ROADED LANDS, ERODED HABITAT

Findings and Implications of the Roads Scholar Project 1994-1997

PREDATOR PROJECT

April 1999

Roaded Lands, Eroded Habitat

Findings and Implications of the Roads Scholar Project, 1994-1997

TABLE OF CONTENTS

We gratefully acknowledge the support of the following foundations for funding the Roads Scholar Project's field inventory work from 1994 - 97 and this report: The Brainerd Foundation, The Bullitt Foundation, the Global Environment Project Institute, the Harder Foundation, The Lazar Foundation, The Norcross Wildlife Foundation, the Northwest Fund for the Environment, The Strong Foundation for Environmental Values, and The Turner Foundation.

This report was written and prepared by David Havlick, Roads Scholar Project Coordinator from 1995-1998, with editorial assistance from Predator Project staff McCrystie Adams and Tom Skeele. We also appreciate editorial review and research materials provided by Bethanie Walder, Wildlands Center for Preventing Roads, and Marion Hourdequin. It was printed in April, 1999.

Cover Photo by Bill Haskins, Ecology Center

For more information contact: Predator Project, P.O. Box 6733, Bozeman, MT 59771; predproj@avicom.net; 406-587-3389; or visit our website at www.wildrockies.org/predproj.

printed on recycled paper

Executive Summary

Roads and motorized vehicles pervade much of the national forest land in the United States' Northern Rockies. Predator Project developed the *Roads Scholar Project* in order to address the impact of excessive road miles on ecosystem integrity. Numerous studies show that a variety of species—ranging from native plants to grizzly bears to amphibians—are negatively affected by roads; for most native species, as road density increases, habitat quality and security drops. Roads can affect both plant and animal species in a variety of ways. For example, roads:

- √ Reduce secure habitat by fragmenting roadless areas; roads can act as a migration barrier between large habitat blocks by separating and isolating these critical areas from each other.
- √ Cause direct habitat loss by altering the land with a long, narrow disturbance that creates a corridor along which non-native plants and animals can extend their range.
- √ Alter the hydrology of an area by converting subsurface flow into more erosive surface channels; roads also trigger landslides and can create massive erosion problems as well as restrict the passage of fish with poorly designed culverts and stream crossings.
- √ Allow humans increased access into otherwise remote areas, which leads to increased levels of mortality either directly (road kills) or indirectly (hunting, trapping, poaching, etc.).
- √ Force many species to modify their behavior in order to avoid unnatural breaks in the landscape, or to avoid human activities and the risks of habituating to humans.

National Park Service photo

The grizzly bear (*Ursus arctos*) is one of many species sensitive to roads and motorized access.

Few wildlife species actually benefit from the existence of roads, and those animals or plants that do benefit are often non-native invaders. Roads also alter natural processes such as the movement of water through an area. Road-generated sediments can negatively affect fisheries and smother spawning beds. Simply put, there is nothing in a natural system that acts like a road. In order to sustain functioning and healthy natural processes, roads need to be kept to a minimum. The US Forest Service is the world's most prolific road-builder, with a road system that now spans more than 430,000 miles.

In 1994, Predator Project started conducting on-the-ground inventories on national forest lands in the Northern Rockies in order to acquire the best possible data on the Forest Service's roads network. During 1994-95, "Roads Scholars" drove, bicycled, and hiked 17 wildlife management units important

Roads Scholar Project photo

More than 60,000 miles of user-created "Ghost Roads," such as these on the Targhee National Forest, have eluded agency inventories nationwide.

to grizzly bears, elk, lynx, and other wildlife from northwestern Wyoming to eastern Washington. During 1996-97, we also surveyed two Idaho watersheds important to bull trout and salmonids in an effort to quantify road densities and document road-related erosion problems such as landslides and blown-out culverts.

On the 17 grizzly bear and elk management units we ground-truthed in 1994 and 1995, Roads Scholars documented:

- More than 305 miles of ghost roads that were not accounted for by agency inventories.
- Only 48% of the road closures effectively blocked motorized access.
- 128 of the 343 *effective* road closures still showed signs of motorized use beyond the otherwise effective closure (e.g., a gate may have been in place and locked, but people with a key or combination were still using the road beyond the closure point).
- Because of ghost roads and ineffective road closures, 524 more miles of open roads existed than the US Forest Service claimed.
- Open and total road densities on the ground were consistently higher than agency figures.
- Only 54% of the habitat within these 17 management units was considered secure from the negative influence of road-related human activities.

Important findings from *Roads Scholar Project* watershed inventories include:

- On the Wild and Scenic St. Joe River in northern Idaho, Roads Scholars documented 131 landslides that occurred directly above or below roads. Several of these were severe enough to divert stream courses and dump large amounts of sediment into tributaries and the main channel of the St. Joe.
- On the North Fork of the Boise River in central Idaho, Roads Scholars inventoried a 119-square-mile area and documented 23 significant road failures, including landslides and blown-out culverts.
- Road density in the North Fork Boise project area *averaged* 3.8 miles/square mile of land, approximately twice the level considered harmful to elk habitat.

From our *Roads Scholar Project* inventories, we have learned two important points:

1) The US Forest Service roads database does not reliably and accurately reflect conditions on the ground. This is a problem because the Forest Service continues to authorize further road building, logging and other developments based on the false assumption that they have accurately mapped all roads and that all existing road closures are effective. As a result, the agency consistently fails to provide sufficient secure habitat for wildlife.

2) To date, the US Forest Service's efforts to limit motorized access are not successful. While Forest Service personnel often claim that ineffective road closures do not equate to improper access, we have found that many ineffective closures do receive

motorized activity. Motorized use and administrative access behind gates is sometimes not even monitored.

Predator Project recommends that Congress, the US Forest Service, and the American people take the following steps to help remedy road-related problems:

CONGRESS:
• Pass legislation to protect remaining Federal roadless lands greater than 1,000 acres as Wilderness;
• Remove purchaser road credits from the Forest Service's budgeting process and disburse these funds to agencies for habitat restoration projects, road removal and obliteration, and scientific monitoring and analysis;
• Support efforts to reform agency timber management programs that remove incentives for commercial logging and road-building.

