

# **Shattered Solitude/Eroded Habitat** **The Motorization of the Lands of** **Lewis and Clark**

**By Mark Lawler**

**Sierra Club**

**June 2000**





Dirtbike rider in Entiat Roadless Area, Wenatchee National Forest, Washington. Photo: Mark Lawler.

# Table of Contents

|  |    |
|--|----|
| Executive Summary.....   | 1  |
| The Problem.....   | 2  |
| What is an off-road vehicle?.....                                      | 5  |
| Where do ORVs go? .....  | 6  |
| Impacts on wildlife.....   | 6  |
| Impacts on aquatic systems.....  | 7  |
| Impacts on native plant communities.....                               | 7  |
| Impacts on air quality .....   | 8  |
| Impacts on trails.....   | 8  |
| Impacts on non-motorized backcountry users .....                       | 9  |
| A growing problem .....  | 9  |
| Perspective.....   | 10 |
| Regional summary .....   | 12 |
| State recreation participation .....                                   | 13 |
| Notes on state totals.....   | 15 |
| Motorization of Idaho’s National Forests .....                         | 16 |
| Motorization of Montana’s National Forests.....                        | 18 |
| Motorization of Oregon’s National Forests.....                         | 20 |
| Motorization of Washington’s National Forests .....                    | 22 |
| Motorization of Wyoming’s National Forests.....                        | 24 |
| Motorization of the Prairie States’ National Forests and Grasslands .. | 25 |
| Conclusions & Solutions .....  | 26 |
| Fairness needs to be restored.....                                     | 26 |
| A new opportunity.....   | 26 |
| Specific steps needed.....   | 26 |
| State and federal funding programs need overhaul.....                  | 27 |
| References .....   | 29 |
| Appendix.....  | 31 |
| Roads.....   | 31 |
| Trails.....  | 32 |
| Recreational visitor days.....   | 33 |
| Data references .....  | 34 |

Sierra Club Northwest/Alaska Office  
180 Nickerson Street, Suite 103  
Seattle, WA 98109  
206 378-0114

Sierra Club Northern Plains Office  
23 N. Scott, Room 27  
Sheridan, WY 82801  
307 672-0425

This work is part of the Sierra Club's campaign to promote, protect, and restore what remains of the wild America experienced nearly two hundred years ago by the Lewis and Clark expedition. To learn more about Sierra Club's celebration of the Lewis and Clark bicentennial, and to find this report in an electronic version, please visit the World Wide Web at [www.sierraclub.org](http://www.sierraclub.org).

Electronic copies of this report, including Excel spreadsheets of all raw data, are available on request by contacting the author at the Seattle address above, or by e-mail at [mark.lawler@sierraclub.org](mailto:mark.lawler@sierraclub.org).

Special thanks to Jennifer Ferenstein of Wildlands Center for Preventing Roads and Craig Engelking of Washington Trails Association for photographs and helpful insights. Thanks also to Christine Phillips, Larry Mehlhaff, Roger Singer, jonathan stoke, and Kirk Koepsel for their review and assistance.

## Executive Summary

Americans will soon be celebrating the bicentennial of one of the most exciting stories of our history: the Lewis and Clark expedition that first explored the western part of what is now the United States, on foot, by rowboat, and on horseback. The wild landscapes first glimpsed by the explorers remain only in scattered remnants across what is now an eight-state region. These states contain forty percent of the remaining pristine roadless areas of America's National Forests and National Grasslands. These roadless areas are some of the last places left that have not been logged, roaded, mined, drilled for oil and gas, or developed in some fashion.

A new threat to the integrity of roadless areas has recently emerged: dirtbikes (off-road motorcycles), all-terrain vehicles (ATVs), and snowmobiles. These vehicles create many impacts to wildlife and fish habitat, native plants, wetlands, watersheds, air quality, trails, and scenery. The expanding use of the machines compromises roadless areas' value as last refuges for endangered wildlife and harms the ability of hikers, horse riders, snowshoers, and cross-country skiers to enjoy the quiet backcountry.

In the National Forests and Grasslands of this eight-state region, dirtbikes, ATVs, and other motor vehicles have 135,000 miles of roads to ride on—a length that would stretch around the Earth more than five times. Another 26,000 miles of trails, mostly within roadless areas, are open to dirtbikes and ATVs. In comparison, there are only 35,800 miles of trails closed to motorized use where people can, at least briefly, escape the mechanized modern world. Yet hikers, backpackers, and horse riders make up 83 percent of the trail users on these National Forests and Grasslands. Half of these quiet non-motorized trails are outside of Wilderness areas and are not fully protected

from road construction, logging, and other development. Similarly, in wintertime there are 2.6 times as many cross-country skiers and snowshoers packed onto each mile of designated non-motorized trails compared to the number of snowmobiles per mile of designated snowmobile trail.

Idaho and Montana have the most heavily motorized trail systems of the region. The Boise National Forest, near Idaho's capital city, is the most heavily devoted to dirtbikes and ATVs, with 79 percent of its trails open to motors. In a given year 234 non-motorized trail users are packed onto each mile of trail on this forest, compared to only 68 motorized trail users per mile. Dirtbikes or ATVs are allowed on 71 percent of the trail mileage on the Gallatin National Forest near Bozeman, Montana, yet motor vehicle riders make up only 17 percent of trail users. Over 95 percent of the non-Wilderness trails on the Gallatin—a critical forest for recovery of wolves and grizzly bears—is open to motor vehicles. The popular Wenatchee National Forest, close to the Seattle/Puget Sound metropolitan area, allows dirtbikes or ATVs on 71 percent of its trail system outside Wilderness.

A recent proposal by President Clinton could protect these remaining wildlands from new road construction, logging, and other harmful development. To halt the environmental impacts posed by off-road vehicles, they should be eliminated from the remaining roadless areas. Construction and reconstruction of off-road vehicle trails should be halted within roadless areas. Federal and state funding programs should also be changed to halt further damage to roadless areas, to direct new motorized trail development into more appropriate areas, to restore trail and ecosystem damage from off-road vehicles, and to restore fairness in allocations of public dollars.

# The Problem

In 1804 Captains Meriwether Lewis and William Clark set out with their Corps of Discovery on a 29-month journey to explore the American West beyond the Mississippi River. These intrepid adventurers walked, rode on horseback, and rowed their way up and down rivers, just as local Native Americans had done for centuries.

The American West has been utterly transformed in the two centuries since first documented by Lewis and Clark. Most of our rural western landscape is now crisscrossed with roads, railways, powerlines, pipelines, dams, reservoirs, clearcuts, and other human developments. While these have brought Americans wealth, safety, and pleasure, we have lost many of the original sights, sounds, landscapes, and creatures from the era of Lewis and Clark. We continue to lose wildlands at a rapid pace: it is estimated that Washington state has lost an average of a quarter-million acres a year over the past century (Morrison et al. 1998), and Idaho lost a million acres of wildlands on National Forests in the ten years before 1995 (Anderson 1997). Once a wild area has roads built into it, its wild character is fundamentally and permanently changed. Even though forests and grasslands may regrow after logging and overgrazing, there can be permanent and irreversible changes in the original ecosystems present before human development.

Fortunately, some of those original wild places from the time of Lewis and Clark still remain. Most of the wildlands left in America are on federal public lands owned by all Americans. The largest share is on the National Forests and National Grasslands, lands designated with great foresight in the late 1800s and early 1900s to be protected forever in public ownership by all Americans. The National Forests and Grasslands are managed by the U.S. Forest Service, an agency within the U.S. Department of Agriculture. The federal Bureau of Land Management administers millions more acres of public lands, mostly sagebrush-steppe habitat, but those areas are not covered in this report.

Of the original wild legacy intended for protection by Congress and Presidents a century ago, comparatively little remains that is still pristine. Within the eight-state mountain and prairie region explored by Lewis and Clark (Table 1), the U.S. Forest Service has inventoried about 22 million acres as roadless areas that have no legislative protection—amounting to 40 percent of Forest Service-managed roadless acreage in the whole country, even though the eight states amount to only 20 percent of the area of the nation. About eight million additional acres of roadless lands exist that have not been inventoried by the Forest Service. (See Table 1.)

**Table 1. Land areas, millions of acres.**

| State             | All lands* | National Forests and National Grasslands, federal lands only |                                |                                   |                        |
|-------------------|------------|--|--------------------------------|-----------------------------------|------------------------|
|                   |            | Total acreage*   | FS Inventoried roadless areas* | Estimated actual roadless areas** | Designated Wilderness† |
| Idaho             | 53.49      | 20.46  | 9.23                           | 11.01                             | 3.97                   |
| Montana           | 94.11      | 16.89  | 5.83                           | 8.36                              | 3.37                   |
| Nebraska          | 49.52      | 0.35   | 0.10                           | 0.24                              | 0.01                   |
| North Dakota      | 45.25      | 1.11   | 0.27                           | 0.67                              | 0                      |
| Oregon            | 62.14      | 15.66  | 1.62                           | 2.78                              | 2.09                   |
| South Dakota      | 49.36      | 2.01   | 0.12                           | 0.80                              | 0.01                   |
| Washington        | 45.21      | 9.20   | 1.89                           | 3.00                              | 2.58                   |
| Wyoming           | 62.60      | 9.24   | 3.22                           | 3.76                              | 3.11                   |
| Eight-state total | 461.68     | 74.91  | 22.28                          | 30.63                             | 15.14                  |
| U.S. total        | 2,343.14   | 191.86   | 54.33                          | not available                     | 34.77                  |

\*USDA Forest Service 2000.

\*\*Unroaded areas with more than 5000 acres of federal land. Computed for Sierra Club by Pacific Biodiversity Institute from Geographic Information System data, 1999.

†Wilderness Information Network 2000.

Since 1964 Congress has declared significant areas as part of the National Wilderness Preservation System, protecting them from logging, road building, and motor vehicles. Yet Wilderness Areas amount to only three percent of the eight-state region. Another one percent has been protected as National Parks. However, much of the protected Wilderness and National Park acreage is high country that often has less of the low-elevation habitat that many species of wildlife and fish depend on. These protected areas are also becoming more isolated from each other, affecting the ability of wildlife to migrate naturally.

The remaining unprotected roadless country on the National Forests and Grasslands covers only 5 to 7 percent of the area of the eight-state Lewis and Clark region. Citizens of the region, plus visitors from the rest of the nation and world, rely heavily on that remaining small amount of wild landscape for much of their backcountry recreation.

A recreation experience in a roadless area could be:

- a guided horsepacking trip into the Badger-Two Medicine Roadless Area in Montana—not far from where Lewis, also on horseback, first encountered Blackfeet warriors
- a flyfishing vacation along the wild Lochsa River, just below the ridges where Lewis and Clark made a harrowing crossing of the Rockies
- an easy but spectacular dayhike, only a short drive from Portland, to the rim of the Columbia River Gorge overlooking where the Corps of Discovery sped seaward in their canoes; or
- an inspiring cross-country ski trip through wild areas in the tallgrass country of the Sheyenne National Grassland, in North Dakota not far from the Missouri River that guided Lewis and Clark west.

The value of these last remaining wild places is seen and felt every day by Americans using them for wildland recreation. As the nation continues to discuss and debate the future of our roadless areas, we should understand the types and quantities of recreation in the roadless areas that may be affected.

Before about 1960 a person using the backcountry of the National Forests would never encounter anyone but other hikers or horse riders. A new form of recreation has grown in these western public lands in recent decades: riding dirtbikes, all-terrain vehicles (ATVs), snowmobiles, and other off-road vehicles. While often used on roads, these machines can be driven deep into roadless areas and are now recognized as one of the most important threats to wildlife and fish that depend on the seclusion of roadless areas. The machines also tend to displace the non-motorized recreationists who would rather enjoy solitude, quiet, and the contemplative beauty of wild nature, and they can create physical damage to trails, soils, and plant communities.

U.S. Forest Service Chief Michael Dombeck has commented, “New and less expensive technology allows people to get to areas previously unreachable to motorized

vehicles...In the process, unplanned and unauthorized roads and trails may be created, sensitive wildlife habitat disrupted, erosion accelerated, and water quality degraded.” (Dombeck 1999.) Numerous impacts from ORVs, along with information on how public agencies have facilitated increased ORV use, have been detailed in a report by Friends of the Earth (1998).

The number of Americans driving off-road increased about 44 percent between the early 1980s and mid-1990s (see Figure 1). Yet during the same period the number of hikers increased 94 percent. Of course, National Forests or Grasslands were a destination for only a small fraction of these recreationists; the numbers shown in Figure 1 include visits to all lands, public and private. The following chapter provides more specific recreation use information on 44 western National Forests and Grasslands, where non-motorized use of the backcountry predominates.

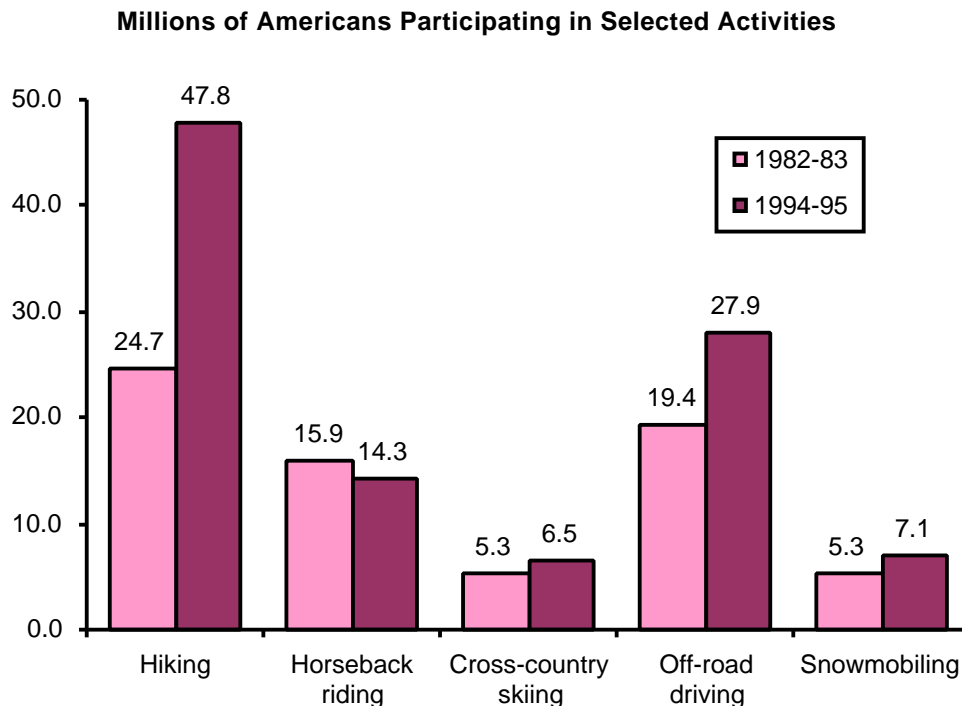


Figure 1. Trends in numbers of Americans over age 16 who participate in selected activities at least once a year. From Cordell et al., 1999.



