# *Off-the-Track: America's National Parks under Siege*

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# *Off-the-Track: America's National Parks Under Siege*

**Executive Summary**

*Off-the-Track*: *America's National Parks Under Siege* provides an extensive investigation into the effects of off-road vehicle (ORV) use in the National Park System.[1] Based largely on a Bluewater Network's National Park survey, which documents damages in individual park units (see Appendix), *Off-the-Track* paints a disturbing portrait of overwhelming degradation and destruction of natural resources on our public lands – lands accorded some of the highest possible protection as mandated by the President of the United States and the US Congress.

*Off-the-Track* presents compelling evidence that lasting damage to America's Parks caused by off-road vehicle use is incompatible with the National Park Service's (NPS) mission to "leave resources unimpaired for the enjoyment of future generations." Furthermore, *Off-the-Track* predicts that existing conflicts between ORV users, other recreational activities, and wildlife will only increase in the future due to an expanding off-road vehicle marketplace.

Off-road vehicles, otherwise known as "thrillcraft," are used for recreation and amusement in over half of the 108 Park units physically large enough to accommodate them.[2] Of those, 40 parks report off-road vehicle activity is damaging park resources, in many cases, very significantly. All year long, such craft run haphazardly across pristine wetlands and marshes, creeks and streams, and over beaches, prairies, and irreplaceable wildlife corridors in park units across America. Overall, the use of thrillcraft appears to serve as high entertainment for a privileged minority of motorized "cowboys" who behave as though National Parks are their personal tramping grounds.

Unfortunately, these thrills come at a very high price to America's National Parks in the form of degraded wilderness, destroyed natural quiet, endangered wildlife, threatened visitor safety, and elevated air, water and noise pollution.

[1] The term, "off-road vehicle" commonly refers to all-terrain vehicles, four-wheel drive vehicles (jeeps, sport utility vehicles, etc.), dune buggies, sand buggies, and swamp buggies. For the purposes of this report and survey, two-wheeled vehicles (e.g. motorcycles) have not been included.

[2] Bluewater Network's survey found that 56 National Park units out of 108 surveyed currently experience ORV use. Of the remaining 150 or so park units, only several more units are physically large enough to accomodate any ORV use. Therefore, we believe our survey accounts for approximately 95% of all ORV usage in the Park System.

A synopsis is presented below in eight areas of greatest concern:

## DISTURBANCE OF WILDLIFE

ORV use threatens and harms wildlife, including endangered species such as desert tortoises, Florida panthers, piping plovers, red-cockaded woodpeckers, wood storks, bald eagles, and snail kites. Researchers have found a significant decrease in the number of species as well of the number of individuals in ORV disturbed areas. The use of off-road vehicles results in collisions with and crushing of animals and turtles, destruction of habitat, animals frightened away from shelter/important habitat, damaged hearing of wildlife, and reduces the ability of wildlife to hear sounds which are important for mating, avoiding predators, and finding prey. Furthermore, ORV use destroys food sources and habitat, resulting in population decreases.

## IMPAIRMENT OF AIR AND WATER QUALITY

Park units which allow all-terrain vehicle use (whether street legal or non-street legal) should be concerned about air quality. Nineteen percent of all-terrain vehicles are equipped with two-stroke engines, which dump up to 30% of their fuel unburned into the environment. The California Air Resources Board has found that two-stroke and four-stroke all-terrain vehicles and motorcycles release 118 times as much smog-forming pollutants into the air as do modern cars.

ORV use degrades water quality. Vehicles with two-stroke engines that enter waterways dump up to 30% of their fuel unburned into the water. Furthermore, ORV which travel along, across, or through creeks, rivers, streams and other waterways create turbidity, harm vegetation, destroy habitat for aquatic species and species which use water resources, and cause increased sedimentation and soil erosion. The increased sedimentation and soil erosion may result in impairment of water quality.

## NOISE POLLUTION

The natural quiet of our National Parks is destroyed by the use of all-terrain vehicles. Even with mufflers, the decibel level ranges from 81-110 dB. The sound of a forest has been measured at 15 dB. Excessive noise harms wildlife and disturbs park visitors.

## CONFLICTS WITH OTHER USERS

Off-road vehicle use is incompatible with the serenity, natural landscape, and wildlife that many visit the parks to experience. ORV use disturbs hikers, backpackers, wildlife observers, and those who visit to enjoy the scenery and peace and quiet. ORV use also creates conflicts with hunters on foot by scaring away the prey and destroying the nature experience.

## DAMAGE TO CULTURAL RESOURCES

Cultural resources such as archeological artifacts and sacred sites are valuable pieces of our National Parks. Off-road vehicles drive across some archeological areas with abandon, sometimes destroying or crushing objects of value. Off-road trails provide increased access to remote areas, resulting in further degradation of cultural artifacts and sites. In Bluewater Network's survey, five National Monuments, Historic Sites, and Historic Parks experienced illegal use resulting in damage of park resources.

**SAFETY**

All-terrain vehicles are unsafe. In 1997, there were an estimated 54,500 ATV-related injuries. According to the Consumer Product Safety Commission these vehicles have a very high tendency of turning over, pinning or crushing the rider.

**SOIL EROSION:**

Off-road vehicle use has serious and long-lasting impacts on the soil, a critical component of most ecosystems. Direct impacts include the disruption of the soil surface/destruction of soil stabilizers, destruction of organisms within the soil surface and compaction of soil. Indirectly, off-road vehicles cause acceleration in the rates of wind and water erosion. Soils damaged by ORV use may take centuries to heal.

**DESTRUCTION OF VEGETATION:**

Off-road vehicle use destroys vegetation, both directly and indirectly. Adult plants and seedlings are harmed and destroyed as off-road vehicles drive over them. Weeds and invasive exotic species are spread and take the place of native and rare species, changing the vegetative landscape of the parks. Due to the loss of vegetation, areas surrounding the impacted area also experience a decrease in vegetation.

**Conclusion**

The Organic Act mandates that the mission of the Park Service is to leave its resources "unimpaired for the enjoyment of future generations." ORVs have created significant environmental impairments to National Park units already. Without a complete prohibition on ORV use, such problems will continue to grow at a pace commensurate with increased ORV sales.

In a separate petition attached to this report, dated December 7, 1999, Bluewater Network is requesting an immediate ban on the use of all-terrain vehicles, dune buggies, sand buggies, and four-wheel drive vehicles on all off-road areas in the National Park System including all beach areas, non-maintained or primitive roads and trails, and high-clearance or backcountry roads. The limited exceptions to this requested ban include: subsistence use by indigenous people in Alaska, traditional use or hunting use as defined in enabling legislation, administrative and law enforcement activities of Park personnel, access to private in-holdings, and essential services (i.e. search and rescue) at Park facilities.[3]

Bluewater has requested the immediate adoption of the following definition of "off-road vehicle usage," which is currently employed by the US Forest Service and Bureau of Land Management:

> … any riding that is not on pavement or on a high-standard gravel road. Riding the primitive roads and trails on public lands is often referred to as "off-road."[4]

[3] Limited exemptions may be appropriate also for county-owned roads in park areas, defined under RS 2477.

[4] U.S. Department of the Interior and U.S. Department of Agriculture. *Summary of the Off-highway Vehicle Environmental Impact Statement and Plan Amendment for Montana, North Dakota, and Portions of South*

Furthermore, Bluewater Network conducted a 1999 survey of off-road vehicle use in the parks that found 40 park units which had high amounts of illegal use. Therefore, Bluewater Network has also requested that the National Park Service immediately issue an advisory to increase the enforcement of present rules, as well as promulgating other methods of preventing unlawful use.

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*Dakota*. Bureau of Land Management Montana State Office and Forest Service. Northern Region. Draft. October 1999. [*hereinafter* BLM and Forest Service 1999)

## I. BLUEWATER NETWORK SELECTED SURVEY OF ATV AND OFF-ROAD VEHICLE USE

From July to November of 1999, Bluewater Network conducted a survey of all-terrain vehicle (ATV) and other off-road vehicle use in National Park units.

The survey was first mailed out in the form of a questionnaire. After the responses from the first survey were received, a follow-up telephone survey with those parks was completed.

The survey was issued to 108 National Park Units. Specifically, it was issued to all National Parks, Preserves, National Recreation Areas, Seashores and Lakeshores, as well as to larger National Monuments and Historic Sites. Sixty-nine Park units responded to the survey. Of the parks that did not respond, Bluewater Network researched the Park's website for further information, and followed up with phonecalls to park staff.

The following findings are from the survey conducted of the Park units. The report (sections II-VIII) covers the damage to soil, vegetation, air and water quality, and wildlife as well as the conflicts with other users, and threat to public safety documented in scientific literature and reports.

### SURVEY FINDINGS

- Off-road recreational vehicles (excluding motorcycles) are being used in more than half of all possible park units, or a total of 56 units (52%).
- The creation of long-lasting tire tracks, damage to vegetation, and disturbance and harm to endangered wildlife is occurring in 38 parks, representing a third (34%) of the total.
- Widespread destruction of valuable topsoil, soil crusts, and increases in erosion.
- Numerous visitor complaints regarding four-wheel tire tracks, noise, destruction of resources, and disturbance of other types of recreation.
- Over 30,434 miles of four-wheel drive roads are legally open to off-road vehicles.
- Rangers at Lake Mead National Recreation Area (TX) have found desert tortoises (an endangered species) which have been run over by ORVs.
- Historic artifacts from the Gold Rush have been broken or crushed at Klondike Gold Rush National Historical Park

### 1. Concerns of park rangers*:*

Wildlife:

- Crushing of desert tortoises
- Damage to nesting birds and turtles
- Harassment of marine mammal, seals, sea lions, and shorebirds
- Noise disturbances for all species
- Disruptions of food gathering, migration, and/or bioenergetics for elk, deer, bear, coyotes, wolves, rabbits

Soil:

- Destruction of protective crusts
- Creation of ditches and gullies by tire tracks
- Severe soil erosion
- Destruction of dunes
- Destruction of wetlands
- Pioneered trails
- Damage to cryptobiotic soils
- Destruction of alpine landscape

Vegetation:

- Loss of seed banks
- Long-lasting tire tracks
- Uprooting of plants
- Disturbance of Vegetation

Water Quality:

- Extensive damage to/destruction of stream beds
- Change the hydrology of mudflats

Visitor Experience:

- Noise disturbance

Cultural Resources:

- Destruction of cultural artifacts

**2. Parks are Damaged by ORVs**

According to survey responses, numerous rangers and other park staff believe the use of all-terrain vehicles, four-wheel drive vehicles, swamp buggies, sand buggies, and dune buggies is impairing the following parks. Park units are experiencing damage to soil, vegetation, and wildlife.