US FOREST SERVICE:
• Improve and make permanent the 18-month moratorium on road-building in roadless areas, announced in February 1999;
• Adopt a policy to build no new roads anywhere on national forest lands—this will shift many engineering and local jobs from road construction or timber harvest to road obliteration and habitat/watershed restoration;
• Improve maintenance and stream crossings for routes that remain an important part of the forest road system;
• Increase monitoring and enforcement of road and area closures.

AMERICAN PEOPLE:
• Participate in identifying and monitoring road closures, ghost roads and other road-related problems on national forests;
• Help inform other citizens, agency decision-makers, and elected officials about the conditions of our public lands and how these conditions affect fisheries, wildlife and people;
• Express your support to agency decision-makers and elected officials for protecting wildlife and fisheries on our public lands;
• Join Predator Project and other groups to participate in volunteer road obliteration and habitat restoration projects.

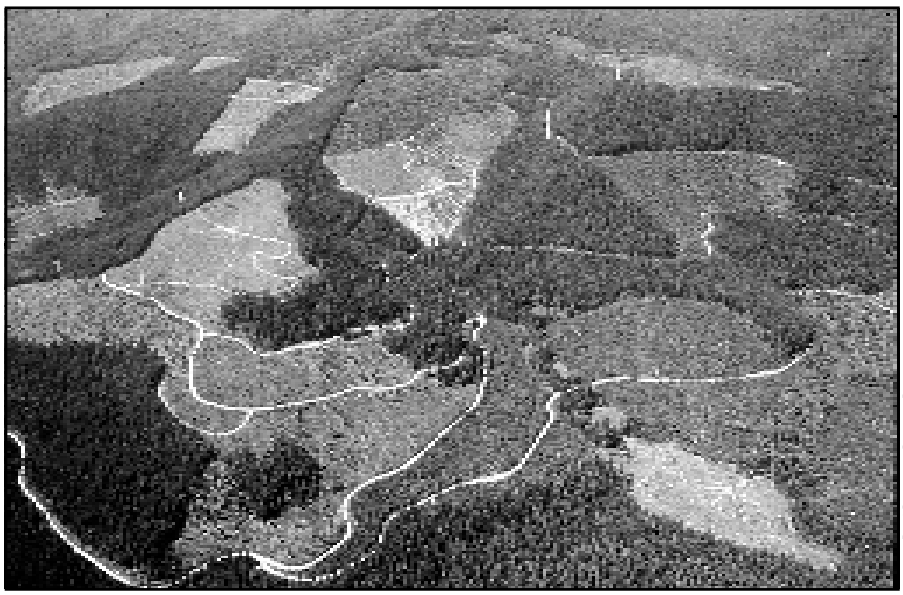
Wildlands CPR photo

Volunteers work with the Gallatin National Forest in Montana to close a road and correct erosion problems.

Introduction

A loud screech pierces the Northern Rockies sky. A red-tailed hawk soars overhead, circles and rises on warm summer air. The hawk scans for a careless rabbit, a morsel of mouse, sleeping pocket gophers. Wheeling high above some of North America's most fabled wild country, the hawk sees.....fragments.

On national forests in the Northern Rockies, more than 50,000 miles of road now crisscross and fragment what once seemed an unbroken land of forests and mountains. For many animals, such as elk and bear, roads pose a hazard from legal hunting, illegal poaching, and lost habitat. Noise and exhaust from motorized vehicles on roads and trails can disrupt animal behavior, cause abandonment of nests or dens, and stress individuals struggling to find food during lean months.



Mark Alan Wilson photo

Roads often lead to increased forest fragmentation—clearcuts in northwest Montana.

Fish-eating kin of the hawk—ospreys, bald eagles, heron, or kingfisher—may notice that roads also affect the waters of the land. Roads dump topsoil, sand and fine sediments into streams where trout and salmon lay their eggs. When these spawning areas fill with sediment, fish reproduction falters. In areas with unstable soils, roads periodically collapse in massive landslides. In recent years landslides in heavily roaded areas have clogged major river channels, ruined highways, destroyed homes, and even claimed human lives.[1]

Although most of us likely think of roads in the familiar setting of country lanes, interstate highways, or the streets that lead to our homes, there are in fact an overwhelming number of national forest roads that cause a great deal of ecological harm, cost millions of dollars to build and maintain, and far too often, no longer provide any real service to anyone. In its latest figures, the US Forest Service estimates that on the public lands it manages there are more than 430,000 miles of road—enough road to wrap around the earth nearly 18 times at the equator, and roughly 10 times the distance of the US Interstate Highway system.[2]

"Roaded Lands, Eroded Habitat" provides a careful look at roads and motorized use on public lands in the Northern Rockies region of eastern Washington, northern Idaho, western Montana, and northwestern Wyoming. The intent and scope of this report are severalfold:

- First, we explain some of the major reasons roads cause problems for wildlife, the land and its waters.
- Second, we explore the relationship between roads and the US Forest Service: why roads exist on national forest lands,

what the agency has done thus far to manage its extensive road system, how current practices make poor economic sense, and where agency efforts to manage roads have come up short.

- Next, we describe why Predator Project initiated the *Roads Scholar Project,* how this project addresses current problems with roads on public lands, and what specific results we have found with our inventories.
- Finally, we recommend actions for the coming months and years to repair and restore the essential wildlife and aquatic habitat that roads continue to erode across the region.

Roads Scholar Project photo

When maintained properly, gated roads remain available only for administrative and non-motorized use.

If you are a citizen activist, an agency official, a journalist, an outdoor enthusiast, or an elected official, you will learn something by reading this report. In addition, whether you are well-versed in public land issues or a relative newcomer, we hope that you will contribute your voice to the local, regional, and national debate that continues to swell over wildland roads, how our public lands should be managed, and what kind of legacy we will leave for future generations.

Notes

[1] *Road-RIPorter*, v. 2, no. 1.

[2] USDA-FS, 1998. Administration of the Forest Development Transportation System: Temporary Suspension of Road Construction in Roadless Areas.

David Havlick photo

Roadless land in Idaho provides a haven for fisher, elk, mountain goats, and clean waters. Preserving roadless land as Wilderness will protect these still-vulnerable areas from logging, roadbuilding, and mining for generations to come.

What's Wrong With Roads?

Gertrude Stein once said, "A rose is a rose is a rose is a rose." Unfortunately, what may hold true for certain fragrant blooms does not remain so for roads. Depending on where a road exists, how it is built, what kinds of use it receives, and other factors including soil type, climate, and vegetation, some roads are better—ecologically, economically, or functionally—than others.