Beyond recreation, the remaining undeveloped places on the National Forests and Grasslands are also crucial refuges for rare fish and wildlife. Rivers and streams in roadless areas provide the highest water quality and provide stability to watersheds that benefits increasingly endangered native fish species such as trout, salmon, and steelhead. Similarly, many wildlife species that need seclusion and undisturbed forests and grasslands, including gray wolves, grizzly bears, and lynx, find their best habitat within roadless areas.

This report explores the rapidly expanding use of off-road vehicles on these public lands, the mileage of trails and roads available to them, the relative numbers of motorized off-road travelers compared to nonmotorized travelers, and possible solutions to the problems.

### What is an off-road vehicle?

The most common kinds of motor vehicles ridden for pleasure on the National Forest System are:

- motorcycle or dirtbike (frontispiece and Figure 2)
- all-terrain vehicle (ATV), a three- or four-wheel vehicle with oversize tires (Figure 3)

- high-clearance four-wheel drive vehicle (4WD or 4x4), such as a jeep, some pickup trucks, and more rugged sport utility vehicles
- snowmobile (Figure 4)

Improvements in the suspensions and engines of motorcycles and ATVs have made them increasingly capable of driving into rugged backcountry areas. Many snowmobile models have much more powerful engines than in years past, enabling them to punch up very steep slopes through deep snow and rapidly access remote backcountry.

Figure 2. Off-road motorcycle (dirtbike). Photo: Southern Rockies Ecosystem Project.

Additional types of vehicle are becoming available, such as electrically powered fat-tire bicycles, six-wheel-drive machines capable of scaling 45-degree slopes, and tracked ATVs designed to travel on snow, mud, and water.

This report will focus on motorcycles, ATVs, and snowmobiles, which typically constitute the large majority of motorized users of trails and roadless areas on the region's National Forests and Grasslands.

### Where do ORVs go?

In most forested country, these vehicles usually need some type of trail or road to be driven on, although fat-tired ATVs can push through low brush to create their own paths. In more open grassland and sagebrush-steppe country, they can go cross-country, off of the roads and trails, if the ground is not overly steep. Sometimes ATVs push up hiking and horsepacking trails, turning once narrow, winding trails into two-track ATV routes.

However, since most "off-road" vehicles on National Forests and Grasslands in the eight-state region do in fact use trails or roads, it is appropriate to look at the number of miles of trails and roads open to different motorized uses in order to compare with non-motorized uses. This comparison will be made in the next chapter.

Many National Forests have “upgraded” trail systems to make them suitable for off-road vehicles. A great many of these trails access pristine backcountry. State monies have in many cases supplemented federal funds to convert trails to vehicle use. The result is that on most of the region’s National Forests, dirtbikes and ATVs can now ride long distances on trails to access quite remote wild areas that used to be long hiking or horse riding destinations.

### **Impacts on wildlife**

With wildlife and fish habitat severely compromised across much of the West by roads, logging, and development, the remaining undeveloped lands are a last safe refuge for our native wildlife and fish species. However, humans access much of that remaining backcountry—by foot, by horse, or with ORVs. All such human access has the potential to create impacts on wildlife, particularly species such as elk, wolf, and grizzly bear that need seclusion to reproduce and flourish.

Wildlife can be chased away from natural food sources, disturbed during sensitive times when they are bearing young, and habitat components such as wetlands and meadows can be damaged by trampling and introduction of exotic invasive weeds. The top cause of mortality in grizzly bears is contact with humans; where humans sense a threat, the bears typically lose. Grizzly bear deaths are five times as likely in roaded areas as in unroaded areas. (Mattson and Knight 1991.) Wolves have similar habitat needs, and are also highly sensitive to encroachments of humans via roads and trails (Sachet 1988).

By their nature snowmobiles compact snow on their trails. Many snowmobile trails are compacted and smoothed by grooming

machinery. This compaction makes it easier for wildlife to move in otherwise deep, soft snow. Some wildlife has evolved to survive in conditions of deep, soft snow, such as lynx, which has broad furred snowshoe paws. The compacted snowmobile paths may allow lynx competitors like coyotes and cougars to access lynx habitat they could not otherwise reach. The migration patterns of elk, bison, and other ungulates can be altered when they encounter these routes that make their walking easier.

Based on both legal requirements and biological concerns, the courts are increasingly agreeing that impacts to wildlife should be assessed before the Forest Service constructs ORV trails in wild areas. In a recent case in Washington, the Wenatchee National Forest Supervisor wanted to expand an ORV trail system in an inventoried roadless area and a Late-Successional Reserve (LSR) designated for protection in the Pacific Northwest Forest Plan. A federal court ruled that (among other things), “The impact of ORV use upon wildlife, and upon LSR objectives, in this trail system was a question that needed to be asked and answered to satisfy the requirements of [the National Environmental Policy Act.]” (Rothstein 1999.)

### **Impacts on aquatic systems**

Fish habitat is highly sensitive to sedimentation. Just as a road can introduce sediment into streams, so can trails, particularly those that are poorly maintained, over-used, or located improperly. ORV crossings of streams can cause the collapse of streambanks, resulting in loss of riparian vegetation and entry of large amounts of sediment into the stream (Brown 1994). Four-wheel-drive vehicles often drive up and down streambeds. User-built trails usually have no features for proper drainage and erosion control. Small headwater streams suffer the most damage.

Wetlands are highly prone to damage from off-road vehicles. Compaction of soils by vehicle tires leads to loss of vegetation and can cause later erosion of exposed soil. Compaction and soil displacement are worst when soils are wet. Many Forest Service system trails wind through wetlands; when use is light, there may be little

Figure 3. All-terrain vehicle (ATV). Photo: Mark Aronson/Wildlands-CPR.

compaction or erosion, but when more and more motor vehicles use the trail, impacts can become severe. Erosion running down compacted trails can wear away the tread surface, developing a deep rut. Ruts can become several feet deep, in some cases making the trails impassable. Later vehicles then ride around the ruts, creating new sets of ruts.

### Impacts on native plant communities

Exotic species of knapweed, hawkweed, daisy, leafy spurge, thistle, and many other invasive plants are taking over vast areas of the West, displacing native vegetation, altering the makeup of native plant communities, and harming wildlife that depend on native plants. Cheatgrass and leafy spurge become flammable and promote more frequent wildfire. Rare and endangered native plant species are particularly at risk to be displaced or out-competed by these exotics. (BLM and Forest Service 1999, p. 74; Tyser and Key 1988; Tyser 1992.) Roads and trails are the primary vectors for the spread of the many weed species that thrive in disturbed sites along roads and trails. Roadless areas have been less prone to weed invasions because of the lack of roads and development. However, the tires of ORVs can pick up weed seeds and drop them along the trails, helped by the disturbance from their tires. Roadless areas are becoming ever more invaded by weeds with the increased use of ORVs.





Figure 4. Snowmobiles. Photo: NPS.

### **Impacts on air quality**

Most dirtbikes, snowmobiles, and ATVs use two-cycle gasoline engines, similar to lawnmower engines, that burn engine oil along with the fuel. They create particularly high levels of pollution per mile ridden. Air quality measured along snowmobile routes in Yellowstone National Park frequently exceeds federal air pollution standards. (E.g. National Park Service 1999, 2000.) While manufacturers have promised to clean up their machines, it has not happened to any great extent. Two-cycle engines are also loud, and many models lack good sound suppression. As the machines age, owners' maintenance of mufflers can be lax. The result is that many ORVs, particularly dirtbikes and snowmobiles, are quite loud and can be heard from miles away.

### **Impacts on trail s**

When motorized users access a remote area on a road or trail, it then becomes easier for them to create their own new roads or trails to access yet more backcountry. Open areas such as alpine meadows and grasslands are particularly vulnerable to damage from machines diverting from designated routes and riding cross-country. A new vehicle track can be created simply by repeated use of the same route. Frequently riders will cut trail switchbacks that are too tight for machines, creating steep new erosion paths.

Users sometimes actually build their own roads and vehicle trails by cutting trees and roots and moving earth and rocks. The problem of illegal

user-built roads and trails is acute on some National Forests, with inadequate Forest Service staff to monitor the land and take preventative action. The agency is often unaware of these illegal incursions into wildlife habitat. Preventing motor vehicle use of certain roads and trails, and preventing motorized use of roadless areas entirely, is the best way to prevent new access routes from being created in the first place.

ORVs tend to widen the trail tread, loosen rocks and soils to create a slipperier trail surface, grind soils into fine dust particles, kick up the dust when they ride by (see frontispiece), and promote mudholes on the trails, making pedestrian and horse use more difficult, less safe, and far less enjoyable. Dirt bikes often create V-shaped trenches in soft soils and on trail switchbacks—too narrow for a hiker to walk in, but too wide to straddle. The cumulative physical damage from ORVs can make some trails virtually impassable to pedestrians and horse riders. In most of the region's National Forests, many originally well-designed, well-graded, and pleasant hiking trails have become unsightly and unpleasant wrecks only suited for speeding vehicles. While special trail structures such as concrete blocks set into the ground can reduce such erosion, they are expensive, unsightly, ungainly to walk on, and detract from the backcountry experience (Figure 5).



Figure 5. Concrete blocks, installed in a trail to reduce erosion from dirtbikes, make for awkward footing for pedestrians. This installation on public land was funded out of Washington State gasoline taxes. Photo: Washington Interagency Committee for Outdoor Recreation.

## Impacts on non-motorized backcountry users

The smell, sight, and sound of motor vehicles detract from many non-motorized users' enjoyment of the backcountry. After sweating for hours to reach a remote destination on foot, on cross-country skis, or on snowshoes, it is discouraging to then encounter motor vehicles on the trails, to hear or see them in the distance, or to view eroded landscapes caused by ORV use. Non-motorized trail users may also perceive that motor vehicles on the trails are a safety hazard. Non-motorized recreationists often use roadless areas and trails to escape signs of mechanized life for a time, to breathe fresh air, and to have the chance to see wildlife. Encountering machines harms that experience. As a result, many non-motorized users simply avoid ORV trails and go elsewhere, such as designated Wilderness. This exacerbates crowding on heavily-used non-motorized trails and puts more pressure on over-used Wilderness areas.

Most National Forests and Grasslands are open to off-road vehicle travel unless specifically closed through a closure order signed by the local managing official. This "open unless closed" policy has allowed vehicles to create random tracks across open meadows, drive up creekbeds, cross eroding streambanks, and otherwise create major damage to ecosystems and recreational resources. The problem has become sufficiently severe that the Northern Region of the Forest Service and the BLM have proposed restricting cross-country vehicle travel on public lands in Montana, North Dakota, and a portion of South Dakota (BLM and Forest Service 1999).

A dirtbike rider can easily go 50-100 miles in a day, depending on trail conditions and the rider's capabilities. A hiker might average 6-10 miles in a day, perhaps 15 miles if in top condition. A single dirtbiker, therefore, may use a far larger area of public land than a single hiker or backpacker, creating impacts to wildlife, fish, water quality, air quality, and other users across quite a large area. The same discrepancy in distance covered and land needed occurs when comparing snowmobiles to cross-country skiers and snowshoers. Indeed, in open country snowmobiles can race at over 60 miles per hour, covering huge areas.

## A growing problem

These numerous problems are likely to grow worse with the continued rapid growth in the number of ORVs. The annual sales of new ATV's, motocross bikes and Enduros (types of off-road motorcycles) doubled in Montana and North and South Dakota between 1990 and 1998 (BLM and Forest Service 1999, p. 59). In Montana, the number of ATVs and motorcycles used off-highway increased 156 percent over the same interval. By the year 2015 this number is expected to be 91 percent higher again than in 1998. (Ibid, p. 63.) If no changes are made in National Forest management, impacts from vehicles on federal lands will accelerate.

# Perspective

Three key measures can help gauge the relative amounts of recreation on these National Forests and Grasslands: trail mileages, road mileages, and numbers of recreational users, all available from the U.S. Forest Service down to the individual National Forest unit. Additional coarse state-wide survey data are available from state agencies that write State Comprehensive Recreation Outdoor Recreation Plans (SCORPs).

For this report, the miles of “system trails” (inventoried and maintained trails) on each National Forest and Grassland were obtained from Forest Service offices at the regional, forest, and in some cases local ranger district level. Data included the miles open or closed to different motorized uses, and miles within established Wilderness. Miles of winter trails for snowmobiles and cross country skiing/snowshoeing were also obtained. Similarly, the Forest Service provided miles of roads open to the public on each National Forest, including the miles requiring high-clearance vehicles and the miles drivable by regular low-clearance passenger cars. While the agency also keeps an inventory of roads closed to public use, these don’t contribute much to public recreation and have not been included here.

Until 1997 the Forest Service estimated numbers of recreational users according to standard classifications called RIM (Recreation Information Management) Activity Codes. Six such codes were used for this report:

- hiking and walking (RIM code 14.1)
- horseback riding (14.3)
- cross country skiing and snowshoeing (51.5)
- motorcycle (11.2)
- snowmobile (11.3)
- ATV (11.4).

While some bicycles use trails, in most areas the numbers are relatively low compared to the other trail users, and the Forest Service statistics do not distinguish between bicycle use of trails vs. roads, so bicycles have not been considered in this analysis.

Through 1996 or 1997 the agency estimated the annual numbers of visitors participating in such activities in terms of Recreational Visitor Days (RVDs). An RVD is “an entry of one person upon a National Forest site or area of land and water to participate in one or more recreation activities” for a single day. RVDs are not precise absolute figures, and their accuracy is sometimes doubtful, but they can still be useful for comparing different types of recreation on the same forest. More recently, the Forest Service has moved toward a more statistically based survey method, but it may not yield the same level of detailed RVD breakdowns as available in the older system.

Table 2 shows the eight states for which trail, road, and recreational use data were compiled, along with the units of National Forests and National Grasslands within each state. The few units that overlap more than one state are indicated.

**Table 2. National Forests and Grasslands Studied.** Small overlaps with other states shown in parentheses.

|              |  |
|--------------|--|
| Idaho        | Boise, Salmon-Challis, Clearwater, Idaho Panhandle (+WA), Nez Perce, Payette, Sawtooth, Targhee (+WY), Caribou   |
| Montana      | Beaverhead-Deerlodge, Bitterroot, Custer (+SD), Flathead, Gallatin, Helena, Kootenai, Lewis and Clark, Lolo  |
| Nebraska     | Nebraska NF (including Oglala NG and Samuel R. McKelvie NF) (+Buffalo Gap NG and Ft. Pierre NG in SD)  |
| North Dakota | Dakota Prairie NG (+SD)  |
| Oregon       | Deschutes, Fremont, Malheur, Mt. Hood, Ochoco, Rogue River (+CA), Siskiyou (+CA), Siuslaw, Umatilla, Umpqua, Wallowa-Whitman (+ID), Willamette, Winema |
| South Dakota | Black Hills (+WY), Buffalo Gap NG**, Ft. Pierre NG**, Grand River NG (†)   |
| Washington   | Colville, Gifford Pinchot, Mt. Baker-Snoqualmie, Okanogan, Olympic, Wenatchee  |
| Wyoming*     | Bighorn, Bridger-Teton, Medicine Bow, Shoshone   |

\*Wyoming data in this report do not reflect the small Wyoming portions of the Ashley and Wasatch-Cache NFs, which lie mostly in Utah.