**Category 1: Parks with current legal use (beach access, backcountry roads, etc.):**

Twenty-three park units permit use of off-road vehicles.

Eighteen parks permit use on park beaches or in off-road areas ("backcountry," high clearance roads). They are:

- Big Bend National Park (TX)
- Big Cypress National Preserve (FL)
- Canyon de Chelly National Monument (AZ)
- Canyonlands National Park (UT)
- Cape Cod National Seashore (MA)
- Cape Hatteras National Seashore (NC)
- Cape Lookout National Seashore (NC)
- Capitol Reef National Park (UT)
- Death Valley National Park (CA)
- Dinosaur National monument (CO)
- Fire Island National Seashore (NY)
- Glen Canyon National Recreation Area (AZ)
- Great Smoky Mountains National Park (TN)
- Joshua Tree National Park (CA)
- Lake Mead National Recreation Area (NV)
- Lake Meredith National Recreation Area (TX)
- Little River Canyon National Preserve (AL)
- Mojave National Preserve (CA)

Five park units allow use as a result of their specific enabling or other legislation.

- Assateague Island National Seashore (VA)
- Glacier Bay National Park and Preserve (AK)
- Kenai Fords National Park (AK)
- Denali National Park and Preserve (AK)
- Bering Land and Bridge National Preserve (AK)

Together, this represents a total of over 30,434 miles of four-wheel drive roads open to off-road vehicles. The actual area impacted is much larger, as damage from roads and vehicle traffic extend beyond the actual use areas.

**Category 2 (a): Parks with illegal ORV use**

Nineteen parks experience extensive illegal use. An asterisk (*) indicates that the park is simultaneously listed in two categories – in other words, rangers report that these parks have both legal and illegal use.

- Aniakchak National Monument and Preserve (AK)
- Bighorn Canyon National Recreation Area (MT and UT)
- Cape Cod National Seashore (MA)*
- Cape Hatteras National Seashore (NC)*
- Capitol Reef National Park (UT)*
- Crater Lake National Park (OR)
- Delaware Watergap National Recreation Area (PA)
- Everglades National Park (FL)
- Great Basin National Park (NV)
- Gulf Islands National Seashore (FL)
- Hopewell Culture National Historical Park (OH)
- Indiana Dunes National Lakeshore (IN)
- Klondike Gold Rush National Historical Park (AK)
- Lake Mead National Recreation Area (NV)*
- Mammoth Cave National Park (KY)
- Mojave National Preserve (CA)*
- Padre Island National Seashore (TX)
- Saguaro National Park (TX)
- Sunset Crater National Monument (NM)

**Category 2 (b): Parks with smaller amounts of illegal use:**

Twenty-one parks experience some illegal use.

- Apostle Islands National Lakeshore (WI)
- Big Thicket National Park (TX)
- Canyonlands National Park (UT)*
- Cape Lookout (NC)*
- Cedar Breaks National Monument (UT)
- City of Rocks National Recreation Area (ID)
- Cumberland Island National Seashore (GA)
- Curecanti National Recreation Area (CO)

- El Malpais National Monument (NM)
- Glacier Bay National Park (AK)
- Grand Canyon National Park (AZ)
- Grand Teton National Park (WY)
- Great Sand Dunes National Monument (CO)
- Hawaii Volcanoes National Park (HI)
- Lake Roosevelt National Recreation Area (WA)
- Petrified Forest National Park (AZ)
- Petroglyph National Monument (NM)
- Pictured Rocks National Lakeshore (MI)
- Redwood National Park (CA)
- Voyageurs National Park (MN)
- Yellowstone National Park (WY)

## II. THE AUTHORITY OF THE NATIONAL PARK SERVICE TO PROHIBIT OFF-ROAD VEHICLE USE

The National Park Service (NPS) often faces criticism from both those who believe the NPS should provide greater protection for park resources, and from those who believe the NPS has already exceeded its authority.[5] Court decisions have consistently upheld the need for protection of park resources as well as the NPS statutory duty to protect them. These cases clearly demonstrate that the NPS has the statutory authority to adopt any regulations which best achieve the 1916 Organic Act's mandate to leave park resources "unimpaired" for future generations –including the prohibition of off-road vehicles.

### A. Statutory Authority

In 1872, Congress created Yellowstone National Park as a "pleasing ground" for the American people. From 1872 to 1916, while Congress continued to add new park units such as Yosemite, Kings Canyon and Glacier National Parks, the necessary coordination and consistency of management between the different units did not exist.[6]

Responding to public calls for better park management in 1916, Congress passed the Organic Act and created the National Park Service. At the core of the Organic Act, the National Park Service is charged with:

> [Conserving] the scenery and the natural and historic objects and the wildlife therein, and to provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations.[7]

In the years following World War II, the National Park System experienced phenomenal growth both in numbers and in variety of its units. By 1970, Congress formally recognized the development the National Park System by passing the Park Service General Authorities Act. In this Act Congress declared that:

> These areas [the national park units], . . . are united through their interrelated purposes and resources into one National Park System as cumulative the expression of a single national heritage ... and that it is the purpose of this Act to include all such areas in the system and to clarify the authorities applicable to the system.[8]

With this Act, Congress designated the NPS as the authority responsible for managing park resources with a coordinated, consistently applied approach. Congress also stressed that regardless of whether a park unit is a National Park, a National Battlefield, or a National Recreation Area, all park units are to be afforded the same level of protection. No unit is of a greater or lesser importance than any other unit**.**

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[5] John Donaldson, "National Park Service Has Gone Too Far," (http://www.pwia.org.Hot_NPS.htm.) 1998.
[6] Dyan Zaslowsky, *These American Lands.* (New York: Henry Holt and Company, 1986).
[7] 16 U.S.C. § 1.
[8] 16 U.S.C. § 1a –1.

The NPS' authority to regulate recreation and manage the public resources of the system is also clarified by the General Authorities Act. In particular, it grants the Secretary of the Interior the ability to authorize certain activities. However, the Secretary's power is not unlimited. The Secretary may not permit activities which result in the "derogation of the values and purposes for which these various [parks] have been established, except as may have been or shall be directly and specifically provided by Congress."[9]

In 1978, with the passage of the Redwoods Act, Congress provided guidance to the NPS as to what activities are appropriate for the Park System. In this Act, Congress stated that:

> The authorization of activities shall be construed and the protection, management and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress.[10]

**B. NPS Management Policies: Appropriate Forms Of Recreation**

Guided by the Acts outlined above, the Park Service has developed management policies delineating what types of recreation are appropriate for the Park System. Specifically, an appropriate form of recreation is defined as one that is "essentially resource based but nonconsumptive of resources."[11] Clearly, consumptive uses of park resources, whether renewable or nonrenewable, are allowed only where specifically authorized by federal law or treaty rights.[12]

NPS management policies also require the Park Service to encourage visitors to pursue inspirational, educational and recreational activities related to park resources. However, the Park Service recognizes that it has a legal obligation to manage those activities, and whenever necessary, regulate the type, time, and place of the activity. Park Superintendents may even prohibit a specific activity under Title 36 of the Code of Federal Regulations if it is his/her determination that the occurrence, continuation, or expansion would result in the derogation of the values or purposes for which the park was established, or interfere significantly with other park visitors' enjoyment.[13]

According to the 1988 NPS Management Policies, unless an activity is mandated by statute, the NPS will not allow a recreational activity in a park or in certain locations within a park if it would involve or result in:

1. Inconsistency with the park's enabling legislation or proclamation, or derogation of the values or purposes for which the park was established.
2. Unacceptable impacts on visitor enjoyment due to interference or conflict with other visitor use activities.
3. Consumptive use of park resources.
4. Unacceptable impacts on park resources or natural processes.

[9] 16 U.S.C. § 1a –2 (h).
[10] 16 U.S.C. § 1a –1.
[11] National Park Service. "Management Policies." US Department of the Interior, 1988. [*hereinafter* NPS 1988]
[12] NPS 1988
[13] 36 CFR. 1.5.

5. Unacceptable levels of danger to the welfare or safety of the public, including participants.[14]

## C. Other Relevant Statutes Giving the NPS Authority to Prohibit Off-Road Vehicles

The management of recreational activities within the National Park System is also governed by a number of environmental laws. Following are some of the most relevant with regards to off-road vehicles:

Clean Air Act

The Clean Air Act (CAA) is the comprehensive federal law that regulates air emissions from all stationary and mobile sources such as four-wheel off-road vehicles (ORV). This law authorizes the U.S. Environmental Protection Agency to establish National Ambient Air Quality Standards (NAAQS) to protect public health and the environment. The 1977 amendments to the CAA were designed to limit the amount of additional air pollution affecting National Parks and wilderness areas and to prevent further deterioration of the air quality of these special places.[15]

In National Park units which allow all-terrain vehicles, dune buggies, sand buggies, and swamp buggies., air quality is being significantly degraded. According to the Environmental Protection Agency, 19% of all-terrain vehicles are equipped with two-stroke engines. Two-stroke engines dump approximately 30% of their fuel, a mixture of gas and oil, unburned into the environment. According to data from the Environmental Protection Agency, two and four-stroke all-terrain vehicles emit 4,000 times more carbon monoxide than do modern automobiles. Dune buggies, sand buggies, and swamp buggies are also equipped with the same engines and create similar amounts of pollution.