Since this report focuses on roads and motorized use on the public lands of the Northern Rockies, it is important to clarify several points right away. The vast majority of the roads we discuss in this report are gravel or natural soil surfaced roads, not paved. Lacking large cities in most places, the public lands of the Northern Rockies tend to receive concentrated seasonal use from hunters, snowmobilers, or other recreationists, and sporadic heavy industrial use by commercial timber or mining corporations, rather than reliable daily use or a steady flow of traffic from suburban commuters.

The importance of these distinctions grows clear when we look at problems caused by roads. While the direct effect of roads on wildlife can be staggering on paved highways where speed truly does kill—the Humane Society estimates that one million animals die *every day* on US roads[1]—vehicle collisions are somewhat less frequent and less lethal on winding dirt roads. On the other hand, erosion from unpaved road surfaces far exceeds that of paved streets.

Roads on our national forests create a number of effects that are typically less direct than roadkill but ultimately cause devastating effects on wildlife and the habitat they need to survive. Impacts to native plant and animal species include the following, and often occur in concert:

1) Roads reduce secure habitat by dissecting roadless lands and interrupting animal migration corridors. When a previously unbroken forest is disrupted by a road, the break in tree cover eliminates shade and increases the amount of sunlight that reaches the forest floor. Forest fragmentation, which transforms large chunks of habitat into smaller pieces, works against species such as pine marten, fisher, owls, goshawk, and songbirds who depend upon the forest interior for food and shelter.[2]

2) Roads change forest habitat in a way that allows foreign plants, animals, and pathogens to invade.[3] The increase in edge habitat—where roads interrupt the landscape and create sharp transitions from forest canopy to open clearings—allows brown-headed cowbirds, starlings, white-tailed deer and other aggressive opportunists a foothold at the expense of native species. Noxious weeds such as leafy spurge, Russian thistle, or spotted knapweed typically thrive along these disturbed road edges and outcompete native plants.[4]

USFS file photo

Roadkill, such as this black bear, is an obvious cause of direct mortality on roads.

Roads also provide an easy corridor for non-native weeds or plant pathogens to extend their range as vehicles or passers-by provide transport.

A washed-out road in the Boise National Forest, Idaho. *RSP Photo*

3) Roads cause direct habitat loss by creating a long, narrow, unnatural disturbance. With 430,000 linear miles of road on national forest lands, the total amount of cleared land *just from the roads* consumes an area larger than Rhode Island.[5] Consider clearcuts or other impacts from industrial uses of roads, and habitat destruction escalates still further.

4) Roads alter the hydrology of an area and adversely impact fisheries. Bare road surfaces create an obvious source for increased erosion and sediment running off to streams, but even overgrown roads with no motorized use create a horizontal break in the natural flow of water beneath the surface. In sandy soils, common in the Rocky Mountains, heavy rainfall or rapid snowmelt intersecting old roadbeds often triggers massive landslides or road failures, which wash tons of topsoil, trees, and debris downhill. Roads convert subsurface water flow into surface channels.[6]

By bringing additional water to the surface and increasing the speed of that water, soil erosion increases. Increased sediment levels from road erosion can smother spawning gravels, destroying crucial habitat for fish reproduction. In addition, culverts and bridges alter the flow of water and often restrict the passage of fish. Roads can also increase the duration and magnitude of peak runoff levels in watersheds.[7]

5) Roads force many species to modify their behavior in order to avoid unnatural breaks in the landscape or human interactions and the risks associated with them. This "displacement" not only takes the animals away from places they may need to be (many species require some degree of solitude for denning sites, for example), but also causes animals to waste valuable energy fleeing from noise and the humans that use roads. Species such as grizzly bear, elk, and wolverine can be displaced by roads for distances greater than 0.8 mile.[8]

6) Roads allow humans increased access into otherwise protected, secure habitats. This leads to increased animal mortality, both directly (road kills) or indirectly (hunting, trapping, poaching). Roads affect different types of animals in different ways. For large animals, such as bear and elk, the presence of a road causes less of a problem than the type and degree of use it receives. Studies show that the majority of grizzly bear deaths occur within one mile of a road.[9] Bear deaths typically occur following a human interaction—whether from a poacher's bullet, a wildlife officer's "disposal" of a "problem bear," or direct impact from a car or train—and the vast majority of these only take place with the help of road access.[10] Elk mortality also relates directly to roads, and many of these animals learn to avoid roads and the hunters who use them.[11]

7) Roads present a physical barrier. For small animals, such as red-backed voles, pocket gophers, leopard frogs, and others who use cover for camouflage or protection, a road's twenty to thirty feet of bare soil can present a migration obstacle that they simply will not cross. Those that do try to cross face a high risk of predation from raptors and other visual feeders who can spot animals trying to scamper across a roadbed. For slow-moving animals, even low volume traffic can be prohibitively deadly: one study found that 26 cars per hour caused 100% mortality for toads trying to make it from one side of a road to the other.[13]

Notes

[1] Humane Society of the US, Urban Wildlife Research Center.

[2] R.F. Noss, "The Ecological Effects of Roads." *Road-Ripper's Handbook*, Wildlands CPR, Missoula, MT. 1996.

[3] Ebersberger, *The Road-RIPorter*, January/Feb. 1998, v. 3, no. 1, "Roads and Exotic Plants, Pests and Pathogens."

[4] Ebersberger, 1998.

[5] Assuming an average road width of twenty feet, 430,000 miles of road represents 1.04 million acres of cleared land, or 1628 square miles. Rhode Island is 1214 square miles.

[6] Megahan and Kidd, "Effects of logging and logging roads on erosion and sediment deposition from steep terrain." *Journal of Forestry*, March 1972, pp. 136-141.

[7] Jones and Grant, "Peak flow responses to clear-cutting and roads in small and large basins, western Cascades, Oregon. *Water Resources Research*, vol. 32, no. 4, pp. 959-974. 1996.

[8] Forman et al., "Ecological effects of roads: toward three summary indices and an overview for North America." In press: *Habitat Fragmentation and Infrastructure*. Canters, K. ed. 1996.

[9] Dood, A.R., R.D. Brannon, and R.D. Mace, 1986, Final Programmatic Environmental Impact Statement: The Grizzly Bear in Northwestern Montana, Montana Department of Fish, Wildlife, and Parks, Helena, MT.