\*\*Administered by Nebraska NF

†Administered by Dakota Prairie NG

## Regional summary

In these eight states, the National Forests and Grasslands contain:

- 135,000 miles of roads open to public recreational use.
- 35,800 miles of summer trails closed to motorized use (of this, 17,400 miles are in designated Wilderness)
- 26,000 miles of summer trails open to motorized use
- 2,400 miles of cross-country ski trails
- 13,800 miles of snowmobile trails

The number of users of ORVs is far less than the number of pedestrians and horse riders. In millions of recreational visitor days (RVDs):

- 5.6 hiking and walking
- 1.6 horseback riding
- 0.9 motorcycle
- 0.6 ATV
- 0.9 cross-country skiing and snowshoeing
- 1.9 snowmobile

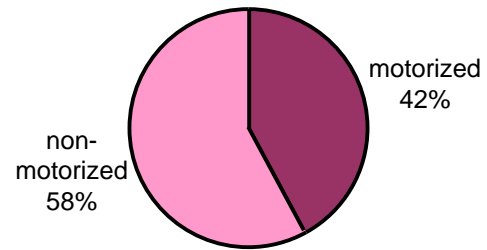
Thus a vast array of roads, trails, and winter routes is presently open and available to motorized recreation. The proportion of trails available for quiet backcountry recreation is much smaller than the proportion of hikers, horse riders, cross-country skiers, and snowshoers.

Across the eight states, there are an average of 201 non-motorized users per mile of trail closed to motors, compared to only 46 motorized users per mile of trail open to motors. Of course, some pedestrians and horse riders do travel on motorized trails, and some will go off-trail, but overall they find a more limited and crowded resource when they seek non-motorized trails.

The 42% of all National Forest trails in the region open to motorized use is shown in Figure 6, compared to the only 14% of trail users on motor vehicles.

Similarly, an average of 359 skiers and snowshoers are on each mile of designated non-motorized winter trail, compared to 136

a. Trail miles



b. Trail users

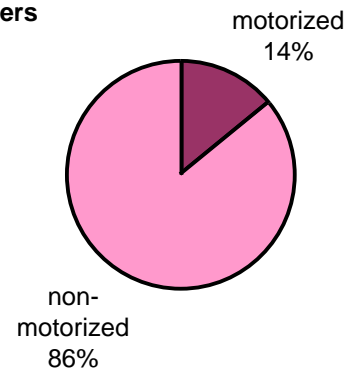


Figure 6. The fraction of trails in the region's National Forests and Grasslands open to motorized use is much greater than the fraction of trail users who ride motor vehicles. a. Fraction of the eight-state region's trail mileage open to motor vehicles. b. Fraction of the region's trail users who use motor vehicles on trails.

snowmobile riders per mile of designated snowmobile trail. While snowmobilers and skiers often depart from designated winter routes, these numbers do indicate major differences in facilities available to the different recreationists in winter.

All trail, road, and user information is shown for each state, and for each National Forest or Grassland unit in that state, in the following figures and tables. The patterns in each state are generally similar to the region as a whole, with Idaho and Montana having the most heavily motorized trail systems. The states with the highest proportion of non-motorized trail users are Oregon, Washington, and Nebraska.

## State recreation participation

All states produce occasional reports on recreational uses to guide funding for federal and state agencies. These results for trail-type users are shown for the past decade in Figure 7. These overall user proportions are similar to the trail user proportions on National Forest lands. However, the totals provided by state reports are the numbers of households engaged in the activity at least once a year, whereas the Forest Service RVD figures are numbers of days any users have visited the National Forests. A household obviously may have more than one member participating in the listed activities. These state figures also represent recreation on all lands, not just National Forest units. The state household numbers therefore tend to be larger than the respective National Forest visitation numbers for the same type of recreation.

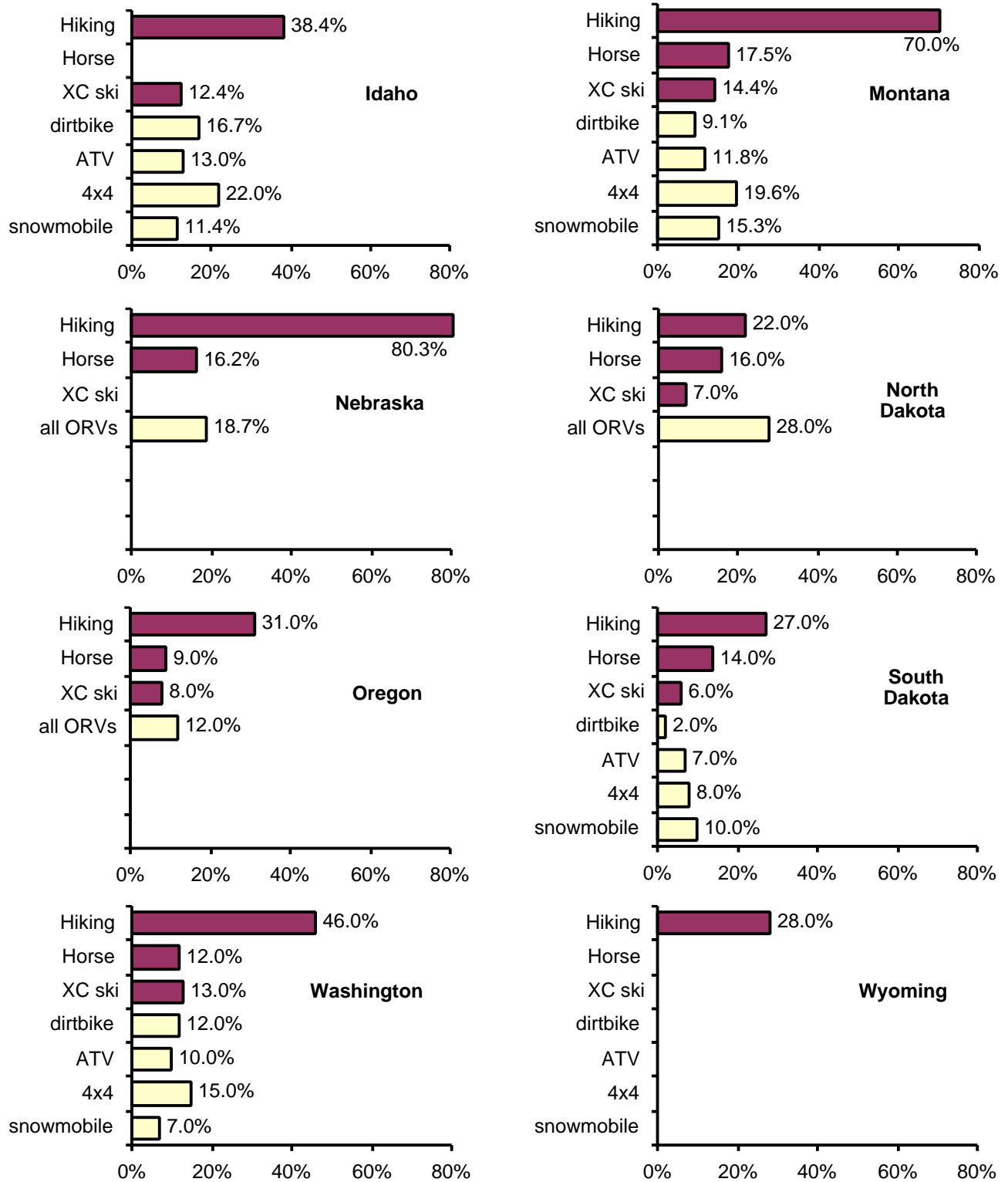


Figure 7. Number of households in each state participating in selected forms of recreation at least once a year. Not all states collect data in the same way; if a bar is missing, there are no data for that category. Three states lump all off-road vehicle users into a single category. (Mahoney et al. 1995, McCool and Harris 1994, State of Idaho 1993, State of Nebraska 1994, State of North Dakota 1996, State of Oregon 1994, State of South Dakota 1993, State of Washington 1991.)

## Notes on state totals

Forest Service statistics are available for each individual National Forest or Grassland unit. Several National Forest and Grassland units cover more than one state, so in those cases it can be difficult to segregate trail and road mileage and user statistics by state. However, most such overlaps are minor. The state-level summaries shown in this report have been created using only the Forest or Grassland units that are predominantly in the respective state. For example, the largest part of the Targhee National Forest is in Idaho, with a smaller portion in Wyoming; the Targhee is therefore included only in Idaho state totals in this report.

The situation is a bit more complex for the Plains states. Numerous individual Forest and Grassland complexes have been administratively lumped into three units, each with a Forest Supervisor: the Dakota Prairie Grassland, which includes all Grasslands in North Dakota plus the Grand River National Grassland in South Dakota; the Nebraska National Forest, which includes units in Nebraska and the Buffalo Gap and Fort Pierre National Grasslands in South Dakota; and the Black Hills National Forest, mostly in South Dakota. Fortunately, data are available to allow these units to be subdivided between North Dakota, South Dakota, and Nebraska.

All data are broken down by individual National Forests and Grasslands in the Appendix. State “total” values shown are the measure computed by adding the contributions from all National Forest System units. For example, the “ID Total” shown in the bar graph for Users Per Mile of Trail is the sum of all users in the state’s National Forests divided by the sum of all trail miles in the state’s National Forests.

The Siuslaw National Forest in Oregon has been excluded from the totals, because its data show very large numbers of both pedestrian and ORV use on a very small trail base—due to most of the use being on ocean beaches and

dunes. Trail miles on the Siuslaw still contribute to the totals. The Willamette National Forest contributes an anomalously high two-thirds of all hiker RVDs and half of all cross-country skier RVDs for the state of Oregon. This highlights the fact that RVDs may be estimated differently on different National Forest units. While statewide totals are helpful to a general understanding of visitor use, it is probably safer to compare user statistics only within a given National Forest unit, as shown in the following figures.

## Motorization of Idaho's National Forests

Summertime recreation in the National Forest System of Idaho has become dominated by dirtbikes and all-terrain vehicles (ATVs) on 11,677 miles of motorized trails, plus driving on 24,970 miles of roads.

Hikers, backpackers, and horse riders seeking quiet nature have a diminishing resource of trails closed to motors—8,486 miles. About half of this network, 3,961 miles, is outside of designated Wilderness. Statewide, on-road and off-road vehicle riders have 4.3 times as many miles of roads and motorized trails as do muscle-powered users seeking trails closed to motorized use.

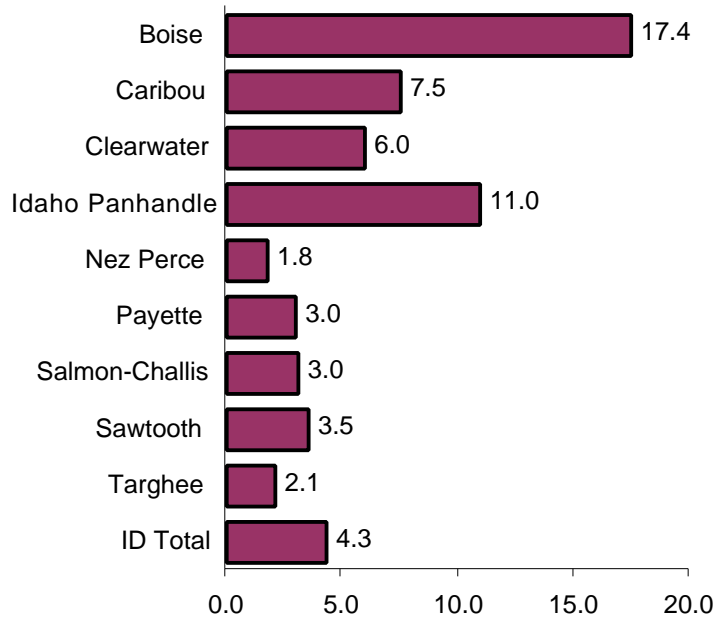
The Boise National Forest, despite being closest to the state's largest population center, is the most heavily motorized forest, with over seventeen times the mileage of roads and motorized trails as miles of non-motorized trails.

Summer trail users seeking non-motorized places are seeing more crowded conditions, with an annual average of 112 non-motorized users per mile of non-motorized trail on all Idaho National Forests, compared to 36 motorized users per mile of motorized trail.

On the Boise National Forest, 234 non-motorized users are packed annually onto each mile of non-motorized trail, with less than a third this number of motorized users per mile of motorized trail.

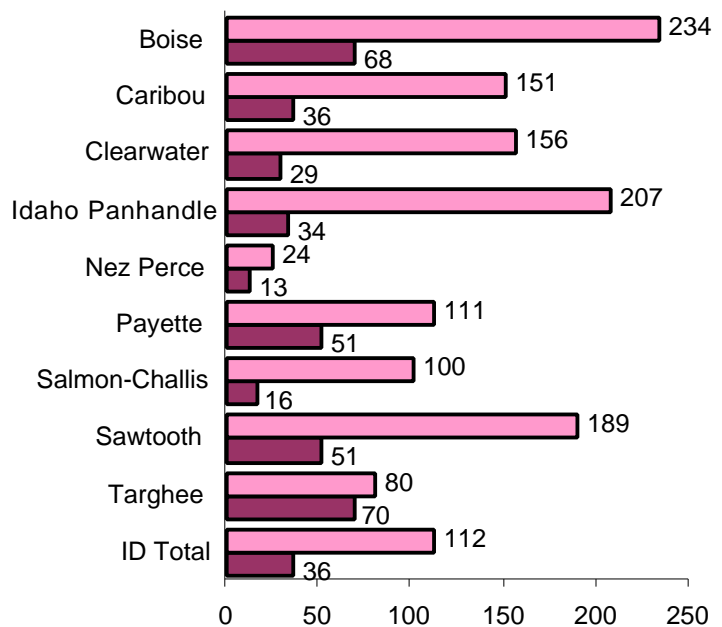
### Ratio of motorized vs. non-motorized access routes

(miles of roads + motorized trails)/  
miles of non-motorized trails



### Users Per Mile of Trail

Non-motorized users/mile of non-motorized trail ■  
Motorized users/mile of motorized trail ■



Nearly 58 percent of the summer trail system is open to dirtbikes and ATVs in Idaho's National Forests, yet only 30 percent of the trail users ride dirtbikes or ATVs.

The discrepancy between miles of motorized trails and numbers of motorized trail users is particularly great on the Salmon-Challis National Forest, where 54 percent of the trail miles are open to the only 16 percent of trail users who are motorized.