The Endangered Species Act

The goal of the Endangered Species Act (ESA) is to halt human-caused species extinction in the United States. In particular, it prohibits the killing or harassing of wildlife listed or proposed for protection. The Park Service's most recent data reveals that 120 endangered or threatened species are known or suspected to be at risk within the National Park System. As a result, ORV may be regulated under Section 7 of the ESA, which provides federal agencies the authority to prohibit activities that are perceived as having adverse impacts on both listed and proposed species, until such time as studies determine otherwise.[16]

Often, National Park units provide critical habitat for endangered and threatened species. These mammals, birds, reptiles and plants are quite sensitive to human disturbances such as ORV activity. The desert tortoise, for example, was once common throughout the Southwest. Today, due in large part to human disturbances such as ORV use, desert tortoise populations have declined by 90%.[17] Rangers at Lake Mead National Recreation Area have found desert tortoises which were run over by ORVs.

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[14] NPS 1988.
[15] 42 U.S.C. § 740.
[16] 16 U.S.C. § 1531.
[17] Fish and Wildlife Service. "Placing a Bet on the Desert Tortoise." US Department of the Interior,

Cape Cod National Seashore is home to the endangered piping plover. Since this bird is a ground nester, ORV activity may threaten not just the nests but also the eggs and chicks within.[18]

ORV activity may also damage endangered plants. Big Bend National Park, for example, contains the only known populations of the Chisos Mountain Hedgehog Cactus. ORV use in this park may threaten this cactus, since the activity often spreads exotic species. These weeds compete and push out native species, such as the Chisos Cactus.

Big Cypress National Preserve is an important habitat for the Florida Panther. ORV use destroys its habitat as well as increases the number of prey available through providing additional access for motorized hunters. [19]

The following park units currently experience ORV activity, and the number of endangered or threatened species contained within those units is listed: [20]

| **Park** | **Number of Endangered/Threatened Species** |
|---|---|
| Assateague | 1 |
| Big Bend | 6 |
| Big Cypress | 18 |
| Big Thicket | 5 |
| Bighorn Canyon | 11 |
| Canyonlands | 5 |
| Cape Cod | 2 |
| Cape Hatteras | 3 |
| Cape Lookout | 3 |
| Capitol Reef | 5 |
| Crater Lake | 2 |
| Cumberland Island | 9 |
| Death Valley | 1 |
| Delaware Water Gap | 1 |
| Everglades | 14 |
| Fire Island | 1 |
| Glen Canyon | 7 |
| Grand Teton | 4 |
| Great Basin | 1 |
| Gulf Islands | 10 |
| Indiana Dunes | 5 |
| Lake Mead | 4 |
| Padre Island | 6 |
| Pictured Rocks | 4 |
| Redwood | 2 |
| Saguaro | 3 |
| Voyageurs | 4 |

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http://www.rl.fws.gov/text/turtle/html. 1998.

[18] National Park Service, http://www.nps.gov., US Department of the Interior, 1998.

[19] U.S. Department of the Interior. National Park Service. *Draft Recreational Off-Road Vehicle Management Plan: supplemental environmental impact statement*. Big Cypresss National Preserve. September 1999.[*hereinafter* Big Cypress 1999]

[20] National Park Service. "Endangered Species in the National Parks." US Department of the Interior, 1998.

Marine Mammal Protection Act

The Marine Mammal Protection Act (MNNA) provides the NPS additional statutory authority to limit ORV use in National Park units. This Act establishes a moratorium, with certain exceptions, on the taking of marine mammals in US waters, and on the importing of marine mammals and their products into the United States. The MMPA gives the NPS the authority to regulate ORV because it defines the term "take" to mean "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture or kill any marine mammal." Under the 1994 amendments to the NMMA, Congress defined the term "harassment" to mean any act of pursuit, torment, or annoyance which:

> 1. has the potential to injure a marine mammal or marine mammal stock in the wild (Level A Harassment);
> 2. has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B Harassment).[21]

Rangers at Redwood National Park state that ORV have been used to harass marine mammals, such as seals, and sea lions.

National Environmental Policy Act

The National Environmental Policy Act (NEPA) requires federal agencies to use a systematic, interdisciplinary planning approach to determine if a proposed federal action will have a significant impact on the environment. [22] In 1994, the Park Service at Canyonlands National Park prepared an Environmental Assessment (EA) which analyzed and evaluated the impacts of Backcountry visitor use, including ORV. [23] Park units that have not completed similar investigations of ORV impacts upon park resources are clearly in violation of NEPA requirements. Bluewater believes such Environmental Assessments have not been conducted in many park units.

Archaeological Resources Protection Act, 1979

Use of ORV is also limited by the Archaeological Resource Protection Act (ARPA). Specifically ARPA mandates that the NPS must prevent people from damaging, or otherwise altering or defacing any archaeological resources contained on public land. Many parks report concern with illegal ORV use that damages archaeological resources. Park personnel at Klondike Gold Rush National Historical Park, for example, confirm that historic objects have been crushed and destroyed by ATVs. These rangers also believe that ATV riders have removed some objects.[24]

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[21] 16 U.S.C. § 1361.
[22] 42 U.S.C. § 4321.
[23] National Park Service, Final 1994 Canyonlands National Park and Orange Cliffs Unit of Glen Canyon National Recreation Area Backcountry Management Plan, November 30, 1994.
[24] 16 U.S.C. Chapter 1B Sec. 470ee

**D. Executive Orders**

In addition to legislative requirements, ORV activity on federal public lands must also meet Presidential directives. Issued by President Richard Nixon in 1972, Executive Order 11644 requires the Secretary of the Interior to issue regulations and administrative instructions to the agencies under his/her management that spell out which areas of Department of Interior lands are open to off-road vehicles. The order requires that decisions to open an area to ORV use must be based upon the protection of resources, minimization of conflicts among various users, promotion of the safety of all users of public lands, and the minimization of disruption of wildlife and their habitat. EO 1644 limits ORV authorization in National Park System until it has been determined that ORV use will not adversely impact the units' natural, aesthetic, or scenic values.[25]

In May of 1977, President Jimmy Carter amended EO 11644 with Executive Order 11989. This order requires the Secretary of the Interior to close areas to ORV if it is determined that use will cause or is causing considerable adverse effects on the soil, vegetation, wildlife and habitat, or cultural and historic objects. Those areas are to remain closed until such a time as the Secretary determines that such adverse effects have been eliminated and that measures have been implemented to prevent future recurrence.

**E. Case Law supporting a prohibition of ORV.**

There can be no legitimate dispute that the Park Service has a statutory mandate to adopt rules which "best achieve the Organic Act's mandate," including rules to prohibit ORV if the activity adversely affects park resources. National Wildlife Fed. v. National Park Service.[26] In fact, a long line of case law has made it clear that the Park Service must regulate public use of the parks in order to promote preservation objectives. See, e.g., Michigan United Conservation Clubs v. Lujan, [27] Mausolf v. Babbitt, [28] Organized Fisherman of Florida v. Hodel, [29] National Rifle Association (NRA) v. Potter, [30] Southern Utah Wilderness Alliance v. Dabney. [31]

As Congress has explained, "[t]he Secretary of the Interior has an absolute duty, which is not to be compromised, to fulfill the mandate of the [Organic] Act to take whatever actions and seek whatever relief as will safeguard the units of the National Park System."[32] Thus, for example, in Potter, the Park Service concluded that its long-standing authorization of hunting was inconsistent with the Service's preservation mandate, and prohibited hunting in the parks unless Congress required it. The National Rifle Association (NRA) challenged this regulatory shift, arguing that each park should be permitted to determine whether to permit hunting. The Park Service in turn argued that its philosophy "has always been exclusively protectionist," and that the amendments to the Organic Act were a "point[ed] remind[er]" to the Park Service to pursue that mission." The court agreed, finding that the Park Service's emphasis on preservation was entirely appropriate and consistent with Congressional intent. "Notwithstanding that the goals of user enjoyment and natural preservation may sometimes conflict, the Park Service may rationally conclude, in light of

[25] Richard Nixon, Executive Order 11644, February 8, 1972
[26] 669 F. Supp. 384, 391 (D. Wyo. 1987)
[27] 949 F.2d 202 (6th Cir. 1991)
[28] 125 F.3d 661 (8th Cir. 1997)
[29] 775 F.2d 1544 (11th Cir. 1985)
[30] 628 F. Supp. 903 (D.D.C. 1986)
[31] 7 F. Supp. 2d 1205 (D. Utah 1998)
[32] Senate Rep. No. 528, 95th Cong. 1st Sess. 21 (1977)

the Organic Act and its amendments, that its primary management function . . . is preservation unless Congress has declared otherwise."

**F. The Park Service has the Authority to Prohibit Off-road Vehicles; and such a Prohibition would be consistent with the Agency's mandate, this Administration's Announced Approach to Park Protection, and the Will of the American People**.

Given the documented adverse impacts of ORV, a prohibition on such use in the National Parks would be entirely consistent with the Park Service's preservation mandate. Just as the Park Service prohibited hunting in order to comply with Congress' intent that these areas be protected, so must the Park Service prohibit ORV in order to preserve the Parks and continue to fulfill its responsibilities under the Organic Act.