[10] McLellan, B. and R.D. Mace, 1985. "Behavior of grizzly bears in response to roads, seismic activity, and people," British Columbia Minister of the Environment, Fish and Wildlife Branch, Cranbrook, B.C.

[11] Lyon, 1983. "Road density models describing habitat effectiveness for elk. *Journal of Forestry* 81: 592-595.

[13] Heine. 1990. *Biological Conservation* 54:239-249.

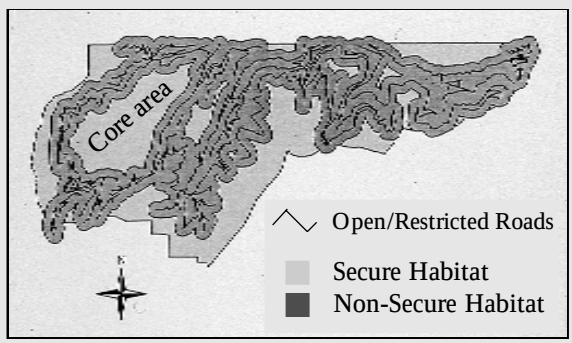
What Is Habitat Security?

Many species of wildlife depend upon areas of land or water that are relatively isolated from human disturbances such as roadbuilding, logging, mining, or hunting. Grizzly bear, wolverine, elk and others are particularly sensitive to human activities and need these "secure" areas in order to find food, den, and reproduce.

Roads are one of the main causes of reduced habitat security, since people typically use roads in order to hunt, log, or drive through forested areas. Studies have found that many species do not use areas near roads as often as they would if there were no roads or no motorized use of the roads.

The map shown below illustrates the effective displacement caused by roads in a grizzly bear management unit in Northern Idaho: for a given distance on either side of the roads that receive motorized activity, the habitat in this area is no longer considered "secure."

Notice how "core areas" without roads can become isolated from each other. This fragmentation can create problems by limiting genetic richness and causing these isolated populations to be more vulnerable to sudden extinctions. For this reason, many conservationists support the protection of habitat corridors that connect secure core areas and provide some lasting connection between populations.



For a wide range of animals, from wolves to trout, high numbers of roads in a given area lead to increased mortality and decreased populations. Road density, which is often measured as miles of road per square mile of land, can provide an important standard for land managers to abide by when trying to conserve sensitive or threatened species and populations.

The amount of intact forest also affects factors including water and soils, which can then determine what types of plants and animals may thrive. Many species that depend upon the forest interior suffer dramatic population declines when roads or clearcuts open up large blocks of previously forested land.

The Forest Service and Roads

The United States Forest Service (USFS) manages a majority of the public land in the Northern Rockies and 191 million acres of land nationwide. And yet, most Americans know little about this agency, what it does, or how it operates. In this section, we examine the relationship between the US Forest Service and the 430,000 road miles on national forest lands. Specifically, we address:

- why roads exist on National Forests;
- how the agency administers its vast road system;
- where and in which ways Forest Service road management currently makes—or fails to make—ecological and economic sense.

While the agency's motto continues to be, "Caring for the Land and Serving People," throughout the West the bureaucratic lifeblood of this agency has been timber harvesting. Beginning in World War II, timber harvests on national forests climbed steadily to a level of billions of board feet per year.[1] In order to get to the trees, people built roads. Years later, along with young trees or stumps, the roads remain.

Purchaser Road Credits

In the Northern Rockies, most national forest roads were originally built to access timber. The Forest Service often contracts road building out to the purchaser of the particular timber sale. As part of the negotiated timber sale price, the Forest Service applies a "Purchaser Road Credit" to cover the costs of constructing any roads necessary to access the sale area. This Purchaser Road Credit, which varies from sale to sale but generally ranges from $40,000-$150,000 per mile in the Northern Rockies, is deducted from the price of the trees bought in the sale.[2]

For example, a particular timber sale might include 5 million board feet (mmbf) of trees and ten miles of new road construction. With timber selling for $200 per 1000 board feet (mbf), Corporation TRZ4Free might owe $1 million for the timber.[3] The USFS would then assess a purchaser road credit for the ten miles of road. At $95,000/mile, this credit amounts to $950,000, which is then deducted from the sale price. Corporation TRZ4Free pays the Forest Service $50,000 for the sale, and then has the responsibility of building ten miles of road. If TRZ4Free is able to construct the road for only $60,000/mile, they would reduce their expense by $350,000 and purchase the timber for only $650,000. In some cases, logging contractors are able to buy and log trees for profit more because of the purchaser road credit than from the value of the timber.[4] In fact, the combination of the administrative costs of preparing a timber sale and the purchaser road credit often exceeds the amount the Forest Service receives for

Trees continue to roll out of America's national forests. *RSP photo*

timber sales, which results in below-cost timber sales. The road contract typically ends when the last trees are hauled out from the sale, leaving the Forest Service to manage and maintain the logging roads from that point forward. This process explains, in part, the proliferation of roads on national forests: there is a clear financial incentive for corporations to buy timber sales that include road contracts, and the Forest Service recognizes that sales with roads will be more attractive on the market.

User-created roads present an additional challenge for Forest Service management in places such as popular recreation areas along rivers or the open meadowlands found in many Montana and Wyoming national forests. Four-wheel drive vehicles, off-road vehicles, and motorcycles can quickly establish new routes for motorized access into places where wildlife formerly found solitude and safety from human activities. In January, 1998, the US Forest Service acknowledged that there are 60,000 miles or more of these uninventoried, user-created "ghost roads" on its lands.[5]

The Forest Service increasingly recognizes that too many roads and too much motorized access on the land causes problems for wildlife and fisheries. Most national forests in the Northern Rockies now have open road density standards which limit the number of roads that can legally remain open and available for motorized use. Unfortunately, the agency is not always able to manage its road system carefully or well.

