood event occurring every 500-1000 years.

\* Data from Shoshone Creek on the North Fork of the Coeur d'Alene River near Pritchard, Idaho, appended to Gary Kappesser, A procedure for evaluating risk of increasing peak flows from rain on snow events by creating openings in the forest canopy, USFS, Idaho Panhandle National Forests, March, 1991. CFSM = Cubic Feet per Square Mile.



Confluence of the North Fork and South Fork of the Coeur d'Alene River. The North Fork's history and watershed are dominated by U.S. Forest Service logging with resultant floods. The South Fork's history and watershed are dominated by mining, with the resultant toxins. The co-mingling of waters is a metaphor for the coming together of two histories—logging and mining—that are the genesis of the toxic floods of the Coeur d'Alene River.

### KILLING FIELDS

100 million tons of toxic media covering 14,000 acres of wetlands



Lead is a pathogen for swans as it is for humans. Lead paralyzes the swan's ability to swallow, and it slowly starves to death in the midst of plenty. Biologists call these wetlands upstream of Lake Coeur d'Alene the "killing fields".

Specifically, the Feasibility Study includes the basin except for the North Fork of the Coeur d'Alene River.

Little sediment is transported through Coeur d'Alene Lake except during flood events.

These weather patterns make the Basin one of the highest precipitation areas of the Upper Columbia River Basin and can lead to flooding, especially when winter rainfall occurs on top of snow conditions.



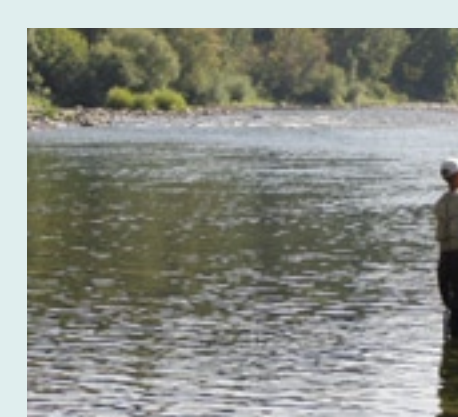
Flood, Coeur d'Alene River, 1974. Flood waters carry millions of pounds of lead into Lake Coeur d'Alene, and on into eastern Washington waters.

The impacted floodplain sediments, in particular, also act as 'secondary' metal sources that impact the other media. Directly or indirectly, the impacted floodplain sediments are the major source of metals in basin waters, the major source of metal exposure risks to ecological receptors and a major source to humans, and a major source of potential future recontamination of downstream areas that are cleaned up. The estimated mass and extent of impacted site media—primarily sediments—exceeds 100 million tons dispersed over thousands of acres.



Toxic swirl where the Coeur d'Alene River flows into Lake Coeur d'Alene. In a single day of the February 1996 flood, the USGS calculated that 1.4 million pounds of lead flowed into the lake. The lake is an inefficient trap for metals, and releases mine wastes downstream, polluting the Spokane River and Washington waters.

Researchers have confirmed their suspicion that a muddy springtime plume cruising across Lake Coeur d'Alene carries Silver Valley mining pollution to Spokane. The 30-foot-deep plume carried one-third of the lead it picked up from the Coeur d'Alene River into the Spokane River, according to the U.S. Geological Survey.



Trout Fishing, Spokane's West Central Neighborhood. The Spokane River is one of America's unique urban trout fisheries. Trout depend on cold, clean water from the Aquifer. Depleting the Aquifer threatens to destroy Spokane's prized fishery. Toxic metal pollution is less of a problem further from the Idaho border, allowing for one fish meal per month. Anglers increasingly advocate the fishery be designated "catch and release" to protect human health and the fishery.