Indeed, the first step has already been taken at Canyonlands National Park, and thereby demonstrated the appropriateness, necessity and legality of such restrictions. See Southern Utah Wilderness Alliance v. Dabney (SUWA). In SUWA, the Utah District Court found the Park Service to be in violation of the Organic Act for its failure to prevent off-road vehicles, such as jeeps, from causing lasting damage to park resources. Furthermore, it rejected the argument that the Organic Act permits enjoyment of motorized thrill-craft by stating that visitor enjoyment as employed in the Organic Act refers "to enjoyment of park scenery and wildlife, and not to visitor enjoyment of outdoor recreational activities.[33]

The Park Service does not have to wait until lasting damage occurs and further court cases are decided before upholding its authority to engage in proactive management of motorized recreation.[34] In Mausolf v. Babbitt, snowmobiling interests sued the Park Service for limiting the areas in the park available to snowmobiles. Although Voyageurs has specific authorizing legislation concerning snowmobiles,[35] the Court of Appeals for the Eighth Circuit upheld limitations it enacted, explaining that the agency "enjoys broad discretion in carrying out the mandates of its governing statutes." In addition, the Court explained that the Park Service's actions support "specific regulatory objectives such as protection of environmental or scenic values' [and] 'protection of natural or cultural resources.[36] A nationwide prohibition on all ORV in the parks would also be fully justified under the Park Service's governing executive orders. [37]

Moreover, given the adverse impacts of ORV, only by prohibiting these activities can the Park Service adhere to its guiding statutes and regulations. Indeed, the agency has recognized that "the management and administration of park areas must be in accordance with both the general laws relating to the National Park System and the more specific laws relating to the authorization and administration of a particular park unit."[38]

As previously stated, 1988 NPS management policies also support a ban on ORV use in National Parks.[39] This policy prohibits activities which "would involve or result in inconsistency with the

[33] 7 F. Supp. 2d 1205 (D. Utah 1998)
[34] 125 F.3d 661, 667 (8th Cir. 1997)
[35] 16 U.S.C. § 160h
[36] 125 F.3d 661, 667 (8th Cir. 1997)
[37] 18F 3d 1468 (9th Cir. 1994)
[38] 48 Fed. Reg. 30252 (June 30, 1983)
[39] Park policy "originates in law" and is "based on the Constitution, public laws, proclamations, executive orders, rules and regulations, and directives..." (USDI 1988). Adherence to Park Service policies is "mandated" unless "waived or modified by an appropriate authority." Id.

park's enabling legislation...derogation of the values or purposes for which the park was established ... (or) unacceptable impacts on park resources or natural processes ..." An impact is deemed "unacceptable" if it will impair "physical resources, such as wildlife and geologic features, and intangible values, such as scenic vistas and solitude." Moreover, Park Service regulations prohibit ORV if such use will "disturb wildlife or damage park resources." [40] As documented earlier, ORV use in National Parks clearly meets and, indeed, exceeds these criteria, thus mandating that the Park Service either "mitigate the impacts" or "eliminate the activity."[41]

Prohibiting ORV use would also be entirely consistent with the approach that federal agencies have taken in recent years to handle similar problems in the National Parks. For example, the Departments of Interior and Transportation recently announced plans to curtail the degradation caused by too many cars in certain National Parks. In particular, they announced that, in order to "preserve and protect" the Grand Canyon "for future generations," the federal government will "greatly restrict automobile use," as well as diesel buses, diesel and steam locomotives and outboard engines on river rafts.[42] Similarly, the government has recently taken action to curtail air traffic over Grand Canyon, recognizing that permitting these flights conflicts with the Park Service's duty to "preserve the natural environment."[43] All the reasons that support these regulatory initiatives -- air and water pollution prevention, noise abatement, wildlife protection, conflicts with other users, public safety -- fully apply to ORV use.

Finally, in addition to repeated indications from Congress, the Courts, and from the Park Service itself that the preservation mandate should be the NPS' highest priority, the American people themselves have recently made it clear that the preservation of our National Parks must continue to be the paramount management objective of the Park Service. In a recent survey by the National Parks and Conservation Association, Americans rated the preservation of the National Parks' air and water quality, wildlife habitat, and natural ecosystems as immensely more important than utilization of the parks for recreation and tourism.[44] Moreover, almost seventy percent of those surveyed believe the parks should be managed for future generations rather than present use.

In summary, prohibiting ORV would be consistent with the long-standing mission of the Park Service, recent initiatives of the Administration, and the will of the American people.

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[40] 36 C.F.R. §2.18(c)
[41] Executive Orders 11644 and 11989
[42] 61 Fed. Reg. 69,308 (Dec. 31, 1996)
[43] See 62 Fed. Reg. 1795, 1796 (Jan. 13, 1997)
[44] DeRuiter ,Darla S. and Glenn E. Haas. National Public Opinion Survey on the National Park System,: Executive Summary Report 1998.

## III. OFF-ROAD VEHICLES: DEFINITION, DESIGN, AND MARKETING

### A. Definitions

*Off-road vehicle*

Off-road or off-highway vehicles (ORV, OHV) are motorized vehicles designed to travel over any type of terrain. The vehicles can be street legal, such as jeeps or sport utility vehicles, or not-street legal, such as the majority all-terrain vehicles.[45] Although dirt bikes are used off-road, and their impacts examined and considered, for the purposes of this report the term off-road vehicle (ORV) is used to refer to vehicles with three or more tires capable of traveling over any type of terrain.

*Off-road, Off-Highway travel*

The National Park Service currently has no definition for off-road or off-highway travel. According to the Bureau of Land Management and Forest Service, off-road and off-highway means:

> … any riding that is not on pavement or on a high-standard gravel road. Riding the primitive roads and trails on public lands is often referred to as "off-road."[46]

Bluewater Network urges the Park Service to adopt the above definition of off-road travel.

*ATVs, including dune buggies, sand buggies, and swamp buggies*

All-terrain vehicles (ATVs) are a category of off-road or off-highway vehicles (ORVs or OHVs). The definition of all-terrain vehicles varies throughout the US, but the majority of the agencies use factors such as weight, use by a single operator, and straddling of the seat by an operator to define the craft. In this report, dune and sand buggies are considered as a type of all-terrain vehicle.

The National Park Service does not have a definition of all-terrain vehicle in the Code of Federal Regulations, although the off-road use of vehicles is prohibited except for designated routes.[47]

Over the past fifteen years, there have been many changes in off-road use. This category, formerly consisting mostly of dirt bikes and dune buggies, is now considered to include all-terrain vehicles, swamp buggies, sand buggies, four-wheel drive vehicles, jeeps, and sport utility vehicles. These vehicles are increasing in size, as well as in their ability to travel across inhospitable or difficult terrain. Due to the changing dynamics of off-road recreational vehicles, Bluewater Network believes that there is a need to specifically define and regulate the various types of ORVs.

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[45] In some states, all-terraain vehicle owners may alter their vehicle to make it street legal. The required alterations vary, but include addition of seat belts and mirrors, removing mufflers, or adding performance-enhancing equipment.

[46] U.S. Department of the Interior and U.S. Department of Agriculture. *Summary of the Off-highway Vehicle Environmental Impact Statement and Plan Amendment for Montana, North Dakota, and Portions of South Dakota*. Bureau of Land Management Montana State Office and Forest Service. Northern Region. Draft. October 1999. [*hereinafter* BLM and Forest Service 1999)

[47] 36 CFR § 4.10

Bluewater Network urges the Park Service to institute the following definition for all-terrain vehicles:

> **The term "all-terrain vehicles" (ATVs) refers to motorized vehicles with three or more low-pressure tires designed for use in off-road areas.**

**Four-wheel drive vehicles**

Four-wheel drive vehicles are a category of automobile. They are high-clearance automobiles equipped with four-wheel drive (most often referred to as often jeeps, trucks, or sport utility vehicles) designed for on-road and off-road use.

Throughout this report, the term off-road vehicle (ORV) will refer to the above vehicles, and will not include two-wheel off-road vehicles.

**B. Design and Marketing**

**ATVs**

All-terrain vehicles are engineered to deal with various off-road trail conditions – hills, boulders, streambeds, etc. Some ATVs can reach speeds of 60 mph on flat, smooth trails.[48] However, ATVs are most often rated by their engine size in order to evaluate their ability to get through mud, over boulders, up hills or steep dunes, and climb over large logs or other obstacles.

ATVs are produced by the manufacturers of personal watercraft and snowmobiles – Honda, Bombardier, Polaris, Suzuki, Yamaha, and Arctic Cat. ATVs currently represent the largest sales segment of the motorized recreation market. Annual sales of ATVs doubled between 1991 and 1996, from 150,000 to 300,000 units.[49] There are an estimated 5.85 million drivers who own approximately 3.91 million ATVs in the US.[50]

According to the Environmental Protection Agency (EPA), 19% of ATVs have two-stroke engines.[51] Two-stroke engines run on a mixture of gas and oil and discharge 30% of their fuel unburned into the environment.[52]

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[48] "Polaris Sport 400 vs. Yamaha Banshee 350 vs. Honda 400EX." *Dirt Wheel*s. July 1999.
[49] "ATV's Surge to an Estimated 327,000 units." Dealernews. 1997. www.atving.com/editor/general/31297a.htm March 12, 1998, as quoted in Friends of the Earth and Wildlands Center for Preventing Roads. *Trails of Destruction*. 1998.
[50] U.S. Consumer Product Safety Commission. *All-terrain Vehicle Exposure, Injury, Death, and Risk Studies*. April 1998. [*hereinafter* CPSC 1998]
[51] Environmental Protection Agency. "Control of Emissions from New Nonroad Spark-ignition Engines Rated Above 19 Kilowatts and New land-Based Recreational Spark-ignition Engines".64 FR No.25, Monday February 8, 1999.
[52] Margolis, Donald L. and Mukesh Saxena. "A Study of Fuel Economy in Small, Piston Ported Two-stroke Engines." *SAE Technical Paper Series* no. 910294. International Congress and Exposition. Detroit, Michigan. February 23-27, 1981.
Kollman, R. E., S. S. Lestz, and W. E. Meyer. *Exhaust Emission Characteristics of a Small 2-Stroke Cycle Spark Ignition Engine*. Society of Automotive Engineers. International Automotive Engineering Congress. Detroit, Michigan. No. 730159. January 8-12, 1973.