Road Closures and Access

In an effort to limit motorized access, the Forest Service typically uses locked steel gates, earth berms, large boulders, or concrete posts to block road entrances. These barriers are often accompanied by a placard that describes the reasons for the closure, the types of use that are still allowed, and whether the closure is seasonal or year-long. Most Forests also offer visitors a travel map that illustrates open and closed routes, prohibited uses, and seasonal restrictions. There are, however, some serious problems with the Forest Service's road management. Many road closure devices, such as gates and earth berms, are easily detoured by off-road and four-wheel drive vehicles. Studies have found that even on grizzly bear habitat

Roads Scholar Project photo

Detours around gated roads allow motorized use even in areas managed to protect sensitive wildlife habitat.

in the Northern Rockies, where regulations are relatively strict, road closures only prevent motorized vehicles about 50% of the time.[6]

Motorized access is not the only problem. Neglected, overgrown roads continue to erode and contribute to water quality problems.[7] In some cases, the Forest Service loses track of how many roads exist on the land, or where roads were built.[8] This causes obvious problems in managing use or meeting road density requirements. Irresponsible forest users also create a disproportionate amount of damage, including the creation of new motorized routes. The agency allocates very little money to monitor violations or catch renegade users; even when rangers know about resource damage or illegal motorized use, they rarely have the money or the motivation to do much about it.[9]

Money

Beyond the established ecological problems with current road management, there are very real financial costs as well. Annual maintenance costs range from $50-$15,000 per mile of road.[10] Forest Service Chief Michael Dombeck recently cited a $15 million backlog of road maintenance projects on national forest roads.[11] On most ranger districts, vandalism to road closures and signs averages $1,500-$10,000 each year.[12] Noxious weed spraying, dust control, and hunting season patrols bring additional expenses. In an effort to counteract these costs, some timber contracts now require the purchaser to remove roads built to access sale areas. Other Forests are experimenting with specially-designed "roll-up roads," built so that they can be easily removed upon completion of the timber sale.[13]

With so many roads already on the land, however, Predator Project and many others question the sense of building new roads into the last sanctuaries of roadless habitat—or anywhere on national forests. What are the long-term ecological consequences? Does it make economic sense? How should our public lands be managed, and for what kinds of uses? Don't we already have far more roads on the land than people need or use?[14]

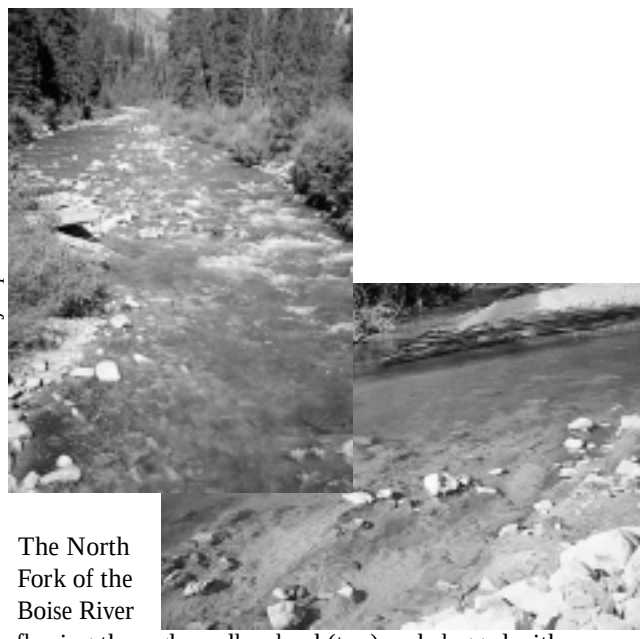
Notes

[1] Wilkinson and Anderson, *Land and Resource Planning in the National Forests*. Island Press. 1987.
[2] Sauerbier, Jim. 9 December, 1997. USFS Region One road engineer. Personal communication.
[3] ibid.
[4] Personal communication with logging contractor, Olive Cove, Tongass National Forest, Alaska. July 1994.
[5] USDA-FS, 1998. Administration of the Forest Development Transportation System: Temporary Suspension of Road Construction in Roadless Areas.
[6] Hammer, K. 1986. "An On-Site Study of the Effectiveness of the U.S. Forest Service Road Closure Program in Management Situation One Grizzly Bear Habitat, Swan Lake Ranger District, Flathead National Forest, Montana"; Platt, T. 1993. "Cabinet-Yaak Grizzly Bear Ecosystem Forest Service Road Closure Program Compliance Inventory"; RSP, 1994-1996.
[7] North Fork of the Boise inventory, RSP, August 1997.
[8] USDA-FS, 1998. Administration of the Forest Development Transportation System: Temporary Suspension of Road Construction in Roadless Areas; RSP 1994-1995.
[9] Susan Lamont, Hebgen Lake Ranger District, Gallatin National Forest, cites personnel shortages, budget constraints, and lack of public support as reasons why road closures and enforcement of travel regulations do not receive adequate agency attention. Personal communication, December 1997.
[10] Sauerbier, 1997.
[11] USDA-FS, 1998.
[12] RSP interviews with ranger district personnel on the Helena, Kootenai, Idaho Panhandle, and Colville National Forests, May 1997.
[13] Hegman, Skip, Lolo NF. "The Location, Design, Construction and Reclamation of Low Volume Roads." 1989.
[14] The Forest Service posed similar questions when, in January 1998, it called for an 18-month moratorium on road-building in roadless areas nationwide. While the moratorium proposal represents an important step by the USFS to examine its road policy, the terms of the agreement would exclude the vast Tongass National Forest in Southeast Alaska and others in the Pacific Northwest so these areas remain open to roadless incursions. The moratorium also does not apply to other extractive uses of the Forests (mining, helicopter logging, grazing, etc.) and only considers roadless parcels larger than 5,000 acres.

The Roads Scholar Project: Findings and Implications

The *Roads Scholar Project* began in 1994 after a pair of extensive field surveys demonstrated that two different national forests in Montana were not complying with their own regulations to protect grizzly bear habitat. When local citizen Keith Hammer first showed the Flathead National Forest in the mid-1980s that it had too many roads in prime grizzly bear habitat, and that only 62% of the road closures he surveyed were effective at keeping vehicles off the closed roads, agency officials balked. When Hammer produced a folder filled with data sheets and photographs documenting his findings, Forest officials had to acknowledge the problems, and eventually agreed to bolster closures and remove hundreds of excess road miles.[1] On the Kootenai National Forest in 1993, University of Montana graduate student Tom Platt conducted a survey of road closures and found that only 53% were effective at preventing motorized access.[2]

The results of these two studies, conducted by concerned individuals working on shoestring budgets, convinced Predator Project that there was a critical need region-wide to look at the way the Forest Service was managing its road system. Using methods adapted from the work of Hammer and Platt, we developed the *Roads Scholar Project* to inventory and assess the impacts of motorized access on the land and its wildlife. The *Roads Scholar Project* seeks to ensure that the Forest Service adopt ecologically-based road density standards, and subsequently, that the agency meet these standards.