## SOUTH FORK, COEUR D'ALENE RIVER

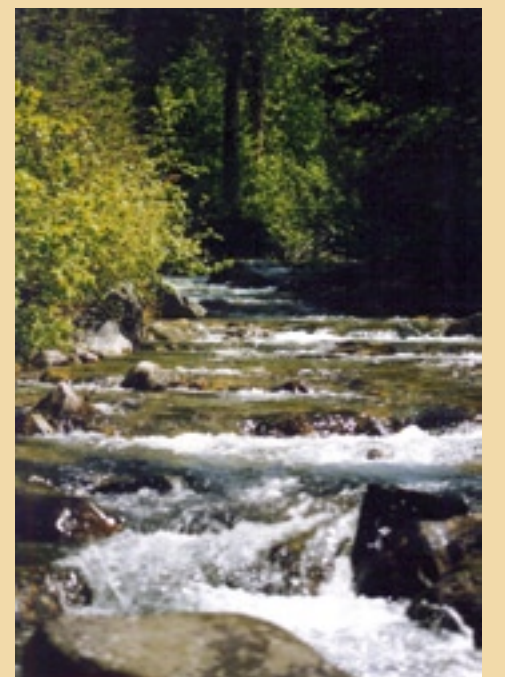
### TOXIC MINE WASTES

Over 60 million tons of toxic mine waste

Mining within the Coeur d'Alene Basin began more than 100 years ago. The basin has been one of the leading silver, lead, and zinc-producing areas in the world, with production of approximately 1.2 billion ounces of silver, 8 million tons of lead, and 3.2 million tons of zinc (Long 1998). The region surrounding the South Fork has produced over 97 percent of the ore mined in the basin (SAIC 1993). The Bureau of Land Management (BLM) has identified nearly 900 mining or milling-related features in the region surrounding the South Fork (BLM 1999).

An estimated 62 million tons of tailings were discharged to streams from the beginning of ore processing in 1884 until discharge to streams was discontinued in 1968. The tailings contained an estimated 880,000 tons of lead and more than 720,000 tons of zinc (Long 1998).

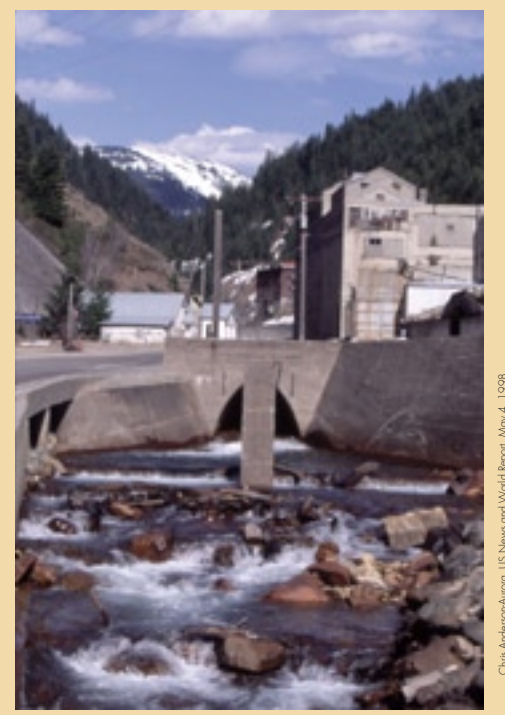
By the 1950s, mine tailings piped from the river covered 2,000 acres of the Cataldo Mission Flats to an average depth of 25 to 30 feet. Sediment dredging, pumping 7,000 gallons of water per minute, and excavating some 500 tons of contaminated river sediments per day continued until 1968. Approximately 72 million tons of this sediment contaminated with mine tailings have been discharged into the Coeur d'Alene River (Krieger 1990, Weston 1989).



Hecla Mine on Canyon Creek, tributary to the South Fork of the Coeur d'Alene River. Canyon Creek above Hecla Mine is a pristine forest stream; below, sterile with mine wastes.



Blowing up the 715-foot-tall smoke stack at the Bunker Hill lead smelter, May 26, 1996. The once-dreaded mountainsides are beginning to recover.



Hecla Mine on Canyon Creek, tributary to the South Fork of the Coeur d'Alene River. Canyon Creek above Hecla Mine is a pristine forest stream; below, sterile with mine wastes.