Early ATVs were designed with the expectation that the soft tires would act in place of a suspension system. Filled with up to four pounds of air pressure, tires were designed to roll over bumps and depressions. However, this design also created a rebounding effect that increased with slower speeds while traveling over bumps or depressions, making it necessary for the rider to remain at the same speed while approaching obstacles, instead of slowing down.[53] Current ATVs use both knobby tires and a suspension system.

Although the retail sale of new three-wheeled ATVs was banned in 1988, one out of every five ATVs currently in use is three-wheeled.[54] Designed with three knobby tires, a narrow wheelbase and the rider balanced over the top, three-wheeled ATVs are highly unstable and dangerous.[55]

Four-wheel ATVs are similar in design, with knobby tires, large width, rear wheel steering, high ground clearance and the operator seat in the center. While four-wheel ATVs are steadier than three-wheeled ATVs, they have still been found to be highly unstable.[56] ATVs are designed with several gears and large engines which enable the driver to climb streambeds and hills.

Recent trends have included designing faster four-wheel ATVs with a lower center of gravity for increased stability, and waterproof ATVs equipped with snorkels for the intake manifold, so that the machine can travel through streambeds, mud, and deep water. (*see examples of new models*).

The use of varied tire treads is essential to the design and operation of both three and four-wheeled ATVs (*see tire examples*). ATV operators choose their tires to match terrain. Tires are designed to dig into the soil and provide traction. The design varies between smooth with one or more large grooves and smooth with many big grooves or knobs, as well as from rather narrow to very wide.

**Four-wheel drive vehicles**

Four-wheel drive vehicles are much heavier than dune buggies and ATVs. Along with their use for recreation, they are often used for practical purposes. When used for recreation, they are often outfitted with larger tires with varying treads. The large tires enable the vehicle to travel over a variety of soils, as well as increasing ground clearance, thereby enabling the operator to travel over large obstacles.

[53] Ford, Gary T., and Michael B. Mazis. "Informing Buyers of Risks: analysis of the marketing and regulation of all terrain vehicles." *Journal of Consumer Affairs*. V. 30, N. 1. 1990. [*hereinafter* Ford 1990]
[54] CPSC 1998
[55] Ford 1990
[56] "ATV Accidents." Ryan Engineering (http://www.ryan-engineering.com/Expert_Witness/atv/index.htm). Wednesday, November 10. 1999.

## IV. ADVERSE IMPACTS OF ORV USE ON THE ENVIRONMENT

### A. Impacts on soil

Studies from the U.S. Geological Survey, U.S. Fish and Wildlife Service, National Biological Service and others have demonstrated that ORVs have many impacts on soil, a critical component of all ecosystems.[57] Soil hosts small organisms, retains water to sustain plants, creates spaces and holds nutrients for the germination and sprouting of seeds, and acts as a natural stabilizer, holding vegetation together.

The use of ORVs has both direct and indirect impacts on the soil.

DIRECT IMPACTS:

- disruption of the soil surface/destruction of soil stabilizers
- destruction of organisms within the soil surface
- compaction of the soil

INDIRECT IMPACTS:

- acceleration of water erosion
- acceleration of wind erosion

Direct Impacts

In an analysis of methods to manage off-road use, one researcher noted, "[s]oil sensitivity to vehicles is highly variable, but all data indicate that the natural stability of soils is damaged by vehicle use."[58] Soil is held together by soil stabilizers and protected by soil crusts. When ORVs drive over the soil, their tires cut into the soil, crushing and slicing into root systems.[59] The spinning tires also uproot plants, removing another stabilizing agent.

Soil is protected by the formation of soil crusts, which can vary in type. These crusts form over the soil, protecting it from aboveground forces, and helping to ensure that it does not blow away. Soil crusts are also important for increasing stability, water infiltration and fertility.[60]

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[57] Webb, Robert H. and Howard G. Wilshire, eds. *Environmental Effects of Off-Road Vehicles: Impacts and Management in Arid Regions*. Springer-Verlag. New York. 1983. [*hereinafter* Webb and Wilshire 1983] Wilshire, Howard, Susan Shipley and John Nakata. "Impacts of Off-road Vehicles on Vegetation.". In *Transactions of the 43rd North American Wildlife and Natural Resources Conference*. Wildlife Management Institute. Washington DC 1978.

[58] Kockelman, William. "Management Concepts." *In* Webb and Wilshire 1983 [*hereinafter* Kockelman 1983]

[59] Luckenbach, R.A. and Bury, R.B. "Off-road Vehicle Impact on Desert Vertebrates, A review." *in* Berry, K.H., ed. *The Physical, Biologial, and Social Impacts of Off-road Vehicles on the California Desert*. Southern California Academy of the Sciences. Special Publication. 1978 [*hereinafter* Lukenbach et al 1978]
Webb and Wilshire 1983

[60] Belnap, Jayne. "Surface disturbances: their role in accelerating desertification." *Environmental Monitoring and Assessment*. 37: 39-57. 1995. [*hereinafter* Belnap 1995]

In addition to damaging natural stability of soil, the weight of a vehicle combined with its force travel over a soil surface results in compaction. According to Robert Webb, a former researcher for the Fish and Wildlife Service,

> One of the most important and long-lasting effects of ORV use is the compaction of the soil caused by the force of rolling wheels.[61]

As ORVs drive over soil, their weight presses soil down, increasing the soil density. This effect occurs to a lesser extent even due to the weight of a non-moving vehicle. In studies in the Mojave Desert, Webb found that the greatest increases in density occurred at a shallow depth, and that the greatest changes in soil properties occur within the first few passes.[62] In her research on Arches National Park, Canyonlands National Park, and Natural Bridges National Monument, Jayne Belnap discovered that the bulk density was significantly higher in the trampled areas than in the untrampled areas.[63]

By driving over soil, ORVs destroy organisms living within soil which are important parts of the food cycle. Belnap found sharp decreases in bacteria, fungi, and nematodes in each of three trampled areas (Arches National Park, Natural Bridges National Monument, and Canyonlands National Park). [64]

INDIRECT IMPACTS

Compaction, the destruction of soil stabilizers, and the crushing of plants and animals that inhabit the soil causes accelerated soil erosion and decreased plant growth, degrades the ability of water to enter soil, and increases runoff.[65] Researchers have discovered that ORV-induced erosion rates are 5 to 50 times greater than normal.[66]

The use of ORVs decreases the rate of water entering soil, and increases the volume and duration of runoff. When compaction occurs, the ability of water to infiltrate soil decreases as the soil becomes too dense for water to enter, causing a greater amount of runoff to be produced. Belnap found that although soil porosity was similar in the 0-3 cm depth (topsoil), soil porosity at a depth of 3-6 cm was significantly lower in untrampled areas. [67] Research from the U.S. Geological Survey revealed that an ORV-used drainage basin produced eight times the runoff of an adjacent unused basin.[68] Researchers from the University of Wyoming, Stanford, and the University of Washington noted:

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[61] Webb, Robert H. "Compaction of Desert Soils by Off-Road Vehicles." *In* Web and Wilshire 1983. [*hereinafter* Webb 1983]
[62] Webb 1983
[63] Belnap 1995
[64] Belnap 1995
[65] Snyder, C.T., D.G. Frickel, R.F. Hadley, and R.F. Miller. "Effects of Off-rod Vehicles Use on the Hydrology and Landscape of Arid Environments in Central and Southern California." U.S. Geological Survey. *Water Resources investigations*. 76-99. 1976 [*hereinafter* Snyder 1976]
Hinckley, Bern S. Richard M. Iverson, and Bernard Hallet, "Accelerated Water Erosion in ORV-use areas." *In* Webb and Wilshire 1983 [*hereinafter* Hinkley et al. 1983]
[66] Stull, R., S. Shipley, E. Hovanitz, S. Thompson, and K. Hovanitz. "Effects of Offroad Vehicles in Ballinger Canyon, California." *Geology*. 7:`9-21. 1979
Wilshire, H.G. "Study of 9 Sites Used by Off-Road Vehicles That Illustrate Land Modifications." U.S. Geological Survey Open-File Report. 77-601. 1979
[67] Belnap 1995
[68] Snyder 1976.

> Statistical analyses of our own data conclusively demonstrate a significant decrease in average infiltration rate and a consequent increase in volume and duration of runoff following ORV use.[69]

In addition to an increase in the amount of runoff, the destruction of soil surface stabilizers allows the runoff to gain additional sediment. ORV tires create ruts which become channels, enabling the runoff to become stronger and carry even more sediment.[70] As the channels widen, the roots of surrounding plants are undercut, causing plants to topple. The loss of plants results in the loss of additional soil stabilizers, and the width of a channel increases to an even greater extent.

ORV use increases the rate of wind erosion by removing plant life and decreasing soil moisture. With no plant life to hold it together, wind can pick up soil particles and blow important topsoil away. In arid and semi-arid lands, desert flats, fans, and bajadas are extremely susceptible to wind erosion.[71] Campsites, roads, larger trails, and other cleared areas parallel to the direction of strong winds are also at risk.

The accelerated wind and water erosion in turn decreases the quality of soil by exacerbating the effects of ORV use, resulting in a continually increasing cycle of destruction.

RECOVERY TIME

Recovery time of soils damaged by ORV use has been estimated to be extremely long. It is very difficult for soils to recover from erosion and loss of plant life because topsoils are often destroyed. Researchers have found that ORV use can permanently damage the protective surface layers of soil.[72] In some cases, even bedrock has been damaged.[73] Estimates on the recovery of damaged soils range from decades to centuries.