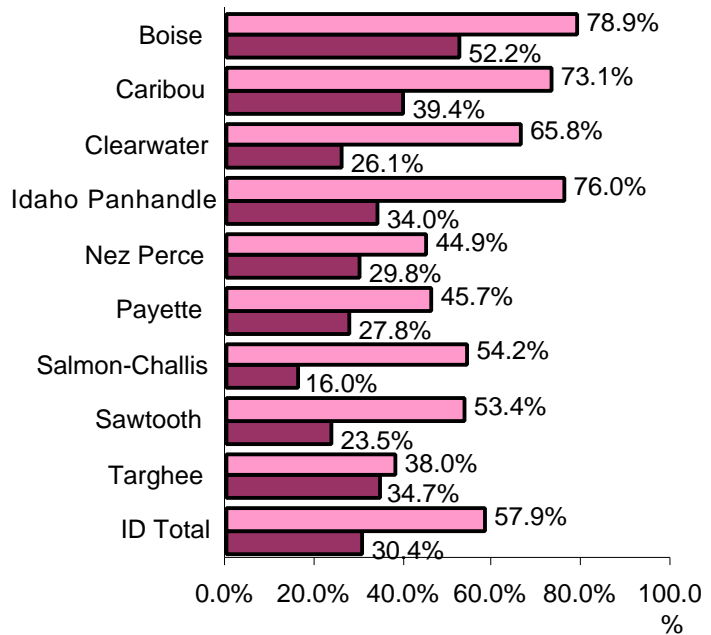
The Boise National Forest has the highest percentage of motorized trail miles, with nearly 79 percent. The Idaho Panhandle National Forest, close to the large metropolitan Spokane-Coeur d'Alene area, is next at 76 percent.

Winter trail statistics paint a similar picture. About 92 percent of the winter trails on Idaho's National Forests are dedicated to snowmobile use. The result is that, statewide, 499 cross-country skiers and snowshoers are packed onto each mile of dedicated non-motorized winter trail. Yet there are only 148 snowmobile riders on each mile of snowmobile trail. These figures do not reflect off-trail and off-road winter use.

(All data shown here are derived from 1993-99 Forest Service and Idaho State trails and recreation information. Data include portions of the Idaho Panhandle National Forest in Washington and Targhee National Forest in Wyoming, and Sawtooth National Forest in Utah.)

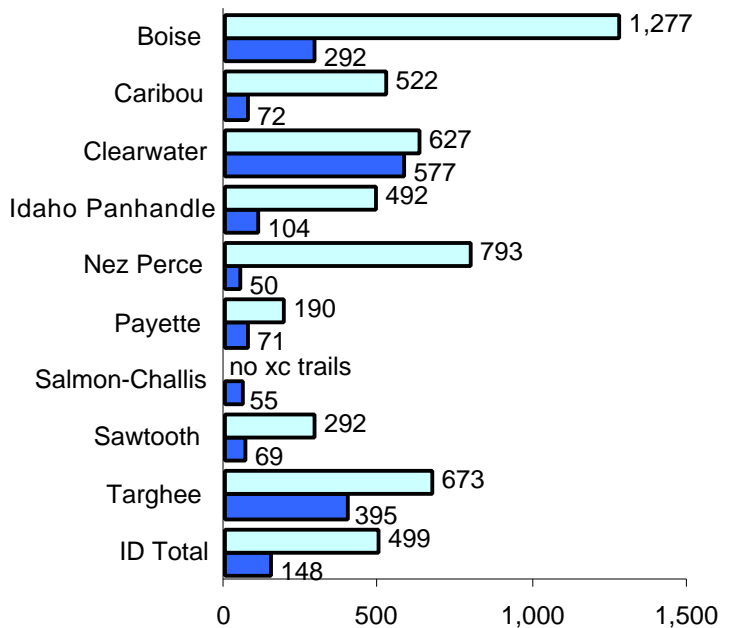
### Fraction of trails & users that are motorized

Percentage of trail miles open to motor vehicle ■  
 Percentage of trail users riding motor vehicles ■



### Winter Users Per Mile of Trail

(XC skiers+snowshoers)/mile of non-motorized trail ■  
 Snowmobile users/mile of motorized trail ■



## Motorization of Montana's National Forests

In Montana's National Forests, 10,595 miles of trails are open to dirtbikes and ATVs. Another 24,257 miles of roads are open to motorized recreation. This combined total is 4.3 times the 8,055 miles of trail that are closed to motorized use. About half of these quiet trails dedicated for hiking, backpacking, and horse riding, 3,985 miles, are outside of designated Wilderness.

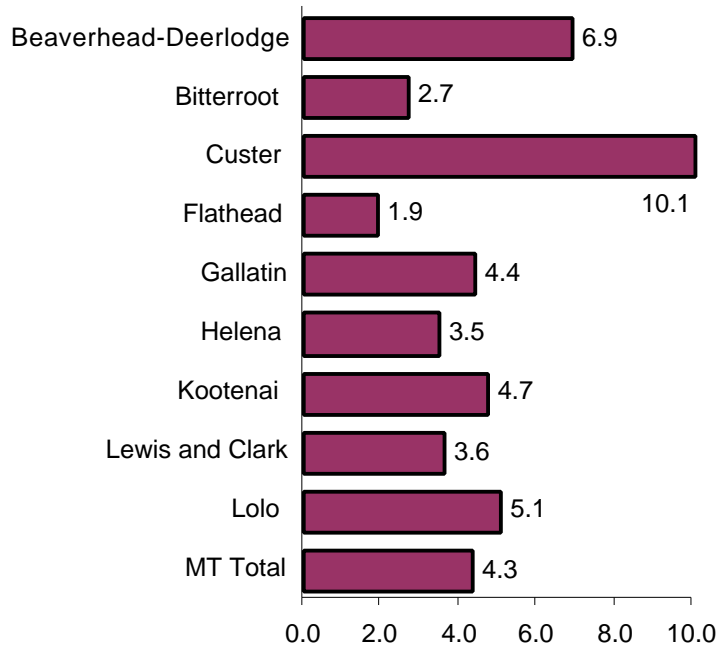
An average of 30 users of dirtbikes and ATVs ride each mile of motorized trail in a year, compared to 156 hikers and horse riders per mile of non-motorized trail.

Statewide only 20.4 percent of trail-based National Forest users ride dirtbikes or ATVs, even though they have access to 56.8% of the trail mileage.

The Custer National Forest has the greatest proportion of roads and motorized trails compared to non-motorized trails, at a ratio of 10.1, with the Beaverhead-Deerlodge, near Butte, next with a ratio of 6.9. The Beaverhead-Deerlodge and Lolo National Forests have the greatest road network, at 4,678 and 3,995 miles, respectively. The Gallatin National Forest near Bozeman has the most heavily motorized trail system, with 71 percent of the trail mileage open to motor vehicles.

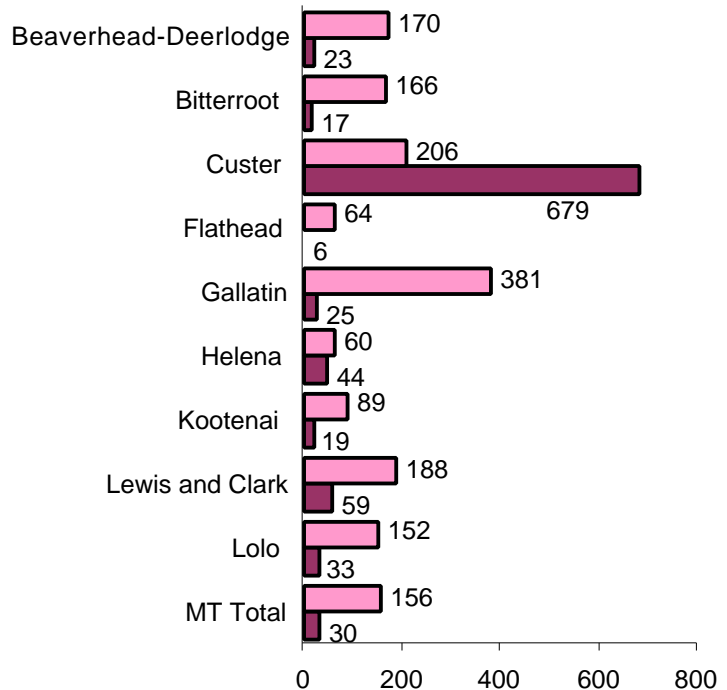
### Ratio of motorized vs. non-motorized access routes

(miles of roads + motorized trails)/  
miles of non-motorized trails



### Users Per Mile of Trail

Non-motorized users/mile of non-motorized trail  
Motorized users/mile of motorized trail



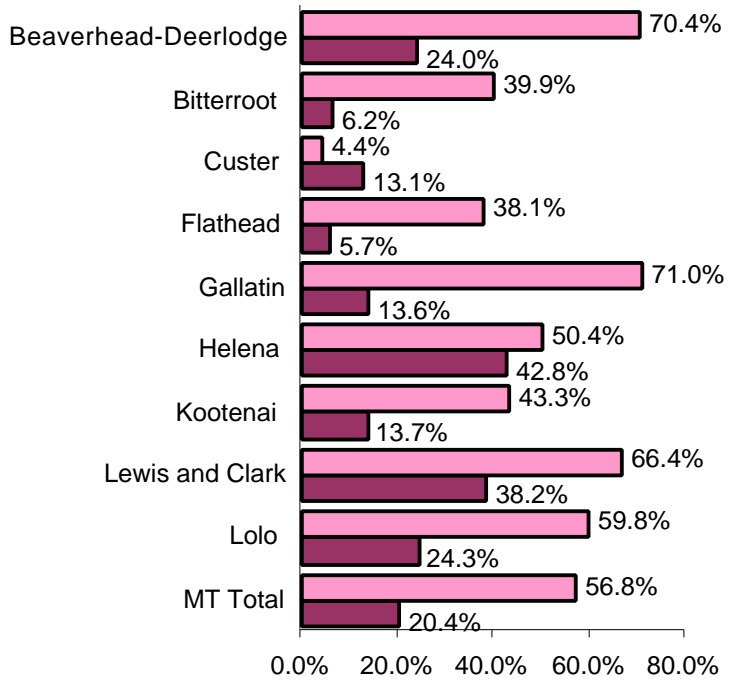
The discrepancy between trails open to motors vs. number of motorized users is particularly stark on the Bitterroot National Forest near Missoula, where nearly 40 percent of the trails are open to motorized use, yet only 6.2 percent of users are motorized. This results in only 17 motorized users per mile of motorized trail in a given year, but there are 166 non-motorized users on each mile of non-motorized trail. The latter numbers statewide are 30 vs. 156.

Similarly, on most National Forests more cross-country skiers and snowshoers are packed onto dedicated non-motorized winter trails than the number of snowmobilers per mile of dedicated snowmobile trail.

Statewide these numbers are 508 cross-country skiers and snowshoers per mile of nonmotorized trail, vs. 263 snowmobilers per mile of snowmobile trail. The Helena and Bitterroot National Forests show the greatest discrepancies, with their winter trail systems heavily skewed toward snowmobile use.

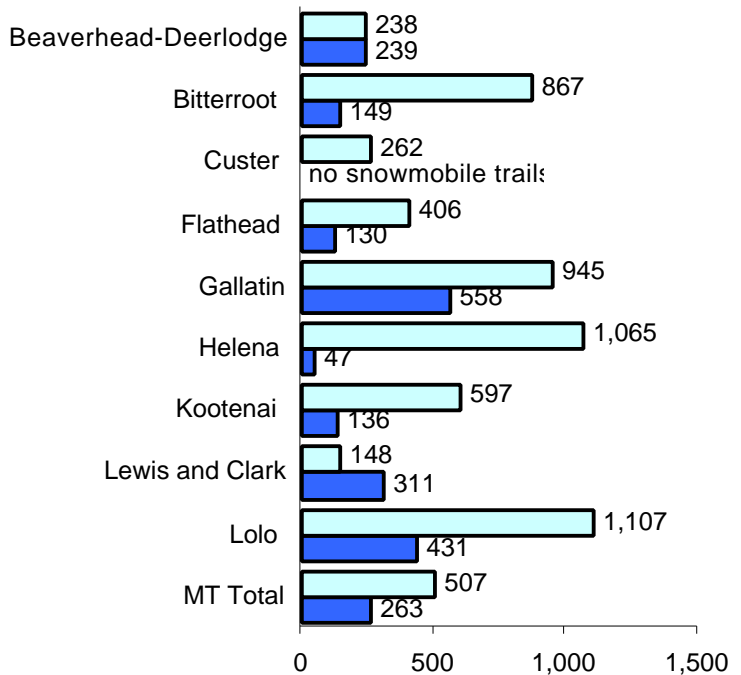
### Fraction of trails & users that are motorized

Percentage of trail miles open to motor vehicle ■  
 Percentage of trail users riding motor vehicles ■



### Winter Users Per Mile of Trail

(XC skiers+snowshoers)/mile of non-motorized tr. ■  
 Snowmobile users/mile of motorized trail ■



## Motorization of Oregon's National Forests

In Oregon's National Forests, an incredible 53,916 miles of roads are open for public use, including dirtbikes and ATVs. About 1,178 miles of trails are open to motor vehicles. This combined total is 6.9 times the 7,934 miles of non-motorized trails dedicated to quiet recreation by hikers, backpackers, and horse riders. A majority—4,655 miles—of the non-motorized trails are outside of established Wilderness areas.

The Winema National Forest has the least trail mileage of any National Forest in the state, yet it still has a substantial road network. The forest has an amazing 32 miles of motorized riding opportunities for every mile of trail closed to motors.

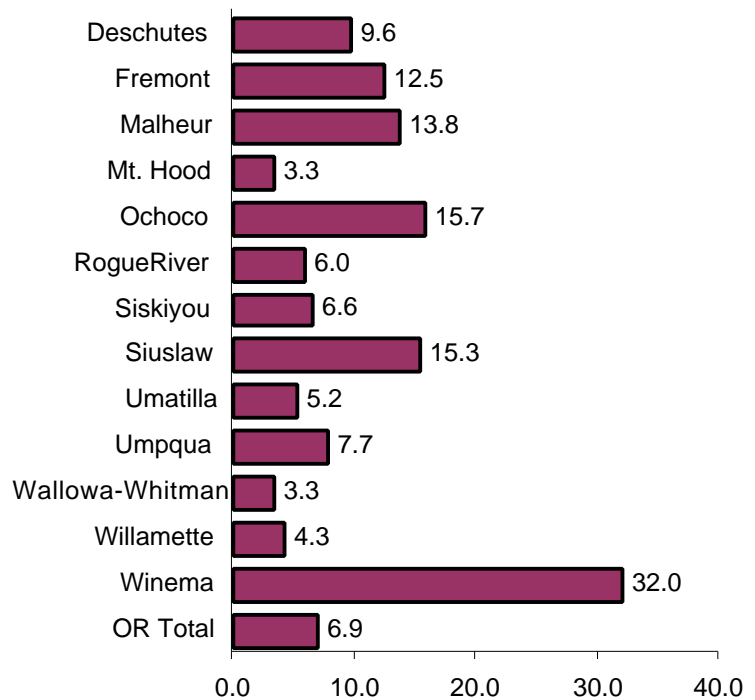
An average of 98 users of dirtbikes and ATVs ride each mile of motorized trail in a year, yet in a given year there are 286 hikers and horse riders per mile of non-motorized trail.

With the exception of the Umpqua National Forest, which has a very small snowmobile trail network, and the couple of coastal forests that receive little snow, most Oregon National Forests' winter trail systems are dedicated mostly for snowmobiles, while cross-country skiers and snowshoers are limited to comparatively fewer miles of trail.