Roads Scholar Project photos

The North Fork of the Boise River flowing through roadless land (top) and clogged with sediment in roaded areas downstream (bottom).

In 1994, Predator Project started conducting on-the-ground inventories on national forest lands in the Northern Rockies. Our goals were to acquire the best available data about the Forest Service's roads network, and advocate habitat restoration and road obliteration wherever possible and appropriate. In the years since, trained "Roads Scholars" have driven, bicycled, and hiked across seventeen wildlife management units important to grizzly bears, elk, lynx, and other wildlife on national forests from northwestern Wyoming to eastern Washington.

We have also surveyed two Idaho watersheds important to bull trout and salmonids, to quantify road densities and document road-related erosion problems such as landslides and blown-out culverts. Since 1994, we have also examined motorized use of trails, participated in procedural efforts that relate to roads and access, and worked to train other groups and individuals to conduct field inventories.

Results

In many areas of the Northern Rockies, roads are still *the* major factor that endanger species and prevent ecosystems from functioning in a healthy manner. With the *Roads Scholar Project*, Predator Project has documented two important points about roads

on national forest lands: more roads exist on the ground than the US Forest Service acknowledges, and the Forest Service consistently fails to close roads effectively.

Of the more than 5,000 miles of roads inventoried by Roads Scholars in the 1994 and 1995 field seasons, we found 305 miles or an additional 6% that were "Ghost Roads"—roads that had not been properly mapped or inventoried by the Forest Service. Compounding this problem, closure effectiveness was 63% in 1994 and only 40% in 1995. In all, more than half the closure points did not effectively prevent motorized use as planned[3] (Table 1). As a result, road systems that the Forest Service considered closed and "secure" wildlife habitat were still vulnerable to—and in many cases, actually receiving—motorized use.

Table 1: Road Closure Effectiveness in Wildlife Management Units, 1994-1995

CLOSURES	1994	1995	TOTAL
Not At All Effective	98	118	216
Does Not Restrict ORVs	25	167	192
Administrative Access	43	115	158
No Motorized Activity	168	74	242
Percent Effective	63%	40%	50%
Percent w/ No Use	50%	16%	30%
TOTAL #	334	474	808

Roads closed to protect wildlife habitat or reduce erosion often remain open or vulnerable to motorized use. *Roads Scholar Project* inventories have also found that even closed roads with no motorized activity can erode and collapse, dumping loads of sediment into nearby streams.[4] Because of the critical role that aquatic systems play in sustaining both fisheries and wildlife—including predators such as bear, weasels, and mink—in 1996 and 1997 we conducted watershed-based inventories to document road density and road-related erosion problems. One such study, on the North Fork of the Boise River in central Idaho, found:

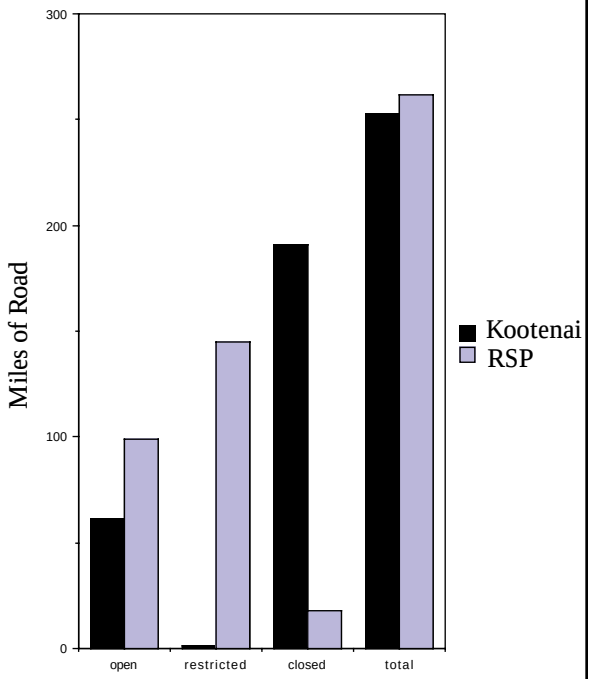
- More than 460 miles of road in only 119 square miles of this one watershed.
- 23 significant erosion events, including blown culverts and landslides.
- 97% of all roads had chronic erosion problems, including seasonal water channels, water flowing across road surfaces, or unstabilized slumping of the roadcut.
- Total road densities of 3.9 miles/square mile, or 244% of the average on USFS lands nationwide; two-thirds of these roads were open to motorized use.

Implications

A closer look at an inventory from a specific area highlights some of the problems with current Forest Service road management. In northwest Montana, the Spar grizzly bear management unit is part of the Cabinet-Yaak Recovery Area for grizzly bears. This area's grizzly population now has between 15-30 grizzlies, by most estimates, and is in immediate danger of extirpation. Although federal wildlife biologists remain hopeful that the bear population in the area is stable or growing, they acknowledge that *any* human-caused mortality of Cabinet-Yaak grizzlies may lead to the loss of the population.[5] Road and access management consistently emerge as the most important factors in controlling human-caused bear deaths. [6] Given this background, what degree of access management should we consider sufficient and appropriate?

The Kootenai National Forest identified 61 miles of open roads, 191 miles of closed roads and 34 road closures on the Spar in 1995. In June and July of that same year, Roads Scholars documented 99 miles of open road, 145 miles of restricted roads (roads that only excluded vehicles seasonally or larger than a certain size), and 18 miles of closed roads on the Spar. In sum, the *Roads Scholar Project* found ten miles of

Figure 1:
Road Access—Kootenai NF & RSP Inventories



Roads Scholars documented more open roads and fewer closed roads than the Forest Service had inventoried.

Ghost Roads on the management unit, as well as a significantly higher percentage of open and restricted roads (versus closed roads), than the Forest Service maps and travel plan indicated (Figure 1).