Jayne Belnap explored how long it would take for cyanobacterial soil crusts to recover, and estimated their recovery time to be 35-65 years for cyanobacterial biomass, 45-85 years for lichen cover, and 250 years for moss cover.[74]

Recovery of soils in the Great Basin Desert has been estimated to take 100-130 years.[75] Webb and Wilshire estimate that it would take 80-140 years in the Mojave Desert.[76] In another study of

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[69] Hinkley et al. 1983
[70] Hinckley et al. 1983
[71] Gillette, Dale A. and John Adams. "Accelerated Wind Erosion and Prediction of Rates." *In* Webb and Wilshire.1983
[72] Wilshire, Howard G. "The Impact of Vehicles on Desert Soil Stablizers." *In* Webb and Wilshire 1983
[73] U.S. Department of the Interior. National Park Service. *Draft Recreational Off-Road Vehicle Management Plan: supplemental environmental impact statement*. Big Cypresss National Preserve. September 1999.[*hereinafter* Big Cypress 1999]
Sheridan 1979
[74] Belanap 1995
[75] Knapp, P. "Soil loosening processes following the abandonment of two arid western Nevada townsites." *Great Basin Naturalist.* 52: 149-154.1992.
[76] Webb, R. H. and H. G. Wilshire. "Recovery of soils and vegetation in a Mojave Desert Ghost town,, Nevada, USA." *Journal of Arid Management*. 3: 291-303. 1980

the Mojave Desert, Bureau of Land Management researchers concluded that "several centuries may be too conservative for recovery time."[77]

## B. Impacts on vegetation

There is an extensive body of evidence showing that off-road vehicles cause extensive damage to and destruction of vegetation.

> ORVs have damaged every kind of ecosystem found in the United States: sand dunes covered with American beach grass on Cape Cod; pine and cypress woodlands in Florida, hardwood forests in Indiana; prairie grasslands in Montana; chaparral and sagebrush hills in Arizona; alpine meadows in Colorado; conifer forests in Washington, arctic tundra in Alaska.[78] (emphasis added)

According to Howard Wilshire of the U.S. Geological Survey, a single pass of one vehicle is enough to destroy smaller vegetation.[79] A few more passes are enough to kill larger plants.[80] Scientists from the U.S. Geological Survey found that "Juniper and Joshua trees more than three meters tall have been destroyed by the direct impact of four-wheel vehicles."[81]

ORVs injure or kill plants by running over them, breaking branches or parts, cutting into root systems, damaging foliage, destroying the soil surrounding a plant causing it to fall over, and crushing or harming seedlings.[82] On sand dunes, dune buggies and other off-road vehicles tear up the beechgrass. Researchers from the University of Ottowa found a lower germination rate and a higher mortality rate (91% compared with 29%) among seedlings on a disturbed shore.[83] According to the Bureau of Land Management, the use of riparian habitat by ORVs is a concern not only because of the impact to the immediate habitat, but to the surrounding watershed and the perennial waters as well.[84]

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[77] Rowlands, P.G., J.A. Adams, H.B. Johnson, and A.S. Endo. "Experiments on the Effects of Soil Compaction on Establishment, Cover and Pattern of Winter and Sumer Annuals in the Mojave Desert." Unpublished draft appendix for the California Desert Conservation Area Management Plan and EIS. U.S. Bureau of Land Management. pp. 170-222.

[78] Sheridan, David. *Off-Road Vehicles on Public Land*. Washington, DC. White House Council on Environmental Quality. U.S. Government Print. 1979.[*hereinafter* Sheridan 1979]

[79] Wilshire, Howard. "The Impacts of Vehicles on Desert Soil Stabilizers." *In* Webb and Wilshire 1983

[80] Wilshire, Howard G. Susan Shipley and John K. Nakata. "Impacts of Off-Road Vehicles on Vegetation." In *43rd North American Wildlife Conference*. Wildlife Management Institute. Washington, DC. 1978 [*hereinafter* Wilshire et. al 1978]

[81] Wilshire et. al 1978

[82] Webb and Wilshire 1983,

[83] Wisheu, Irene C. and Paul A. Keddy. "Seed Banks of a rare wetland plant community; distribution patterns and effects of human induced disturbance." *Journal of Vegetation Science*. 2:181-188. 1991 *hereinafter* Wisheu and Keddy 1991]

[84] Utah Bureau of Land Management. "North San Rafael Swell Habitat Management Plan 32." 1997. Medberry, Mike. "Overiding Utah's wilderness: the search for balance and quiet in Utah's wilderness." Southern Utah Wilderness Alliance. 1999.

INCREASE IN EROSION

By compacting soil and cutting into dirt, ORVs can injure and kill root systems and seedlings.[85]

In a study for the Fish and Wildlife Service, R. Bruce Bury concluded that moderate ORV use reduced shrub biomass by 50%, and heavy use reduced it by 70%.[86] This decrease in plant biomass results in a cycle of increasing destruction, because, as plants die out, fewer plants remain to hold the soil together, more soil erosion occurs, and the area devoid of plants expands.[87]

INCREASE IN NON-NATIVE PLANTS

Furthermore, as researchers from the University of Ottowa discovered, disturbances by ORVs result in a decrease of rare species and an increase in common species.[88] Bury found that a single pass of a dirt bike provides enough disturbance of the soil for weedy vegetation to take over.[89] Along with destroying plants and soil and creating space for weedy vegetation, ORV use helps spread weeds.[90] Seeds become attached to the vehicle as it moves through an area, then are dispersed.

SECONDARY (INDIRECT) AREAS OF DESTRUCTION

According to Bury and Wilshire, sites downslope of ATV use areas often develop environmental impacts similar to ORV use areas, resulting in patches of bare land farther off from the actual area of use.[91] For example, by increasing soil erosion in an upslope area, ORVs increase the amount of dust and soil moving downslope. The soil can smother vegetation where it lands, causing similar erosion and vegetation effects in the downslope area.[92]

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[85] Webb and Wilshire 1983
Wilshire et al 1978
Geological Society of America. "Impacts and Management of Off-Road Vehicles." Committee on Environment an Public Policy. Boulder, CO. 8 p. 1977. [*hereinafter* Geological Society]

[86] Bury, R. Bruce, Roger A. Luckenbach, and Stephen D. Busack. "Effects of Off-Road Vehicles on Vertebrates in the California Desert." *Wildlife Research Report* 8. United States Department of the Interior. Fish and Wildlife Service. Washington, DC 1977.

[87] Keefe, J. and K. Berry. "Effects of off-road vehicles on desert shrubs at Dove Springs Canyon." In K.G. Berry, ed. *Preliminary Studies on the Effects of Off-Road Vehicles on the Northwestern Mojave Desert: a collection of papers*. Privately published. Ridgecrest, California. Pp. 45-57. 1973
Webb and Wilshire 1983

[88] Wisheu and Keddy 1991

[89] R. Bruce Bury. "What We know and Do Not Know About Off-Road Vehicle Impact on Wildlife." *In* Andrews Richard n. and Paul Nowak. *Off-road vehicle use: a management challenge*. U.S. Dept. of Agriculture, Office of Environmental Quality. Washington, DC. 1980. [*hereinafter* Bury 1980]

[90] BLM and Forest Service,1991.
Trunkle, T. and P. Fay. *Transportation of Spotted Knapweed Seeds by Vehicles*. Proceedings: Montana Weed Control Association, Butte, MT. Jan. 14-16. 1991.

[91] Wilshire 1983

[92] Wilshire et al. 1978

## C. Air and water quality

According to the California Air Resources Board (CARB), two-stroke and four-stroke off-road motorcycles and ATVs produce 118 times as many smog-forming pollutants than are produced by modern automobiles on a per-mile basis.[93]

Nineteen percent of ATVs are powered by two-stroke engines, and the rest are powered by four-strokes.[94] Two-stroke engines discharge one-third of their fuel unburned into the environment and are one of the largest unchecked sources of hydrocarbon pollution nationwide. While four-stroke engines are much cleaner than two-strokes, they are still much more polluting than modern car engines are, dumping three-four times as many pollutants into the air and water.[95]

ATVs emit a number of pollutants, including aldehydes, 1,3, butadiene, benzene, and other polycyclic aromatic hydrocarbons (PAHs).

On average, two and four-stroke ATVs produce over 4,000 times more carbon monoxide emissions than are produced by modern cars (543 g/kw-hr vs 0.12 g/kw-hr).[96] Exposure to excess levels of carbon monoxide has been found to cause dizziness, headaches, concentration lapses, throat irritation, impaired judgement, nausea, and death.

ORVs, including ATVs, also impair air quality by creating a large amount of dust (often termed fugitive dust) while traveling in dry areas. The dust decreases visibility, aggravates asthma and bronchitis, and, in areas with a high asbestos content in soil or rock, can be carcinogenic to humans.[97]

### Water Quality

Water quality is affected by ATVs, and other ORVs, both by their emission of pollutants and the impact of soil erosion. Because many ATVs travel along or in streambeds, their fuel directly enters the water supply.[98] A study from Miami University, funded by the National Marine Manufacturers Association, found that PAHs kill zooplankton at extremely low levels (5 –70 parts per trillion), and reduce fish growth by up to 46%.[99] This problem is dramatized by the findings of Dr. John Giesy, a Distinguished Professor of Fisheries and Wildlife at Michigan State

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[93] California Air Resources Board. "Program Update for Off-Road Motorcycles and ATVs." (http://www.arb.ca.gov/msprog/offroad/mcfactst.htm), Page last updated October 22, 1998. Viewed September 21, 1999.
[94] "Emission Modeling for Large SI Engines." Environmental Protection Agency memorandum from Alan Stout to Docket A-98-01m (document II-B-01). January 28, 1999.
[95] California Air Resources Board. Program Update for Off-Road Motorcycles and ATVs." (http://www.arb.ca.gov/msprog/offroad/mcfactst.htm) Updated October 22, 1998.
[96] "Emission Modeling for Large SI Engines." Environmental Protection Agency memorandum from Alan Stout to Docket A-98-01m (document II-B-01). January 28, 1999.
[97] Sheridan 1979, Webb and Wilshire 1983
[98] Webb and Wilshire 1983
[99] Oris, James T. et al., "Toxicity of Ambient Levels of Motorized Watercraft Emissions to Fish and Zooplankton in Lake Tahoe, California/Nevada, USA." Center for Environmental Toxicology and Statistics. Miami University. Oxford, OH, April, 1998.
Testimony of John P. Giesy at Tahoe Regional Planning Hearing on Boating Impacts, February 26, 1997.[*hereinafter* Giesy 1997]