(Recreation use data for the Siuslaw National Forest have not been incorporated into these figures, because most hiking, horse, and ORV use there is on or near beaches rather than on trails. Detailed recreation use data for the Rogue River National Forest are not available.)

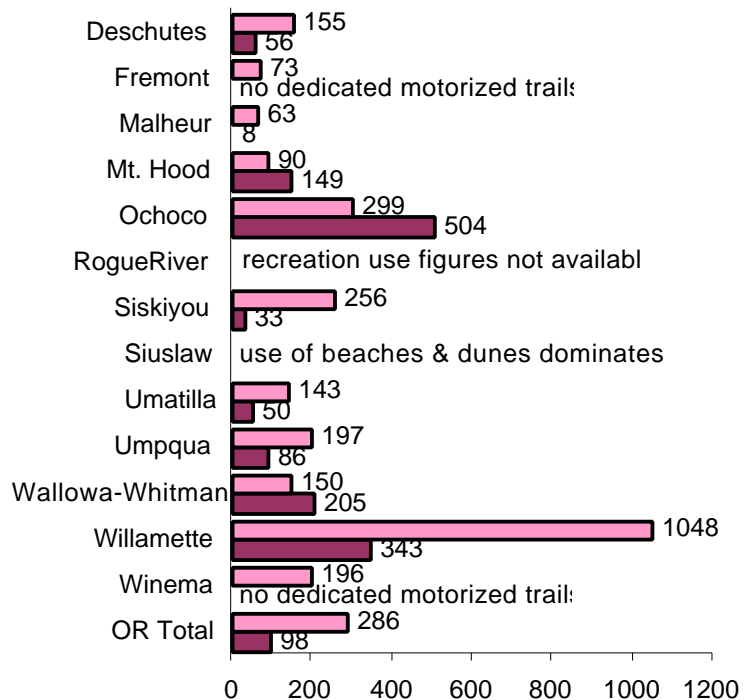
### Ratio of motorized vs. non-motorized access routes

(miles of roads + motorized trails)/  
miles of non-motorized trails



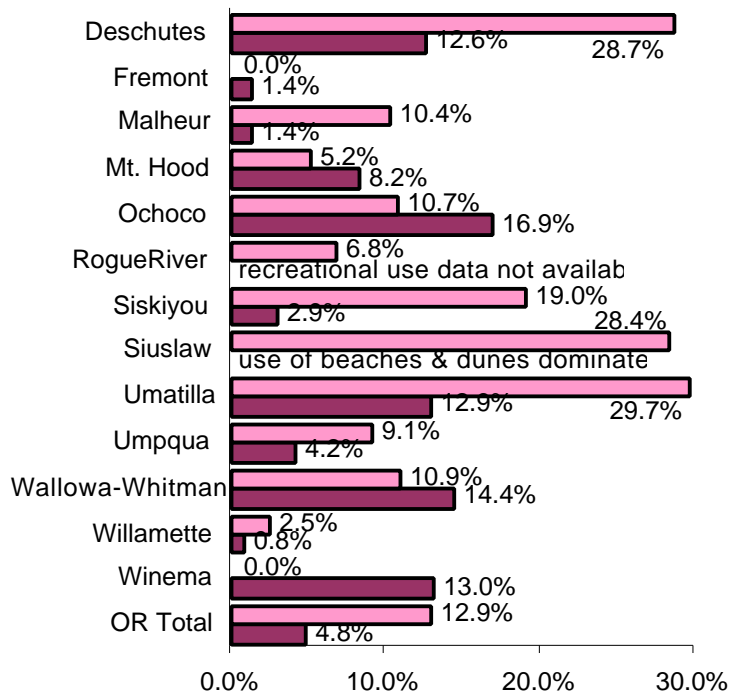
### Users Per Mile of Trail

Non-motorized users/mile of non-motorized trail ■  
Motorized users/mile of motorized trail ■



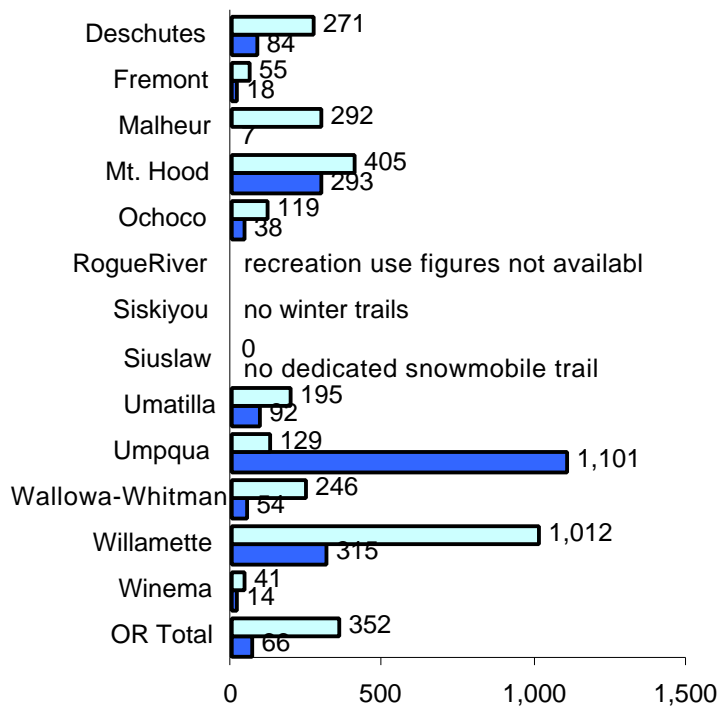
### Fraction of trails & users that are motorized

Percentage of trail miles open to motor vehicle ■  
 Percentage of trail users riding motor vehicles ■



### Winter Users Per Mile of Trail

(XC skiers+snowshoers)/mile of non-motorized trail ■  
 Snowmobile users/mile of motorized trail ■



## Motorization of Washington's National Forests

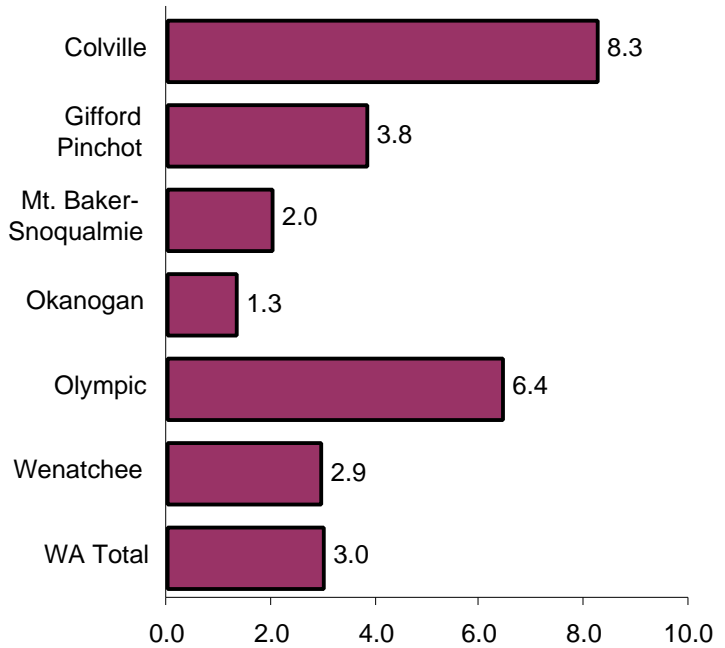
A network of 16,129 miles of roads in Washington National Forests, combined with 1,962 miles of motorized trails, is available for dirtbikes and other motor vehicles to ride on. About 6,065 miles of trails are closed to motor vehicles and dedicated for quiet hiking, backpacking, and horse riding. A little under half—2,834 miles—of these non-motorized trails are outside of designated Wilderness.

The National Forests in Washington have an average of 55 dirtbike or ATV riders per mile of motorized trail each year. This compares to 210 non-motorized recreationists (hikers, backpackers, and horse riders) per mile of dedicated non-motorized trail. In a National Forest System that dedicates about a quarter of all trails—24.4 percent—for motor vehicle use, only 7.8 percent of trail users are motorized.

These unfair ratios are worst on the Wenatchee National Forest, where 70.8 percent of non-Wilderness trails are open to dirtbikes and ATVs, yet only 4.6 percent of trail users are motorized. The Gifford Pinchot National Forest dedicates 27.6 percent of its trail network for motorized use, yet such users are only 6.5 percent of the trail users.

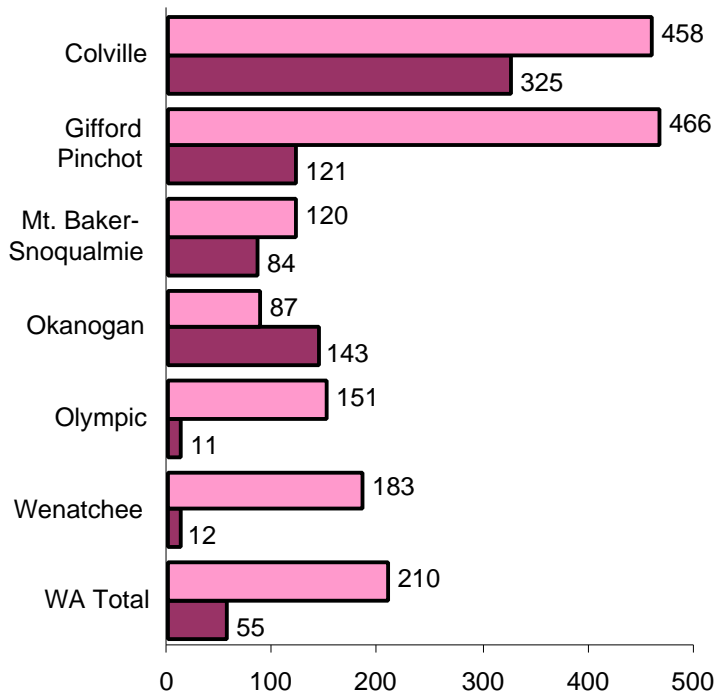
### Ratio of motorized vs. non-motorized access routes

(miles of roads + motorized trails)/  
miles of non-motorized trails



### Users Per Mile of Trail

Non-motorized users/mile of non-motorized trail ■  
Motorized users/mile of motorized trail ■

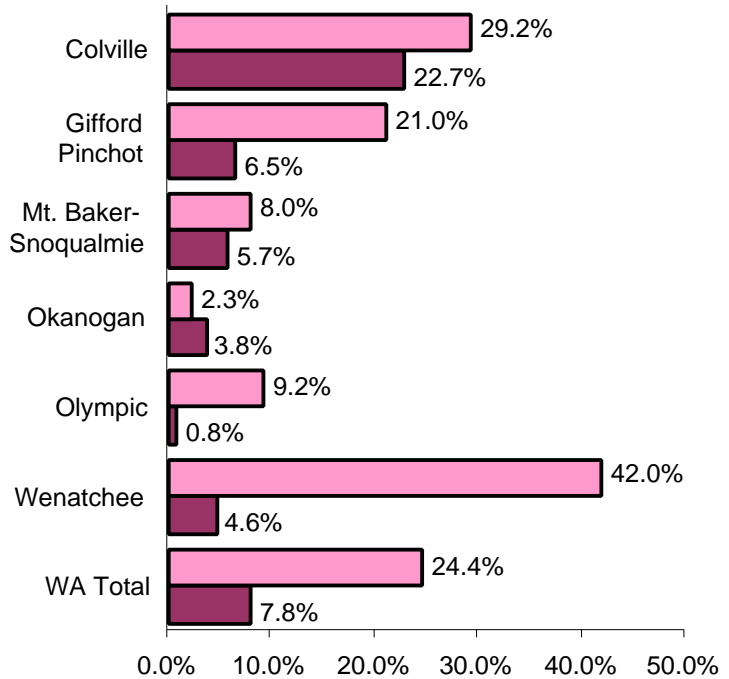


Most National Forests in Washington have small networks of cross-country ski trails compared to the extensive networks for snowmobiles. For example, on the Colville National Forest near Spokane, 93 percent of the winter trail system is for snowmobiles, who are only 46 percent of the winter trail users.

Even the Mt. Baker-Snoqualmie National Forest, near urban centers of Puget Sound, has 61 percent of its winter trails open to the 19 percent of winter trail users who ride snowmobiles. The result is that ten times as many non-motorized winter recreationists are packed onto each mile of dedicated non-motorized trail, compared to snowmobile riders.

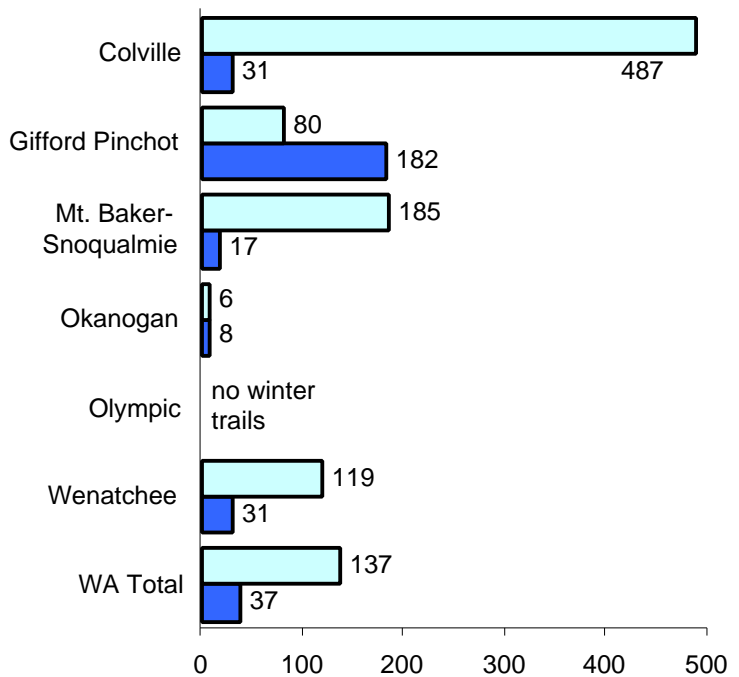
### Fraction of trails & users that are motorized

Percentage of trail miles open to motor vehicle ■  
 Percentage of trail users riding motor vehicle ■



### Winter Users Per Mile of Trail

(XC skiers+snowshoers)/mile of non-motorized trail ■  
 Snowmobile users/mile of motorized trail ■



## Motorization of Wyoming's National Forests

The National Forests and Grasslands of Wyoming are crisscrossed by 7,939 miles of roads open to the public. These, plus 544 miles of summer-season trails and 1,789 miles of winter trails, are all available for motorized recreation. In comparison, 4,670 miles of summer trails are closed to motor vehicles; of this, 2,419 miles is outside designated Wilderness. There are an additional 177 miles of cross-country ski trails closed to snowmobiles.