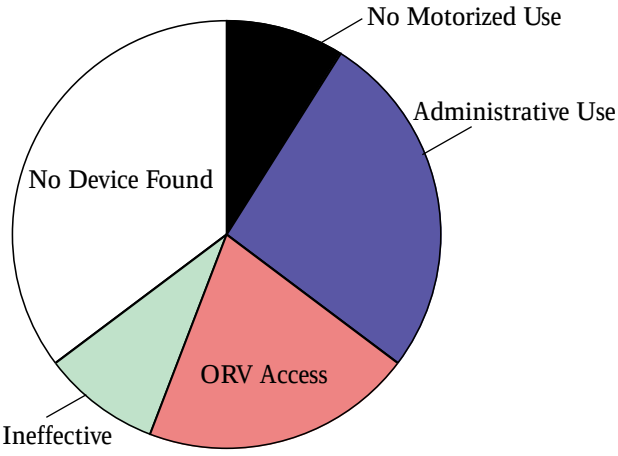
Of 34 closure points on the Spar, Roads Scholars found just 22 closures in place on the ground as indicated by Kootenai Forest travel plans and closure orders. Of these 22 closures, only 12 devices proved effective at preventing unplanned motorized use. Ten of the 22 closures were locked gates, and nine of these gated roads showed signs of administrative or other use.[7] Only 35% of the closures were functioning as planned, and 91% of the roads labeled "closed" by the Kootenai National Forest actually were receiving some form of motorized activity (Figure 2).

Admittedly, the sheer number of roads on national forest lands makes management a formidable task, but both federal law and common sense dictate that the US Forest Service—the agency responsible for building so many roads in the first place—rise to the challenge.[8] Ultimately it is not just the reputation or legality of this federal agency that is at stake, it is the continued survival of some of our nation's most cherished species and wildlands.

Notes

[1] Keith Hammer personal communication, Missoula, MT ROAD-RIP workshop, June 1, 1995.
[2] Platt, 1993.
[3] When administrative access through closed gates is factored in, closure effectiveness drops to 50% in 1994, 16% in 1995, and 30% overall. It is important to note that these figures serve as "snapshots in time" and that Kootenai NF personnel have been cooperative about making change.
[4] RSP N. Fork Boise River inventory, 1997; St. Joe River inventory, 1996-1997.
[5] Wakkinen, W.L. and W.F. Kasworm, 1997. Grizzly bear and road density relationships in the Selkirk and Cabinet-Yaak recovery zones. Unpublished briefing paper. U.S. Fish and Wildlife Service.
[6] US FWS, Grizzly Bear Recovery Plan. 1993; Wakkinen and Kasworm, 1997.
[7] The other twelve closure devices were earth berms, of which three were not effective at preventing motorized access of any type, six did not exclude off-road vehicles, and three were working effectively.
[8] National Forest Management Act, 1976; Endangered Species Act, 1973.

Figure 2:
Spar BMU Road Closures, Kootenai NF



Only 9% of the "closed" roads on the Spar grizzly bear management unit had devices in place that actually prevented all motorized access (black shading).

Prospects for Recovery, Proposals for Restoration

During the past four years of inventory work, Roads Scholars have documented numerous problems with access and road management on national forests in the Northern Rockies. These studies illustrate the critical need for improvements in Forest Service access management.

From our *Roads Scholar Project* inventories, we have learned two important points:

1) <u>The US Forest Service roads database does not accurately reflect conditions on the ground</u>. This is a problem because the Forest Service continues to authorize further road building and associated developments based on the false assumption that they have mapped all roads and that existing road closures are effective. As a result, the agency consistently fails to provide sufficient secure habitat for wildlife or water quality. An 18-month moratorium on road-building in roadless areas announced by the US Forest Service in February 1999 may portend an important and positive shift in managerial direction, but the moratorium still leaves far too much land vulnerable to road-building and far too much habitat unprotected. The Forest Service's plan to define a long-term roads policy presents a longer-lasting and broader opportunity for real and meaningful change. The terms and outcome of this policy remain undetermined at the time of this report.

RSP photo

An obvious detour of a gated road closure on the Gallatin National Forest in the Greater Yellowstone Ecosystem grizzly bear recovery area. Although this road is supposed to be closed year-round, a standard sedan can easily circumvent this gate and use the road.

2) <u>To date, the US Forest Service's efforts to limit motorized access are not working</u>. While ineffective road closures do not necessarily equate to improper access, we have found that many of these ineffective closures *do* receive illegal or unchecked motorized use.

A growing, well-funded lobby for motorized recreation increases the challenge to protect wildlife habitat and water quality on our national forests. As national forest timber revenues decline, the agency also grows more eager to find other sources of funding. If the current trend toward motorization continues without an accompanying improvement in Forest Service access management, monitoring and enforcement, the impacts on fisheries, wildlife, secure habitat and solitude may prove disastrous.

Even where road closures exist and are functioning as designed, motorized administrative access often still occurs. The level of administrative use behind gates varies widely from Forest to Forest, ranging from a few motorized entries per gate per year to unrestricted administrative use. On many Forests, according to conversations with ranger districts in 1997, District Rangers dictate administrative

access, and motorized activity behind gates is not necessarily monitored. While administrative use likely does not pose a threat of similar scope or impact as the numbered points above, the public perception that the agency officials are exempt from use restrictions does little to win good favor or convince others that standards are ecologically based.

In an effort to address these broader points, Predator Project recommends that Congress, the US Forest Service, and the American people take the following steps to help remedy road-related problems:

CONGRESS:

- Pass legislation to protect remaining Federal roadless lands greater than 1000 acres;
- Remove purchaser road credits from the Forest Service's budgeting process and disburse funds to agencies for habitat restoration projects, road removal and obliteration, and scientific monitoring and analysis;
- Support efforts to reform agency timber management programs that remove incentives for commercial logging and road-building.

US FOREST SERVICE:

- Improve and make permanent the 18-month moratorium on road-building in roadless areas, announced in February 1999;
- Adopt a policy to build no new roads anywhere on national forest lands, which will shift many engineering and local jobs from road construction or timber harvest to road obliteration and habitat/watershed restoration;
- Improve maintenance and stream crossings for routes that remain an important part of the forest road system;
- Increase monitoring and enforcement of road and area closures.

Wild Rockies Field Institute photo

Local citizens and student groups can contribute by working with agency officials to close roads and restore damaged habitat.