University, that natural ultraviolet light can increase the toxicity of PAHs on water surfaces by as much as 50,000 times under field conditions.[100]

Furthermore, after ORV use has disturbed soil (*see section IIIA),* when the soil is wet or on a steep slope, it is carried into streams and waterways. If it is dry, it is blown into the waterways. In those waterways, the additional soil reduces water quality by increasing the process of sedimentation, which can kill aquatic plants and organisms.[101] According to a report by the Forest Service and Bureau of Land Management, off-highway vehicle use causes an increase in locally eroded sediment to the stream channel through:

> … the creation of wheel ruts and concentration of surface runoff, the existence of tracks and exposed surfaces, the compaction and subsequent reduction in the infiltration rate of soils leading to increased surface runoff, backwash from the vehicle and undercutting of banks by wave action.[102]

The report also noted that under Section 303 (d) of the Clean Water Act, "[t]he cumulative erosion resulting from a dispersed, expanding, and non-maintained motorized trail system could be considered a nonpoint source of pollution." (emphasis added)

ORV use can also change the local temperatures of streams, causing the extreme temperatures to increase.[103] This occurs because the loss of vegetation surrounding a water source resulting from ORV use can lead to a decrease in shade. In addition, localized extreme temperatures can increase when ORV use flattens the streambank angles and reduces overall waterdepth. The temperature of water sources is vital for the productivity of the ecosystem.

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[100] Giesy 1997

[101] Webb and Wilshire 1983

Sheridan 1979

Department of the Interior. Heritage Conservation and Recreation Service. *Environmental Impact Statement., Departmental Implementation of Executive Order 11644, as amended by Executive order 11989, Pertaining to Off-Road Vehicles on Public lands*. April 17, 1978.

[102] BLM and Forest Service 1999

[103] BLM and Forest Service 1999

## D. Wildlife impacts

In their report on off-road vehicles, the Geological Society of America noted, "where ORV use is heavy, virtually all existing life is ultimately destroyed."[104] Bury, in his studies of the Mojave Desert, found:

> [A] statistically significant decrease in species, number of individuals, and biomass of mammals and reptiles on ORV-used areas compared with control sites.[105]

This decrease in wildlife occurs as a result of both direct and indirect impacts of ORV use.

DIRECT

- Collisions with and crushing of animals
- Destruction of habitat
- Animals frightened away from shelter/important habitat
- Impairs the hearing of wildlife

ORVs drive directly on the ground, running over ground species such as frogs, desert tortoises, and salamanders. In Lake Mead National Recreation Area, park staff reported that they have found desert tortoises killed by four-wheel drive vehicles.

Shelters used by many small animals – logs, leaf litter and soil burrows – are destroyed when ORVs drive over them.[106] Bird nests either on the ground or in bushes and shrubs are also crushed.[107] ORVs drive over and crush burrows that are important for desert tortoises and other wildlife.[108] Piping plover chicks have a high chance of getting run over by ORVs, because they stand inside, walk, and run along ORV wheel ruts, have difficulty climbing out of deep ruts, and are difficult to see.[109]

A report by researchers from the Massachusetts Division of Fisheries and Wildlife, U.S. Fish and Wildlife Service, and the University of Massachusetts at Amherst, found that "ORV use, even at levels less than or equal to 5-10 vehicle passes per day, is a threat to unfledged piping plover chicks and adults during brood-rearing periods."[110](emphasis added) The report further recommends "banning recreational vehicles and all but essential administrative and service vehicles on sections of beaches where unfledged piping plover chicks are present."

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[104] Geological Society 1977
[105] Bury, R. Bruce, Roger A. Luckenbach, and Stephen D. Busack. "Effects of Off-Road Vehicles on Vertebrates in the California Desert." United States Department of the Interior. Fish and Wildlife Service. *Wildlife Research Report* 8. Washington, D.C. 1977. [*hereinafter* Bury 1977]
[106] Geological Society 1977
[107] Bury 1977
[108] Bury 1977
[109] Melvin, Scott M.. Anne Hecht, and Curtice R. Griffin. "Piping Plover Mortalities Caused By Off-road Vehicles on Atlantic Coast Beaches." *Wildlife Society Bulletin*. 22:409-414. 1994 [*hereinafte*r Melvin et al.]
[110] Melvin et al.

The destruction of habitat and crushing of species and shelters is not limited to the land – aquatic life is also impacted by ORV use. ORVs often drive along or in streambeds, running over birds, amphibians, fish, and other creatures which live in the waters.[111]

According to the US Bureau of Outdoor Recreation, ORVs frighten many animals from shelter, increasing the chance of predation and being crushed by an ORV.[112]

Research reveals that noise from ORVs can harm the hearing of some wildlife. In a study on the effects of dune buggy noise on the Mojave Fringe-toad lizard, the lizards suffered hearing loss after being exposed to the sounds for a short duration.[113] Not only do such sounds cause hearing loss, but they can also alter important behavior patterns in significant ways. In the case of Couch's spadefoot toad, the sounds created by thunderstorms act as an environmental cue for the toads to emerge from under the ground and feed. Researchers found that noise from motorcycles causes the same reaction, resulting in changes in the toad's seasonal pattern.[114] Sound created by off-road vehicles can also hide the sounds of a predator or prey, or harm the hearing of a creature, thereby impairing its ability to hear an approaching predator or prey. Dune buggy noises "seriously" impair the behavior and hearing of Desert kangaroo rats, harming their ability to detect predators.[115] Furthermore, off-road vehicle noise "drowns out the calls for animals that are essential for mating, warnings, territorial behavior, and other social interactions," which can have impacts on population sizes and dynamics." [116] (emphasis added)

The impacts on wildlife are especially critical to the desert tortoise, which is a very long-lived species with a long reproduction cycle.[117] Unlike the death of a short-lived species, the death of a tortoise which should live for another 10 years seriously alters the balance of reproduction and predation.

INDIRECT

- Destroys food sources
- Disturbs and destroy s breeding sites
- Alters food chain

ORVs also have indirect impacts on wildlife by destroying habitat – food sources, shelter, breeding sites – and altering the food chain. By destroying plants, ORVs harm the animals that depend on the plants as food sources, shelter, or habitat.[118] Sheila Byrne, of the University of California at Berkeley, found that there was a direct correlation with the loss of ground cover and

[111] Bury, R. Bruce. "What We Know and Do Not Know About Off-Road Vehicle Impacts on Wildlife." *In* Andrews, Richard N. L. Aand Paul Nowak. *Off-road Vehicle Use: A Management Challenge*. U. S. Department of Agriculture. Office of Environmental Quality. Washington D.C. 1980.
[112] Webb and Wilshire 1983
[113] Brattstrom, Bayard H. and Michael C. Bondello. "Effects of Off-Road Vehicle Noise on Desert Vertebrates." In Webb and Wilshire 1983. [*hereinafter* Brattstrom and Bondello 1983]
[114] Brattstrom and Bondello 1983
[115] Brattstrom and Bondello 1983
[116] Webb and Wilshire 1983
Bury et al. 1977
[117] Bury et al. 1977
[118] Bury et al. 1977, Belnap 1995, Luckenbach et al. 1978

a smaller diversity of ground species.[119] She found disturbed areas to have a species diversity index of 1.28 whereas undisturbed had a species diversity index of 2.72. As a result, the animals which depend on the plants destroyed by ORVs as sources of food might starve. The decrease in the amount of plant cover also causes increased predation.

When ORVs kill adult animals, either directly or indirectly, the young are left to fend for themselves, leading to increased incidents of young or juvenile deaths.[120]

Scientists have also reported that important breeding sites for salamanders, insects, and birds are disturbed or destroyed by ORVs. Stephen Busack found that ORV use caused a decrease in lizard populations.[121] Bury found that the impact on feeding and breeding bird habitats caused population decreases in diversity, density, and biomass estimates.[122] In the Mojave Desert, breeding bird populations were reduced by 50% as a result of moderate ORV use.[123] Researchers have discovered that the wildlife in desert wash banks (birds, burrowing creatures, etc.) is negatively impacted by ORV use.[124] In Virginia's Back Bay National Wildlife Refuge, ORV use destroyed the tern nesting colony areas and harmed the populations of ghost crabs, sanderlings, and loggerhead sea turtles.[125]

Compacted soil can also affect the survival of species. For example, the loggerhead sea turtle cannot dig holes for laying eggs in compacted sand.[126] Young loggerhead sea turtles also get trapped in the ruts created by the compaction of the tires, which makes them easy prey, as well as raising the odds of being run over.[127]

The impacts of ORVs on wildlife have repercussions throughout the food chain. Damage to vegetation or a decrease in the amount of prey available can lead to a food shortage for larger animals, such as deer, elk, and bears. ORV use may also lead animals to avoid or abandon a site, or to use the area more, both of which result in behavior alterations and impacts on population and predation.[128] Furthermore, disturbance by vehicles can cause an animal to experience physical stress, which can change their expenditure of energy and result in changes in growth and reproduction.[129] Researchers found that when harassed by ATVs, Mule deer "responded with