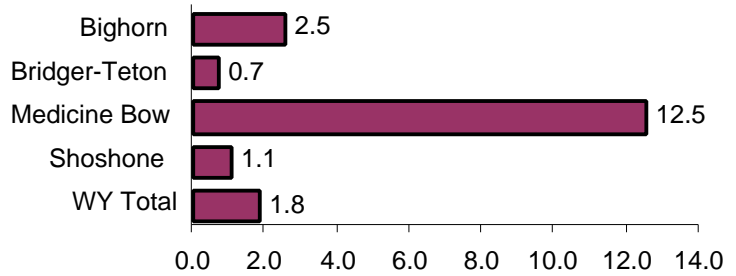
The result is that there are 1.8 times as many summertime motorized travel routes in the state as there are non-motorized trails where recreationists can escape machines. In the winter, the ratio is ten to one.

The Bighorn and Medicine Bow National Forests are most tilted toward motorized use. The Medicine Bow has 49 percent of Wyoming's National Forest road system. A third of the trail system of the Bighorn is open to dirtbikes and ATVs (40.6 percent of the trail system outside Wilderness), yet they make up only 13.2 percent of trail users. Three times as many hikers, backpackers, and horse riders must share each mile of non-motorized trail, compared to the number of dirtbike and ATV riders on each mile of motorized trail.

A preponderance (91 percent) of the National Forests' winter-season trails are dedicated for snowmobiles. Each year an average of 509 snowshoers and cross-country skiers crowd onto each mile of dedicated non-motorized trails, compared to 186 snowmobile riders per mile of motorized trail.

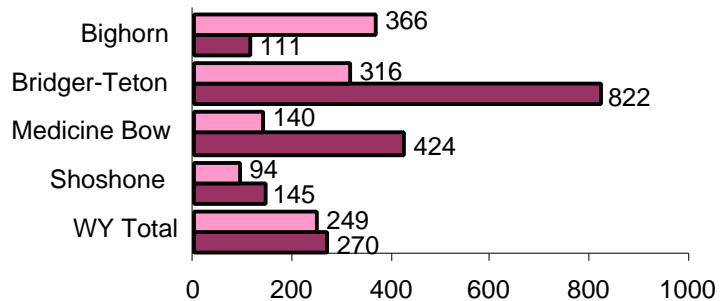
### Ratio of motorized vs. non-motorized access routes

(miles of roads + motorized trails)/  
miles of non-motorized trails



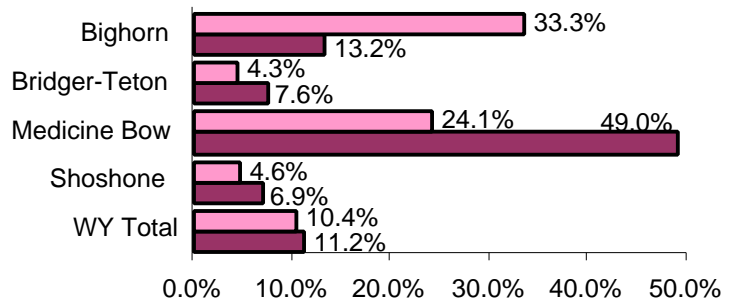
### Users Per Mile of Trail

Non-motorized users/mile of non-motorized trail  
Motorized users/mile of motorized trail



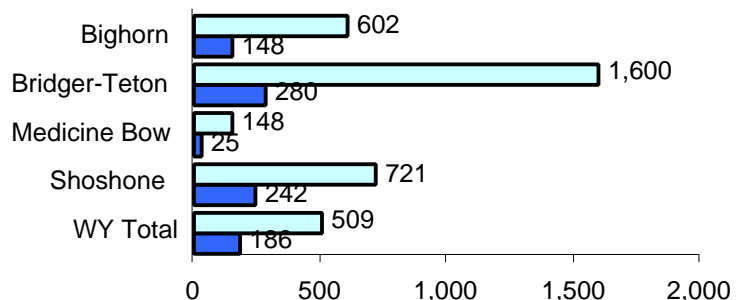
### Fraction of trails & users that are motorized

Percentage of trail miles open to motor vehicle  
Percentage of trail users riding motor vehicles



### Winter Users Per Mile of Trail

(XC skiers+snowshoers)/mile of non-motorized trail  
Snowmobile users/mile of motorized trail



## Motorization of the Prairie States' National Forests and Grasslands

Roads now dominate the landscape of much of the National Forests and Grasslands of the prairie states. South Dakota has an astounding 4,567 miles of road open to the public, mostly on the Black Hills National Forest—one of the highest densities per land area of any National Forest in the nation.

Even North Dakota's Dakota Prairie National Grassland has 2,800 miles of roads open to the public. Nebraska's National Forest and Grassland units have a comparatively small 332 miles of open roads.

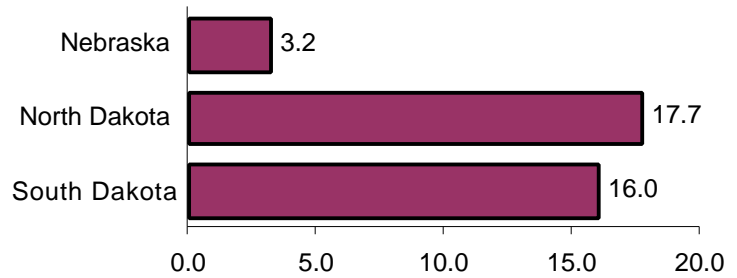
Few formal trails of any kind exist on these forests and grasslands. While cross-country walking on the grasslands can be easy, there are few dedicated trails for hikers to enjoy. Nebraska, North Dakota, and South Dakota have respectively 286, 158, and 103 miles of summer-season trails. Only 9.4 miles are in Wilderness in Nebraska, and 22 miles in Wilderness in South Dakota.

From 3.2 to 17.7 times as many roads are available for motorized recreation, including dirtbike and ATV riding, as there are trails closed to motorized use. Few trails are open to motor vehicles (17 miles in South Dakota), so most dirtbike and ATV riding is on roads. The lack of trails leads to particularly heavy crowding on the Black Hills National Forest, where each year over 800 hikers, backpackers, and horse riders share each mile of trail.

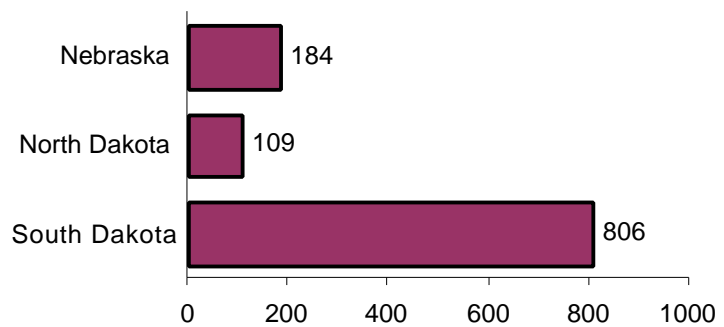
Winter trails are also limited and are located mostly on the Black Hills National Forest, where there are 407 miles open to snowmobiles and 75.5 miles dedicated to cross-country skiing and snowshoeing.

### Ratio of motorized vs. non-motorized access routes

(miles of roads + motorized trails)/  
miles of non-motorized trails



### Nonmotorized Users Per Mile of Nonmotorized Trail



# Conclusions & Solutions

Off-road vehicles such as dirtbikes and ATVs cause major impacts to wildlife and fish habitat and native ecosystems in the remaining wild areas of the National Forests. These machines also create major conflicts with the quiet, slower-paced recreation of pedestrians and other non-motorized users. The machines can permanently harm trails, soils, and native plant communities

## Fairness needs to be restored

This report has shown that on the whole, many more opportunities for recreation on motorized trails and roads are available to ORV riders than are available to the far greater numbers of hikers and horse riders. There are enough open roads on the region's National Forests and Grasslands to go around the Earth five times. Similar discrepancies occur in winter recreation between snowmobiles and cross country skiers and snowshoers.

Many National Forests have a large majority of their trails open to motor vehicles, particularly in Idaho and Montana, in some cases as high as 79 percent. On the Gallatin National Forest, 96 percent of the non-Wilderness trail miles are open to motors. Even near the largest metropolitan area in the eight states, with burgeoning numbers of hikers and backpackers crowding the trails, the Wenatchee National Forest has 71 percent of its non-Wilderness trails open to motor vehicles.

Yet according to Forest Service visitor estimates from the late-1990s (see citations in Appendix), dirtbike and ATV riders are typically a much smaller proportion of all trail users than the proportion of trail miles open to dirtbikes and ATVs. Given the impacts and conflicts created by these motor vehicles, and the need to create more non-motorized trail opportunities in many areas, it is time to create a fairer balance of trail opportunities.

## A new opportunity

President Clinton's October 1999 proposal to protect all National Forest roadless areas presents a real opportunity to start addressing these mounting problems and to restore more fairness to trail uses. The figures in this report show the vast mileage of roads now open to recreation that will not be touched by Clinton's proposal.

The thrust of his policy is to protect roadless areas from new road construction and harmful development. Off-road vehicle use contributes substantially to the degradation of our remaining wildlands and must be considered in the same category as logging, road construction, oil and gas development, and mining. The impacts of ORVs are pervasive, very widespread, affect many ecological values, and are growing each year. If ORV use continues to grow unabated in our wild areas, critical wildlife habitats will be degraded and native plant and animal populations will suffer, particularly rare species sensitive to human disturbance. The roadless area protection plan will not meet the President's goals unless ORV use is restricted.

## Specific steps needed

New restrictions on ORVs should be implemented along with restrictions of logging and other resource development in the roadless areas. As a start, the Forest Service should suspend construction or reconstruction of all ORV trails in roadless areas, including roadless lands not included in its inventories. Within roadless areas there should be no further conversion of hiking and horse trails to ORV trails.

The Forest Service should then begin to move ORVs out of roadless areas and into less sensitive areas. The vast network of roads on the National Forests is available for use by dirtbikes, ATVs, and jeeps, and the agency should seek funding to make that system more suitable for these recreationists. "Road to trail" conversion is becoming a standard practice in

many areas as some unneeded logging roads are closed to restore watersheds, combining benefits for watersheds with benefits for recreation. There has been good success in a few areas dedicating ORV riding areas that use interconnected networks of old roads as ORV trails. This is a common feature of state forest lands, yet the Forest Service has preferred to disperse ORVs across wild, roadless landscapes.

At the same time that ORVs are moved to more restricted areas, damaged sites in roadless areas must be inventoried, evaluated, and scheduled for restoration. Likewise, thousands of miles of trails are in extremely poor condition because of past ORV abuse, and plans need to be made and funding secured to restore those trails. Both of these actions will have substantial costs, but if the Forest Service is no longer spending money building new roads into roadless areas and designing timber sales there, then dollars that used to go for timber subsidies are available for Congress and the Forest Service to reprogram for restoration and development of more suitable ORV facilities.

## **State and federal funding programs need overhaul**

State and federal programs that fund harmful ORV trail projects on the National Forests must be overhauled. There should be no further ORV capital or maintenance projects funded within roadless areas.

The funding mechanisms must be overhauled to more accurately reflect the preponderance of non-motorized recreationists using the National Forests' trails and roadless areas. Most state agencies and commissions that decide on fund allocation are dominated by representatives of motorized vehicle users, with the result that most funding goes for projects to benefit ORVs. For example, since 1971 eighty percent of all Washington state trail program funding has gone to build motorized trail projects (e.g. in Figure 5), even though there are four times as many hikers in the state as dirtbike riders.

The same problem occurs with the National Recreation Trails Program (NRTP) that allocates federal transportation to states for recreation programs. Thirty percent of the NRTP funds are dedicated for motorized trail projects, another thirty percent for non-motorized trail projects, and the remaining forty percent is subject to competitive grant applications for either motorized or non-motorized projects. (Federal Highway Administration 2000). Applications for the latter forty percent are reviewed by the same biased state agencies and commissions, so the money tends to be spent heavily on motorized projects.

Any future NRTP and state trails funding for ORV trails should go only for maintenance, signing, parking, education, and law enforcement outside of roadless areas and in areas where ORV use is most suitable. NRTP grant-making policies and procedures should be adjusted to meet the goals of President Clinton's roadless area initiative, to halt further funding of ORV projects in roadless areas, and to repair the enormous trail damage caused by ORVs in roadless areas.

With the hoped-for elimination of logging, new roads, and other harmful development in our remaining wild roadless areas under Clinton's proposal, off-road vehicle use is among the most important remaining human impacts to National Forest wildlands. The measures discussed here will go a long way toward reducing ORV impacts and developing replacement destinations for ORV riders.

However, any measures instituted for roadless areas by the President and the Forest Service may only be temporary. The ultimate, lasting protection of Wilderness designation should be granted to our remaining wildlands. Wilderness protection has stood since 1964 as the strongest measure to protect lands from motor vehicles, mining, logging, road construction, dams, powerlines, oil and gas drilling, pipelines, and new permanent structures of any kind. Establishing new Wilderness areas in the eight

states first explored by Lewis and Clark can finally assure Americans that a few remaining pieces of the original wild America will remain, untrammelled by our modern machines.

# References

- Anderson, Michael 1997. *Idaho's Vanishing Wildlands: A Status Report on Roadless Areas in Idaho's National Forests*, The Wilderness Society, Washington, D.C.
- Brown, K. J. 1994. "River-Bed Sedimentation Caused by Off-Road Vehicles at River Fords in the Victorian Highlands, Australia." *Water Resources Bulletin* 30, No. 2.
- Bureau of Land Management and Forest Service October 1999. *Off-Highway Vehicle Environmental Impact Statement and Plan Amendment for Montana, North Dakota and Portions of South Dakota*. BLM Montana State Office, Billings, and Forest Service Northern Regional Office, Missoula, MT.
- Cordell, H. Ken et al. 1999. "Outdoor Recreation Participation Trends." In: Cordell, H. Ken et al., *Outdoor Recreation in American Life: a national assessment of demand and supply trends*. Sagamore Publishing, Champaign, IL, p. 239.
- Dombeck, Michael 1999. "Conservation for a New Century." U.S.D.A. Forest Service Speech, Madison, WI, October 7, 1999. (Available at <http://www.fs.fed.us/intro/speech/199910007.html>)
- Federal Highway Administration 1999. *Recreational Trails Program Brochure*. U.S. Department of Transportation, Washington, D.C. (Available at <http://www.fhwa.dot.gov/environment/rtbroch.htm>)
- Forest Service May 2000. *Forest Service Roadless Area Conservation, Draft Environmental Impact Statement*. Washington, D.C., Vol. 1, B-3 and B-4.
- Friends of the Earth and Wildlands Center for Preventing Roads 1998. *Trails of Destruction: How Off-Road Vehicles Gain Access and Funding on Public Lands*. FOE, Washington, DC. (Available at <http://www.foe.org>)
- Mahoney, John F. et al. 1995. *State Comprehensive Outdoor Recreation Plan*. Wyoming Department of Commerce, Division of State Parks & Historic Sites (undated), p. 62.
- Mattson, D.J. and R. Knight 1991. "Effects of Access on Human-Caused Mortality of Yellowstone Grizzly Bears." *USDI National Park Service, Interagency Grizzly Bear Study Team Report*.
- McCool, Stephen F., and Justin Harris 1994. *The Montana Trail Users Study*. Research Report 35, Institute for Tourism and Recreation Research, School of Forestry, University of Montana, Missoula, MT, August 1994, p. 3.
- Morrison, Peter, Susan Snetsinger, and George Wooten 1998. *Unprotected Wild Lands in Washington State: An Analysis of Their Current Status and Future under Current Management Direction*. Pacific Biodiversity Institute, Winthrop, WA, p. 4. (Available at <http://www.pacificbio.org/roadless-mapping/Washington-roadless/roadless-report.html>)
- National Park Service 1999. *Winter Use Plan Draft Environmental Impact Statement for the Yellowstone and Grand Teton National Parks and John D. Rockefeller Jr. Memorial Parkway*. U.S. Department of Interior NPS, July 1999.
- National Park Service 2000. *Air quality concerns related to snowmobile usage in National Parks*. U.S. Department of Interior NPS, Air Resources Division. Denver, Colorado, February 2000.
- Rothstein, Barbara J. 1999. *Order Granting Plaintiffs' Motion for a Preliminary Injunction*. In: North Cascades Conservation Council et al. *V. U.S. Forest Service et al.* U.S. District Court, Western District of Washington (unpublished), Seattle, WA, Case No. C99-889R, Aug. 31, 1999, p. 17.
- Sachet, Glen A., *Wildlife Evaluation Processes for ORV, Hiking, and Horse Backcountry Recreation*

*Use in Washington Forests.* Washington Department of Wildlife, Olympia, WA, p. 47.