AMERICAN PEOPLE:

- Participate in identifying and monitoring the status of road closures, ghost roads, and other road-related problems on our national forest lands, as well as surveying how motorized access is affecting the visitor's experience on our public lands;
- Use the information collected from field monitoring efforts to inform other citizens, agency decision-makers, and elected officials about the conditions of our public lands, and how these conditions affect fisheries, wildlife, and people;
- Express your support to agency decision-makers and elected officials at all levels for protecting wildlife and fisheries on our public lands and waters;
- Join Predator Project and other groups to participate in volunteer road obliteration and habitat restoration projects that can benefit habitat and humanity.

In truth, the underlying goal is simply to help people know enough and care enough about the effects of roads so that they will feel motivated to speak up and act. This gentle societal shift will be neither quick nor easy, but without it any road obliteration and habitat restoration efforts will serve as mere bandages in the midst of the massive bleeding that roads currently represent on our national forests.

With our help and concern and our actions, much of the damage that now exists due to roads may be healed. Many of the species that are currently pinned into dwindling habitat areas still have a chance to expand their range, increase their numbers, and inhabit lands that presently seem uninhabitable. If we learn enough, act purposefully enough, and respond wisely enough to the inevitable changes that await, one day the shriek of the red-tailed hawk may once again echo off a verdant canopy of fir, spruce or pine rather than the barren swath of a roadbed.

Wild Rockies Field Institute photo

Obliterating unnecessary roads can provide jobs to heavy equipment operators and restore some integrity to degraded landscapes.

Additional Resources

Road-Ripper's Handbook. The Road-Ripper's Handbook is a comprehensive resource for people interested in challenging roads or motorized recreation on public lands. It includes individual Road-Ripper's guides to: *The National Forests, The National Parks, The Bureau of Land Management, Off-Road Vehicles*, and *Wildland Road Removal*. The first four guides include specific analyses of the laws and regulations regarding roads or ORVs on different types of public lands. The fifth guide includes technical information about appropriate and inappropriate road removal. In addition to five guides, the handbook also includes a resource section with information about the ecological effects of roads, how to use the Freedom of Information Act, and a sampling of legal and literature reviews about roads and motorized recreation. $25. Available from Wildlands Center for Preventing Roads (see below).

The Ecological Effects of Roads, by Reed Noss. Reed Noss originally completed this 10 page literature review and summary of the direct and indirect effects of roads for Earth First!. It is now printed as part of the Road-Rippers handbook or separately. Free. Available from Wildlands Center for Preventing Roads.

A Bibliographic Database on the Ecological Effects of Roads. This database contains over 6,000 citations on the ecological effects of roads, and its development was coordinated by Reed Noss. It includes information on all aspects of the impacts of roads and is available in its entirety or through individual key word searches. Sliding Scale prices. Available from Wildlands Center for Preventing Roads.

A Bibliographic Database on the Ecological Effects of Motorized Recreation. Currently in formation, this database has over 1000 citations on the impacts of ORVs and other types of recreation. Available from Wildlands Center for Preventing Roads.

A Special Section on the Ecological Effects of Roads. The *Journal of Conservation Biology* will be printing a special section on the ecological effects of roads in the winter 1999 or spring 2000 issue. It will include 7-8 articles on the impacts of roads on different ecosystems and species. Available soon from *"Conservation Biology."*

Trails of Destruction. Trails of Destruction details the ecological impacts of off-road vehicles and explains the policies and financial incentives for increasing off-road vehicle use on public lands. It is an excellent overview of the entire issue of off-road vehicle use on US public wildlands. $10. Available from Wildlands Center for Preventing Roads or Friends of the Earth: 1025 Vermont Ave; Washington, DC 20005; (202)783-7400; www.foe.org.

Contact Wildlands Center for Preventing Roads for their bimonthly newsletter, as well as for more information about other organizations working on roads in your area: P.O. Box 7516, Missoula, MT 59807; (406) 543-9551; WildlandsCPR@wildrockies.org; www.wildrockies.org/WildCPR.

The Roads Scholar Project

Predator Project works to conserve and restore ecosystem integrity by protecting predators and their habitats — saving a place for America's predators. We advocate on behalf of more than 12 species that receive inadequate attention, seven of which are imperiled. We also work on behalf of several prey species, such as prairie dogs, because these animals provide predators with essential food and/or habitat.

Through our Roads Scholar Project, Predator Project works to reduce the negative impacts of roads and motorized access on wildlife and habitat security in our National Forests in the northern Rockies region. Specifically, we conduct our own field-based inventories to identify and quantify problems with uninventoried roads, ineffective road closures, excessive road miles, illegal motorized trails, and trail damage from off-road vehicles. We then use this information to work with citizen volunteers and the U.S. Forest Service to effectively close or obliterate inappropriate roads or motorized access trails.

Please consider supporting our efforts with a tax-deductible contribution, and/or by joining us in our field monitoring and habitat restoration projects in the northern Rockies region. Our field monitoring and habitat restoration projects include:

— our "Gatekeepers" program, whereby volunteers conduct their own on-the-ground monitoring of road closures based on an easily-followed system and protocol for collecting data (our "Gatekeepers" brochure). Predator Project uses this information to determine where the U.S. Forest Service needs to do a better job of closing or obliterating roads.

— our road closure/obliteration volunteer citizen "work parties," whereby volunteers and Predator Project staff, with direction from a National Forest, conduct the physical work needed to effectively close or obliterate an inappropriate road. This work can range from repairing a closure gate or blocking access around an otherwise effective gate, to literally loosening up the soil on a road, planting vegetation in and otherwise camouflaging the old road bed in order to restore the road to its original natural condition.

Between the U.S. Forest Service's recent commitment to reduce the number of roads on our national forests, and the agency's lack of adequate staff and funding to do so, both our "Gatekeepers" program and our road closure/obliteration "work parties" are a great way to help protect and restore our public wildlands habitat, while helping a federal agency meet its mandate to conserve and protect native species and their habitat.

For more information about the Roads Scholar Project or our other campaigns to save a place for America's predators, please contact us at: P.O. Box 6733, Bozeman, MT 59771; 406-587-3389; 406-587-3178 (fax); predproj@avicom.net; www.wildrockies.org/predproj.

You can join Predator Project for an annual membership of $20. For your membership, you will receive a year's subscription to our quarterly newsletter, timely action alerts, and other updates. Contributions are tax-deductible to the full extent of the law.

Roads Scholar Project photo

PREDATOR PROJECT

P.O. Box 6733
Bozeman, MT 59771
predproj@avicom.net
www.wildrockies.org/predproj