## LAKE COEUR D'ALENE

One of the most beautiful lakes in the world transformed into a mine tailings pond



On the surface, Lake Coeur d'Alene looks like the perfect postcard, its cool waters shimmering beneath a rolling green carpet of trees. But beneath the water lies a graphic portrait of environmental devastation, according to a four-year study that will be released today. Government scientists found an estimated 75 million tons of toxic mining waste coating the lake bottom. The result is a 25-mile-long dead zone where no organisms can survive. The U.S. Geological Survey would not release its findings until today, but several sources in the Coeur d'Alene Basin Interagency Group said the final report from The U.S. Geological Survey supports preliminary data released in April 1992:

- Heavy metals such as lead, cadmium, arsenic and mercury are encased in sediment. But continued increases in nutrients, such as fertilizers and runoff, and decreases in oxygen a total process called eutrophication—could unleash the toxic metals into the water column. That would threaten fish & other aquatic life.
- Zinc already has oozed into the water column and exceeds federal standards.

Age-dating studies trace the birth of the toxic, muddy layer to a century ago. Hard-rock mining began in the region in the 1880s.

The mining waste lying beneath Lake Coeur d'Alene includes an estimated \$200 million worth of silver. But the environmental consequences and cost of extracting the mineral would far exceed its value. Conventional extraction methods such as a suction dredge could cost \$1 billion.

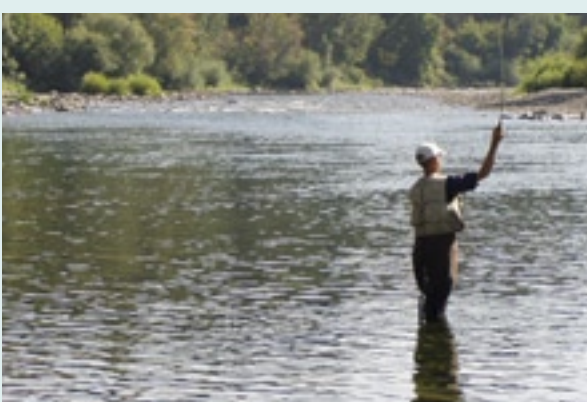
90% of the heavy metals that leach into the lake today originate in the chain lakes region south of Cataldo. Waste washed downstream over the last century and accumulated on the floodplain. That means most of the government cleanup efforts upstream of Cataldo are missing the source.

It's probably the most contaminated lake in the United States and ranks among the most contaminated in the world," said Howard Funke, an attorney for the Coeur d'Alene Tribe.

J. Todd Foster, "Toxic waste covers bottom of lake CdA" Spokesman-Review, December 8, 1993

## SPOKANE RIVER

The global community came to the banks of this river for Expo '74 to celebrate the first environmental world's fair



Trout Fishing, Spokane's West Central Neighborhood. The Spokane River is one of America's unique urban trout fisheries. Trout depend on cold, clean water from the Aquifer. Depleting the Aquifer threatens to destroy Spokane's prized fishery. Toxic metal pollution is less of a problem further from the Idaho border, allowing for one fish meal per month. Anglers increasingly advocate the fishery be designated "catch and release" to protect human health and the fishery.

- We believe –**
  - That the universe is a grand design in which man and nature are one.
  - That planet earth, a small part of the universe, is the residence of mortal man whose needs and aspirations are limited by the finite resources of planet earth and man's own finite existence.
  - That man is the custodian of his environment as the environment is the custodian of man.
  - That man, in his growing wisdom, will renounce the age-old boast of conquering nature, lest nature conquer man.
  - That the skies and the seas and the bountiful earth from which man draws his sustenance are the preserves of all mankind and that in the brotherhood they derive from nature, the nations of the earth will join together in the preservation of the fragile natural heritage of our planet.

- We believe –**
  - In the restoration of the reverence of nature which once filled our own land where the American Indian roamed in respectful concert with his environment.
- We believe –**
  - That the human spirit itself must set its own limitations to achieve a beauty and order and the diversity that will fill the hearts of the children of the world with a new and happier vision of their destiny.
  - That from this City of Spokane there goes forth today to the world the message and challenge that the time of great environmental awakening is at hand.

Delivered by Darryl Kaye, May 4, 2004, before 85,000 people gathered at Spokane Falls, William T. Youngs, The Fair and the Falls: Spokane's Expo '74, EWU Press, 1996



This human health advisory sign is posted along the banks of the Spokane River just downstream from the Idaho-Washington state line.



Swimmers enjoying the beaches of the Spokane River.