University of Montana. (Available at <http://www.wilderness.net>)

State of Idaho 1993(?). *Idaho Trails Plan 1993.* Idaho Department of Parks and Recreation (undated), pp. 69-72.

State of Nebraska 1994. *A Network of Discovery: A Comprehensive Trails Plan for the State of Nebraska 1994.* Nebraska Energy Office and Nebraska Department of Economic Development, July 1994, p. 12.

State of North Dakota 1996(?). *North Dakota State Comprehensive Outdoor Recreation Plan 1996-2000.* North Dakota Parks and Recreation Department (undated), p. 39.

State of Oregon 1994. *Oregon Outdoor Recreation Plan 1994-1999.* Oregon Parks and Recreation Department. December 1, 1994, p. III-12.

State of South Dakota 1993. *South Dakota Comprehensive Outdoor Recreation Plan, 1992.* Division of Parks and Recreation, Pierre, SD, January 1993, pp. 2-14 through -17.

State of Washington 1991. *Washington State Trails Plan: Policy and Action Document 1991.* Interagency Committee for Outdoor Recreation. Tumwater, WA, June, 1991, p. 12.

Tyser, R. W., and C. H. Key 1988. "Spotted knapweed in natural area fescue grasslands: An ecological assessment." *Northwest Science* 62, 151-160.

Tyser, R. W. 1992. "Vegetation associated with two alien plant species in a fescue grassland in Glacier National Park, Montana." *Great Basin Naturalist* 52, 198-193.

Wilderness Information Network 2000. Worldwide Web-based database of all federal Wilderness areas. Sponsored by National Park Service, U.S.D.A. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service, and the Wilderness Institute at the

# Appendix

## Roads

| Unit                      | Region | Road Mileage Open to Public |               |                | Reference |
|---------------------------|--------|-----------------------------|---------------|----------------|-----------|
|                           |        | High-clearance              | Low-clearance | Total          |           |
| Boise                     | 4      | 3,004                       | 874           | 3,878          | 8         |
| Caribou                   | 4      | 1,162                       | 504           | 1,667          | 8         |
| Clearwater                | 1      | 1,670                       | 1,252         | 2,922          | 18        |
| Idaho Panhandle           | 1      | 3,795                       | 2,197         | 5,992          | 18        |
| Nez Perce                 | 1      | 970                         | 929           | 1,899          | 18        |
| Payette                   | 4      | 1,769                       | 876           | 2,645          | 8         |
| Salmon-Challis            | 4      | 1,931                       | 718           | 2,649          | 8         |
| Sawtooth                  | 4      | 1,501                       | 502           | 2,003          | 8         |
| Targhee                   | 4      | 787                         | 528           | 1,315          | 8         |
| <b>Idaho Total</b>        |        | <b>16,589</b>               | <b>8,381</b>  | <b>24,970</b>  |           |
| Beaverhead-Deerlodge      | 1      | 2,748                       | 1,930         | 4,678          | 18        |
| Bitterroot                | 1      | 1,021                       | 916           | 1,937          | 18        |
| Custer                    | 1      | 2,807                       | 887           | 3,694          | 18        |
| Flathead                  | 1      | 724                         | 1,048         | 1,772          | 18        |
| Gallatin                  | 1      | 1,294                       | 328           | 1,622          | 18        |
| Helena                    | 1      | 1,045                       | 447           | 1,492          | 18        |
| Kootenai                  | 1      | 2,068                       | 1,683         | 3,751          | 18        |
| Lewis and Clark           | 1      | 713                         | 603           | 1,316          | 18        |
| Lolo                      | 1      | 2,095                       | 1,900         | 3,995          | 18        |
| <b>Montana Total</b>      |        | <b>14,515</b>               | <b>9,742</b>  | <b>24,257</b>  |           |
| Nebraska NF (Nebr. units) | 2      | 258                         | 74            | 332            | 2, 34     |
| <b>Nebraska Total</b>     |        | <b>258</b>                  | <b>74</b>     | <b>332</b>     |           |
| Dakota Prairie            | 1      | 2,200                       | 600           | 2,800          | 7         |
| <b>North Dakota Total</b> |        | <b>2,200</b>                | <b>600</b>    | <b>2,800</b>   |           |
| Deschutes                 | 6      | 7,369                       | 444           | 7,813          | 3         |
| Fremont                   | 6      | 3,942                       | 952           | 4,894          | 3         |
| Malheur                   | 6      | 5,063                       | 1,122         | 6,185          | 3         |
| Mt. Hood                  | 6      | 2,151                       | 836           | 2,987          | 3         |
| Ochoco                    | 6      | 2,922                       | 321           | 3,243          | 3         |
| Rogue River               | 6      | 2,087                       | 513           | 2,600          | 3         |
| Siskiyou                  | 6      | 2,013                       | 532           | 2,545          | 3         |
| Siuslaw                   | 6      | 1,880                       | 359           | 2,239          | 3         |
| Umatilla                  | 6      | 1,982                       | 787           | 2,769          | 3         |
| Umpqua                    | 6      | 2,452                       | 1,170         | 3,622          | 3         |
| Wallowa-Whitman           | 6      | 4,316                       | 790           | 5,106          | 3         |
| Willamette                | 6      | 4,090                       | 1,572         | 5,662          | 3         |
| Winema                    | 6      | 3,188                       | 1,063         | 4,251          | 3         |
| <b>Oregon Total</b>       |        | <b>43,455</b>               | <b>10,461</b> | <b>53,916</b>  |           |
| Black Hills               | 2      | 3,403                       | 708           | 4,111          | 2         |
| other NF & NG units in SD |        | 355                         | 101           | 456            | 2, 33     |
| <b>South Dakota Total</b> |        | <b>3,758</b>                | <b>809</b>    | <b>4,567</b>   |           |
| Colville                  | 6      | 2,277                       | 380           | 2,657          | 3         |
| Gifford Pinchot           | 6      | 2,754                       | 825           | 3,579          | 3         |
| Mt. Baker-Snoqualmie      | 6      | 868                         | 1,174         | 2,042          | 3         |
| Okanogan                  | 6      | 858                         | 1,046         | 1,904          | 3         |
| Olympic                   | 6      | 1,184                       | 455           | 1,639          | 3         |
| Wenatchee                 | 6      | 3,239                       | 1,069         | 4,308          | 3         |
| <b>Washington Total</b>   |        | <b>11,180</b>               | <b>4,949</b>  | <b>16,129</b>  |           |
| Bighorn                   | 2      | 817                         | 277           | 1,094          | 2         |
| Bridger-Teton             | 4      | 1,069                       | 588           | 1,657          | 8         |
| Medicine Bow              | 2      | 2,913                       | 945           | 3,858          | 2         |
| Shoshone                  | 2      | 1,069                       | 261           | 1,330          | 2         |
| <b>Wyoming Total*</b>     |        | <b>5,868</b>                | <b>2,071</b>  | <b>7,939</b>   |           |
| <b>8-State Total</b>      |        | <b>97,823</b>               | <b>37,087</b> | <b>134,910</b> | <b>0</b>  |

# Trails

| Unit                      | Summer Trail Mileage |               |               |               | Winter Trail Mileage |              | Reference     |
|---------------------------|----------------------|---------------|---------------|---------------|----------------------|--------------|---------------|
|                           | Non-motorized        | Motorized     | Total         | (Wilderness)  | Snowmobile           | XC Ski       |               |
| Boise                     | 283                  | 1,057         | 1,340         | 0             | 300                  | 30           | 4             |
| Caribou                   | 348                  | 945           | 1,293         | 0             | 400                  | 23           | 4             |
| Clearwater                | 726                  | 1,398         | 2,124         | 384           | 74                   | 23           | 1             |
| Idaho Panhandle           | 769                  | 2,437         | 3,205         | 36            | 1,306                | 79           | 1             |
| Nez Perce                 | 2,001                | 1,627         | 3,628         | 1,726         | 360                  | 15           | 1             |
| Payette                   | 1,205                | 1,016         | 2,221         | 715           | 300                  | 20           | 4             |
| Salmon-Challis            | 1,425                | 1,685         | 3,110         | 1,245         | 325                  | 20           | 4             |
| Sawtooth                  | 849                  | 972           | 1,821         | 247           | 600                  | 120          | 4             |
| Targhee                   | 880                  | 540           | 1,420         | 171           | 600                  | 60           | 4             |
| <b>Idaho Total</b>        | <b>8,486</b>         | <b>11,677</b> | <b>20,163</b> | <b>4,525</b>  | <b>4,265</b>         | <b>390</b>   |               |
| Beaverhead-Deerlodge      | 1,029                | 2,452         | 3,481         | 291           | 614                  | 144          | 1             |
| Bitterroot                | 957                  | 636           | 1,593         | 813           | 85                   | 12           | 1             |
| Custer                    | 368                  | 17            | 385           | 167           | 0                    | 31           | 1, 16         |
| Flathead                  | 1,399                | 861           | 2,259         | 1,157         | 149                  | 24           | 1             |
| Gallatin                  | 828                  | 2,024         | 2,852         | 738           | 314                  | 64           | 1             |
| Helena                    | 597                  | 606           | 1,202         | 185           | 276                  | 17           | 1             |
| Kootenai                  | 942                  | 719           | 1,661         | 79            | 165                  | 34           | 1             |
| Lewis and Clark           | 814                  | 1,609         | 2,423         | 468           | 118                  | 44           | 1             |
| Lolo                      | 1,122                | 1,672         | 2,794         | 171           | 113                  | 34           | 1             |
| <b>Montana Total</b>      | <b>8,055</b>         | <b>10,595</b> | <b>18,650</b> | <b>4,070</b>  | <b>1,834</b>         | <b>404</b>   |               |
| Nebraska NF (Nebr. units) | 103                  | 0             | 103           | 9             | 0                    | 0            | 14            |
| <b>Nebraska Total</b>     | <b>103</b>           | <b>0</b>      | <b>103</b>    | <b>9</b>      | <b>0</b>             | <b>0</b>     |               |
| Dakota Prairie            | 158                  | 0             | 158           | 0             | 22                   | 0            | 12            |
| <b>North Dakota Total</b> | <b>158</b>           | <b>0</b>      | <b>158</b>    | <b>0</b>      | <b>22</b>            | <b>0</b>     |               |
| Deschutes                 | 850                  | 343           | 1,193         | 246           | 477                  | 214          | 6             |
| Fremont                   | 392                  | 0             | 392           | 17            | 190                  | 35           | 6             |
| Malheur                   | 454                  | 52            | 506           | 138           | 515                  | 7            | 6             |
| Mt. Hood                  | 930                  | 51            | 980           | 352           | 46                   | 131          | 6             |
| Ochoco                    | 208                  | 25            | 233           | 4             | 84                   | 36           | 6             |
| Rogue River               | 441                  | 32            | 473           | 167           | 152                  | 67           | 6             |
| Siskiyou                  | 400                  | 94            | 493           | 217           | 0                    | 0            | 6             |
| Siuslaw                   | 150                  | 60            | 210           | 15            | 0                    | 7            | 6             |
| Umatilla                  | 580                  | 245           | 825           | 425           | 263                  | 20           | 6             |
| Umpqua                    | 475                  | 48            | 523           | 144           | 9                    | 40           | 6             |
| Wallowa-Whitman           | 1,594                | 195           | 1,788         | 890           | 845                  | 61           | 6             |
| Willamette                | 1,329                | 35            | 1,363         | 608           | 176                  | 138          | 6             |
| Winema                    | 133                  | 0             | 133           | 57            | 332                  | 64           | 6             |
| <b>Oregon Total</b>       | <b>7,934</b>         | <b>1,178</b>  | <b>9,112</b>  | <b>3,279</b>  | <b>3,088</b>         | <b>818</b>   |               |
| Black Hills               | 286                  | 17            | 303           | 22            | 407                  | 76           | 2, 13, 16, 17 |
| other NF & NG units in SD | 0                    | 0             | 0             | 0             | 0                    | 0            | 13            |
| <b>South Dakota Total</b> | <b>286</b>           | <b>17</b>     | <b>303</b>    | <b>22</b>     | <b>407</b>           | <b>76</b>    |               |
| Colville                  | 339                  | 140           | 479           | 37            | 476                  | 35           | 6             |
| Gifford Pinchot           | 1,003                | 267           | 1,270         | 305           | 175                  | 125          | 6             |
| Mt. Baker-Snoqualmie      | 1,056                | 92            | 1,148         | 575           | 202                  | 128          | 6             |
| Okanogan                  | 1,466                | 35            | 1,501         | 855           | 448                  | 77           | 6             |
| Olympic                   | 260                  | 27            | 287           | 96            | 0                    | 0            | 6             |
| Wenatchee                 | 1,940                | 1,402         | 3,342         | 1,363         | 1,055                | 147          | 6             |
| <b>Washington Total</b>   | <b>6,065</b>         | <b>1,962</b>  | <b>8,027</b>  | <b>3,231</b>  | <b>2,356</b>         | <b>513</b>   |               |
| Bighorn                   | 534                  | 267           | 801           | 143           | 367                  | 56           | 27            |
| Bridger-Teton             | 2,540                | 115           | 2,655         | 1,181         | 788                  | 20           | 4             |
| Medicine Bow              | 316                  | 100           | 416           | 78            | 436                  | 85           | 15, 35        |
| Shoshone                  | 1,281                | 62            | 1,343         | 849           | 198                  | 17           | 2             |
| <b>Wyoming Total*</b>     | <b>4,670</b>         | <b>544</b>    | <b>5,215</b>  | <b>2,251</b>  | <b>1,789</b>         | <b>177</b>   |               |
| <b>8-State Total</b>      | <b>35,756</b>        | <b>25,974</b> | <b>61,730</b> | <b>17,388</b> | <b>13,760</b>        | <b>2,377</b> |               |

## Recreational visitor days

| Unit                      | Recreational Visitor Days, thousands (to nearest 0.1) |                |                   |              |              |                | Reference |
|---------------------------|---|----------------|-------------------|--------------|--------------|----------------|-----------|
|                           | hiking & walking                                      | horse riding   | xc ski & snowshoe | dirtbike     | ATV          | snowmobile     |           |
| Boise                     | 46.0  | 20.1           | 38.3              | 66.8         | 5.5          | 87.5           | 30        |
| Caribou                   | 26.8  | 25.6           | 12.0              | 31.1         | 3.0          | 28.8           | 30        |
| Clearwater                | 63.4  | 49.7           | 14.1              | 38.3         | 1.6          | 42.7           | 1         |
| Idaho Panhandle           | 120.6   | 38.4           | 39.0              | 67.6         | 14.2         | 136.3          | 1         |
| Nez Perce                 | 22.8  | 25.9           | 11.9              | 20.6         | 0.1          | 18.1           | 1         |
| Payette                   | 64.9  | 69.3           | 3.8               | 36.9         | 14.7         | 21.4           | 30        |
| Salmon-Challis            | 70.8  | 72.1           | 0.0               | 21.0         | 6.3          | 18.0           | 30        |
| Sawtooth                  | 118.6   | 42.2           | 35.0              | 46.4         | 2.9          | 41.4           | 30        |
| Targhee                   | 35.2  | 35.6           | 40.4              | 35.4         | 2.2          | 237.0          | 30        |
| <b>Idaho Total</b>        | <b>569.1</b>  | <b>378.9</b>   | <b>194.5</b>      | <b>364.1</b> | <b>50.5</b>  | <b>631.2</b>   |           |
| Beaverhead-Deerlodge      | 119.6   | 55.7           | 34.3              | 40.5         | 14.8         | 146.6          | 1         |
| Bitterroot                | 102.6   | 56.5           | 10.4              | 10.6         | 0.0          | 12.7           | 1         |
| Custer                    | 52.3  | 23.6           | 8.1               | 11.3         | 0.1          | 7.4            | 37        |
| Flathead                  | 50.2  | 38.9           | 9.7               | 4.9          | 0.5          | 19.4           | 1         |
| Gallatin                  | 206.2   | 109.0          | 60.5              | 41.4         | 8.3          | 175.3          | 1         |
| Helena                    | 19.2  | 16.8           | 17.9              | 13.8         | 13.1         | 13.1           | 1         |
| Kootenai                  | 69.0  | 15.0           | 20.3              | 12.1         | 1.2          | 22.4           | 1         |
| Lewis and Clark           | 69.8  | 83.4           | 6.6               | 55.4         | 39.2         | 36.7           | 1         |
| Lolo                      | 125.5   | 44.8           | 37.3              | 43.4         | 11.4         | 48.5           | 1         |
| <b>Montana Total</b>      | <b>814.4</b>  | <b>443.7</b>   | <b>205.1</b>      | <b>233.4</b> | <b>88.6</b>  | <b>482.1</b>   |           |
| Nebraska NF (Nebr. units) | 17.8  | 1.2            | 0.1               | 1.1          | 0.0          | 0.2            | 31        |
| <b>Nebraska Total</b>     | <b>17.8</b>   | <b>1.2</b>     | <b>0.1</b>        | <b>1.1</b>   | <b>0.0</b>   | <b>0.2</b>     |           |
| Dakota Prairie            | 5.6   | 11.6           | 0.3               | 2.6          | 0.0          | 1.6            | 37        |
| <b>North Dakota Total</b> | <b>5.6</b>  | <b>11.6</b>    | <b>0.3</b>        | <b>2.6</b>   | <b>0.0</b>   | <b>1.6</b>     |           |
| Deschutes                 | 111.5   | 20.6           | 58.0              | 10.3         | 8.8          | 40.2           | 11        |
| Fremont                   | 24.7  | 3.9            | 1.9               | 0.4          | 0.0          | 3.4            | 11        |
| Malheur                   | 24.7  | 3.9            | 1.9               | 0.4          | 0.0          | 3.4            | 11        |
| Mt. Hood                  | 75.9  | 7.6            | 52.9              | 6.9          | 0.6          | 13.4           | 11        |
| Ochoco                    | 42.8  | 19.3           | 4.3               | 7.2          | 5.4          | 3.2            | 11        |
| Rogue River               |   |                |                   |              |              |                | 11        |
| Siskiyou                  | 96.2  | 6.0            | 2.0               | 2.2          | 0.9          | 0.2            | 11        |
| Siuslaw                   | 396.5†  | 13.5†          | 0.0               | 4.8†         | 348.2†       | 0.0            | 11†       |
| Umatilla                  | 58.0  | 25.0           | 3.9               | 6.2          | 6.1          | 24.1           | 11        |
| Umpqua                    | 88.9  | 4.5            | 5.2               | 2.5          | 1.6          | 9.8            | 11        |
| Wallowa-Whitman           | 145.0   | 93.3           | 14.9              | 18.0         | 22.0         | 46.0           | 11        |
| Willamette                | 1,335.7   | 56.4           | 140.0             | 4.3          | 7.6          | 55.3           | 11        |
| Winema                    | 24.4  | 1.6            | 2.6               | 1.1          | 2.8          | 4.5            | 11        |
| <b>Oregon Total</b>       | <b>2,027.8</b>  | <b>242.1</b>   | <b>287.6</b>      | <b>59.5</b>  | <b>55.8</b>  | <b>203.5</b>   |           |
| Black Hills               | 171.9   | 57.6           | 5.1               | 72.0         |              | 126.3          | 9         |
| other NF & NG units in SD | 0.5   | 0.7            | 0.1               | 0.2          | 0.1          | 0.2            | 31, 37    |
| <b>South Dakota Total</b> | <b>172.4</b>  | <b>58.3</b>    | <b>5.2</b>        | <b>72.2</b>  | <b>0.1</b>   | <b>126.5</b>   |           |
| Colville                  | 136.2   | 18.9           | 17.2              | 39.1         | 6.4          | 14.8           | 11        |
| Gifford Pinchot           | 431.9   | 35.5           | 10.0              | 25.7         | 6.6          | 31.7           | 11        |
| Mt. Baker-Snoqualmie      | 124.5   | 2.4            | 23.7              | 5.6          | 2.1          | 3.5            | 11        |
| Okanogan                  | 89.5  | 37.7           | 0.5               | 5.0          | 0.0          | 3.6            | 11        |
| Olympic                   | 38.3  | 0.9            | 1.3               | 0.3          | 0.0          | 0.0            | 11        |
| Wenatchee                 | 325.3   | 30.7           | 17.5              | 14.0         | 3.3          | 33.0           | 11        |
| <b>Washington Total</b>   | <b>1,145.7</b>  | <b>126.1</b>   | <b>70.2</b>       | <b>89.7</b>  | <b>18.4</b>  | <b>86.6</b>    |           |
| Bighorn                   | 118.2   | 77.1           | 33.7              | 21.3         | 8.4          | 54.2           | 36        |
| Bridger-Teton             | 621.5   | 181.0          | 32.0              | 62.5         | 3.1          | 220.3          | 30        |
| Medicine Bow              | 40.2  | 4.0            | 12.5              | 13.2         | 29.2         | 11.1           | 35        |
| Shoshone                  | 68.6  | 52.0           | 11.9              | 8.3          | 0.7          | 48.0           | 10        |
| <b>Wyoming Total*</b>     | <b>848.5</b>  | <b>314.1</b>   | <b>90.1</b>       | <b>105.3</b> | <b>41.4</b>  | <b>333.6</b>   |           |
| <b>8-State Total</b>      | <b>5,601.3</b>  | <b>1,576.0</b> | <b>853.1</b>      | <b>927.9</b> | <b>254.8</b> | <b>1,865.3</b> |           |

## Data references

Numerical references and notes in the preceding data tables are given below. Roads, trails, and recreational visitor days were obtained primarily from Forest Service publications and offices. Data are the latest available.

|    |   |
|----|---|
| 1  | John Favro, Trails Coordinator, "Recreation Site and Area Information, FY-1996," USFS Region 1 (Northern), Missoula, MT, April 4, 2000  |
| 2  | Francisco Valenzuela, Dispersed Recreation Planning & Trails, tables of trail and road miles, (trails by priority use objective), USFS Region 2 (Rocky Mountain), Golden, CO, April 2000  |
| 3  | Jim Abernathy, Engineering, Region 6, table of road miles by maintenance levels 0-5, 1999, provided May 12, 2000  |
| 4  | Randy Welsh, Wilderness, Rivers, & Caves Coordinator, "Trail Miles as of Feb. 2000," USFS Region 4 (Intermountain), Ogden, UT, March 27, 2000   |
| 5  | John Favro, Trails Coordinator, priority objective trails data "Meaningful Measures Spread Sheet," November 1999, provided April 4, 2000  |
| 6  | Chuck Frayer, Accessibility Coordinator, Trail Summary by Activity, April 2000, USFS Region 6 (Pacific Northwest), Portland, OR, March 24, 2000   |
| 7  | John McGuire, Supervisory Civil Engineer, Dakota Prairie NG, Bismarck, ND--estimate, May 5, 2000 (roads inventory being constantly updated)   |
| 8  | Sarah Lau, Civil Engineer, table "Operational Maintenance Level," Region 4, Ogden, UT, for first week in May, 2000 (except Boise NF, which is from 1999 roads report)   |
| 9  | Bill Schleining, Rec. Staff Officer, Black Hills NF, May 9, 2000  |
| 10 | Gary Sutherland, Trails Coordinator, Shoshone NF, May 10, 2000  |
| 11 | Dick Phillips, regional economist, Pacific Northwest Region, USFS, "Rvds and Occasions by Fiscal Year, Admin. Unit and Activity, FY-1997" provided April 2000. No RVD data available for Rogue River NF.  |
| 12 | Northern Great Plains Management Plan (NGP) DEIS (and Dakota Prairie NG website, www., April 22, 2000): Sheyenne NG--25 mi North Country National Scenic Trail; no trails noted for Grand River & Cedar River NGs (McKenzie RD); Little Missouri NG--"By 1998, the Maah Daah Hey Trail stretched more than 120 miles. Other shorter trails include the Summit (4.5 miles long), the LongX (8.5 miles long) and the Little Missouri Snowmobile (22 miles long)." |
| 13 | no trails on Grand River NG (NGP DEIS p. 3-201); no trails or trailheads mentioned in NGP DEIS for Ft. Pierre or Buffalo Gap NGs; 1998 Nebraska NF forest plan monitoring report mentions lack of developed trails on Buffalo Gap NG; assume no trails on SD portion of Custer NF.  |
| 14 | 103 mi on Nebraska NF units, all apparently in NE (NGP Mgmt. Plan DEIS p. 3-201)  |
| 15 | 0 trail miles on Thunder Basin NG (NGP Mgmt. Plan DEIS p. 3-196)  |
| 16 | 0 trail miles on Sioux RD of Custer NF (covers northwest corner of SD)  |
| 17 | front desk of BHNH confirmed 0 miles of motorized trails (not including ATV trails), May 5, 2000  |
| 18 | John Favro, Trails Coordinator, "Road Miles by Maintenance Levels, 1999," USFS Region 1 (Northern), Missoula, MT, April 4, 2000   |
| 19 | Washington State Trails Plan: Policy and Action Document, Interagency Committee for Outdoor Recreation, Tumwater, WA, June, 1991, p. 12   |
| 20 | Oregon Outdoor Recreation Plan 1994-1999, Oregon Parks and Recreation Department, December 1, 1994, p. III-12.  |
| 21 | Idaho Trails Plan 1993, Idaho State Parks and Recreation (undated), pp. 69-72   |
| 22 | Stephen F. McCool and Justin Harris, The Montana Trail Users Study, Research Report 35, Institute for Tourism and Recreation Research, School of Forestry, University of Montana, Missoula, MT, August 1994, p. 3   |
| 23 | North Dakota 1996-2000 State Comprehensive Outdoor Recreation Plan, North Dakota Parks & Recreation Department (undated), p. 39   |
| 24 | South Dakota Comprehensive Outdoor Recreation Plan, 1992, Division of Parks and Recreation, Pierre, SD, 1993, pp. 2-14 through -17  |
| 25 | A Network of Discovery, A Comprehensive Trails Plan for the State of Nebraska, prepared for Nebraska Energy Office and Nebraska Department of Economic Development, July 1994, p. 12  |
| 26 | John F. Mahoney et al., 1995 State Comprehensive Outdoor Recreation Plan, Wyoming Department of Commerce, Division of State Parks & Historic Sites (undated), p. 62   |
| 27 | Trish Clabaugh, Recreation, Bighorn NF, revised 11/24/97, provided May 11, 2000   |
| 28 | uses summer trail miles from Ref. 4, with snowmobile/xc-ski trail mileage from 1993 Idaho State Trails Plan; note that the latter are typically round numbers, indicating they are very rough estimates   |
| 29 | only Idaho miles given for snowmobile and xc-ski trails (from 1993 Idaho Trails Plan)   |

|    |   |
|----|---|
| 30 | Randy Welsh, Wilderness, Rivers, & Caves Coordinator, "State summary of total recreation use on National Forest System lands by activity--fiscal year 1996," USFS Region 4 (Intermountain), Ogden, UT   |
| 31 | Terry Dilts, Recreation Staff Officer, Nebraska NF, 1997 data for Wall, Ft. Pierre, and Pine Ridge RDs, 1994 data for Bessey RD, provided May 23, 2000. Assume RVDs for Fall River RD are negligible.   |
| 32 | Linda Merigliano, Recreation staff, Bridger-Teton NF, Jackson, WY, provided May 25, 2000  |
| 33 | Estimate formed as the proportion of all FS open roads in SD units of the Nebraska NF (Buffalo Gap and Ft. Pierre NGs make up 58% of the roads), from NGP DEIS, p. 3-224. Nebraska NF as a whole has 613 mi of low-clearance plus 175 mi of high-clearance road.                            |
| 34 | Estimate formed as the proportion of all FS open roads in NE units of the Nebraska NF (Oglala NG, Bessey RD, Pine Ridge RD, McKelvie NF together make up 42% of the roads), from NGP DEIS, p. 3-224. Nebraska NF as a whole has 613 mi of low-clearance plus 175 mi of high-clearance road. |
| 35 | Mary Sanderson, Recreation, Medicine Bow-Routt NF, Laramie, WY, 1997 RVD data provided June 2000  |
| 36 | Thad Harper, Recreation, Bighorn NF, Sheridan, WY, 1997 RVD data provided May 2000  |
| 37 | Zona MacIntyre, Computer Assistant/INFRA Coordinator, Custer NF/Dakota Praire NG, provided 1996 ranger district level RVD data, June 2000. Until 1999, Dakota Praire NG units were part of Custer NF.   |
|    |   |
|    | * WY data do not include the 96,223 acres of the Ashley NF in Wyoming   |
|    | † exceptionally high levels of ORV and pedestrian use off of system trails--mostly on beaches, so Siuslaw summer RVDs not included in totals.   |