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[119] Byrne, Sheila. "The Effect of Off-road vehicle use in the Mojave Desert on Small Mammal Populations." *in* Kristin H. Berry, ed. Preliminary Studies of Off-Road Vehicles on the Northwestern Mojave Desert: a collection of papers. Privately published. 1971.
[120] Webb and Wilshire 1983
[121] Busack, S.D. and R.B. Bury. "Some effects of Off-road Vehicles and Sheep Grazing on Lizard Populations in the Mojave Desert." *Biological Conservation*. 6(3): 179-183. 1974
[122] Bury et al. 1977
[123] Luckenbach, R.A. "An Analysis of Off-road Vehicle Use on Desert Avifaunas." In *43rd North American Wildlife Conferenc*e. Phoenix, AZ. 1978
[124] Sheridan 1979
[125] Department of the Interior. Bureau of Sport Fisheries and Wildlife. Environmental impact Statement "Proposal Relating to Restriction of Vehicular use on the Back Bay National Wildlife Refuge, Virginia." December 29, 1972.
[126] Sheridan 1979
[127] Sheridan 1979
[128] Knight, R. L. and D. N. Cole. "Effects of Recreational Activity on Wildlife in Wildlands." In *Transactions of the56th North American Wildlife and Natural Resource Conference*. 1991.
BLM and Forest Service 1999.
[129] BLM and Forest Service 1999.

noticeable behavioral and reproductive changes."[130] Bury found that moderate ORV use reduces the biomass of an area's terrestrial vertebrates by almost 60%, and heavy-use areas suffered a 75% decline in biomass.[131]

In his closing remarks on the impacts of ORV use on wildlife, Bury commented:

> There is little question that ORVs disrupt habitats and **cause significant declines** in the nation's wildlife resources.[132] (emphasis added)

## E. Noise pollution

All-terrain vehicles generate noise that is particularly disruptive and irritating to wildlife and recreationalists. Even with mufflers, noise levels from all-terrain vehicles are found to be in the range of 81-111 decibels (dB) per unit, comparable to that of a city street.[133] The American Hospital Association recommends hearing protection for noise levels exceeding 85 dB.

In general terms, components of sound which make a noise more irritating to humans include: intensity, duration, the presence of puretone components, pulses or fluctuations, time of day, the activity disrupted, the listener's predisposition toward the noise generator and the background noise of the area, actual or anticipated.[134]

Decibels

Sound occurs as a result of physically displaced energy in a medium with properties of mass and elasticity such as our physical environment. A vibrating object creates and dissipates sound waves. The frequency of sound is expressed in cycles per second or hertz (Hz). The sound intensity or strength is expressed as a ratio of sound pressure level over a base reference level. The logarithmic decibel scale (dB) quantifies these levels. This intensity is a physical quantity based solely on its sound pressure level, whereas a sound's loudness depends upon both intensity and frequency. The "A" weighted scale (dBA) is designed to account for frequency as well as sound pressure (intensity). Because human response to frequency is not linear, the A-scale better measures "loudness" for the human ear.

For a sound to be noticeable to humans over existing background noise levels, it is a generally accepted fact that the sound pressure must double. In terms of decibel levels, an increase of just three decibels doubles the sound intensity. In simple terms:

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[130] Yarmoloy, Cornel, Max Baer, and Valerius Geist. "Behavior Responses and Reproduction of Mule Deer, *Odocoileus hemionus*, Does Following Experimental Harassment with an All-Terrain Vehicle." *Canadian Field-Naturalist*. 102(3):425-429. 1988

[131] Bury et al. 1977

[132] Bury 1980

[133] Scharf, Laura and Jim. "Sound Testing: decibel levels for stock & modified mufflers." *Dirt Wheels*. December 1999. These measurements were compiled by the Oregon Dunes National Recreation Area at a distance of 20'.

[134] San Juan County Planning Department and Aquatic Resources Conservation Group. "Personal Watercraft Use in the San Juan Islands, a report prepared for the Board of County Commissioners, San Juan County, Washington." Provisional Final Draft,. Pg. 35. September 7, 1998.[*hereinafte*r San Juan/Tahoe]
"Motorized Watercraft Environmental Assessment 5-4."Tahoe Regional Planning Agency. Summer 1997

- A 3 dB increase makes the sound change noticeable;
- A 6 dB increase is clearly noticeable;
- A 10 dB change represents a ten-fold increase in sound pressure, and is considered to be twice as loud;
- A sound at 90 dB produces 100 times more sound pressure than a sound at 70dB, and is therefore 8 times as loud.
- The effects of a 20 dB increase are listed as "striking."[135]

In many areas recreation managers are setting limits on sounds from all-terrain vehicles.

Many ATVs use mufflers or aftermarket silencers to reduce sound levels. Unfortunately, as explained by Sharon Stewart, an Off-Highway Vehicle Coordinator at the Oregon Dunes National Recreation Area, these additions do little to reduce decibel levels because they are designed for "closed-course" competition. In addition, they are often not maintained properly.

In the National Parks, "natural quiet" is a protected resource defined as the "sounds produced by the natural and cultural components of the park."[136] National Park Service policy mandates that the Park Service "strive to preserve the natural quiet and the natural sounds associated with the physical and biological resources of the parks."[137] Furthermore, the Park Service must monitor, prevent or minimize unnatural sounds that adversely affect park resources or a park's "scenic and aesthetic values," or which disturb park users. To achieve these standards, the Park Service prohibits: [138]

> [o]perating motorized equipment or machinery such as … [a] motor vehicle … in a manner: (I) That exceeds a noise level of 60 decibels measured on the A-weighted scale at 50 feet; or, if below that level, nevertheless; (II) makes noise which is unreasonable considering the nature and purpose of the actor's conduct, location, time of day or night, purpose for which the area was established, impact on park users, and other factors that would govern the conduct of a reasonably prudent person under normal circumstances. (emphasis added)

According to Jack Palchi, the Off-Highway Vehicle Program Manager for the Colorado State Parks, typical ATVs produce 72 dBA, running at less than 35 mph, and 86 dBA at greater than 35 mph, measured at a distance of 50 feet –exceeding by far the National Park Service's limits of 60 dBA.[139] These noise levels are comparable to freeway traffic at 50 feet, or average urban street traffic.[140] In comparison, a forest produces 15 dbA.[141]

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[135] Noise Pollution Clearinghouse @ http://www.nonoise.org, November 9, 1998
[136] 64 FR 3969-3972
[137] Management Policies 1988.
[138] Management Policies 1988.
[139] Conversation with Jack Palchi, Off-highway Vehicle Program Manager, Colorado State Parks. 1999.
[140] San Juan/Tahoe
[141] Tahoe Regional Planning Agency. "Motorized Watercraft Environmental Assessment. 1997.
Minnesota Pollution Control Agency Noise Program. "Lake Bronson State Park Personal Watercraft Noise Study 4." 1994

## V. ATVS AND ACCIDENTS

In 1997, there were an estimated 54,500 ATV-related injuries.[142]

In the late 1980s, the Consumer Product Safety Commission (CPSC) investigated safety issues regarding all-terrain vehicles, and their findings led them to file suit against the ATV industry. In 1988, the CPSC and the ATV industry arrived at a settlement, the purpose of which was to reduce further accidents. The settlement included a ban on the sale of new three-wheeled ATVs, a ban on children riding adult-sized ATVs, pro-safety marketing requirements, and safety recommendations to drivers.[143] In spite of this agreement, the number of accidents remains high.

### TYPES OF INJURIES

In the CPSC's 1998 study on ATV injuries, they found that the majority of injuries were arm fractures/dislocations.[144] The second most frequently occurring injury was laceration to the head. Of the injuries to the head, most of them were concussions or internal organ (brain) injuries.

### CAUSES OF INJURIES

According to the CPSC, the most common action leading to injury is collision with an obstacle. The second is the driver changing direction and/or speed. Other causes include loss of traction, loss of balance, stalling, machine malfunction, and distraction of the driver.

*Design*

The agreement banned the sale of new three-wheel ATVs, but according to the CPSC, 22% of ATVs currently in use (1998) are three-wheeled. Furthermore, although the settlement agreement outlawed children from riding adult-sized ATVs, the percent of children injured compared with others remains high (47% now, compared with 46% in 1988). Even though children were warned not to drive adult-sized ATVs, 95% of injured children were driving ATVs larger than recommended for their age. In the Journal of Pediatric Surgery, three doctors concluded that "the consent decrees [settlement] have [has] had little effect on reducing the injuries in children from ATVs and should be reevaluated."[145]

The reason for high injury rates lies in the design and marketing of ATVs. ATVs are marketed and designed for use in uneven, hilly terrain, with a single operator straddling the machine. Balance on the machines is difficult, and even a slight shift in weight can send the operator tumbling or flip the machine over longitudinally or latitudinally. The CPSC found that 49% of the injuries in their safety study involved tip-over of the ATV. For accidents involving three-wheels, 59% tipped over, and for four-wheels, 45% of the accidents involved a tip-over.

*Thrill-riding/Unsafe Practices*

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[142] CPSC 1998.
[143] Unisted States of America Vs. American Honda Motor Co., Inc., Yamaha Motor Corp., U.S. Suzuki Motor Corp., Kawasaki Motors Corp., U.S.A, et al. Final Consent Decree. Civil Action No. 877-3525 GAG. April 28, 1988.
[144] CPSC 1998
[145] Lynch, James, Mary Gardner, and Jonathan Worse. "The Continuing Problem of All-Terrain Vehicle Injuries in Children." *Journal of Pediatric Surgery*. Vol. 33, No. 2 (February). 1998

Despite the settlement agreement, CPSC advisories, and other regulations, ATV riders continue to follow unsafe practices. According to the CPSC, only 51% of ATV drivers wear helmets, and they do so only half of the time. ATVs are not designed to carry passengers, but 75% of ATV riders reported carrying passengers. The CPSC and others strongly recommend not driving on paved roads, but 26% of ATV drivers reported using paved roads.

The National Park Service is required to regulate activities in order to ensure the safety of park visitors. The Park Service's Management plan states that:[146]

> [The]… Park Service will not allow a recreational activity in a park or in certain locations within a park if it would involve or result in … unacceptable levels of danger to the welfare or safety of the public, including participants. (emphasis added)

Not only are participants in danger of being injured, other recreationalists in the area are also at risk. In 1997, 56 of the deaths associated with ATVs were as a result of collisions with objects, other ATVs, or other vehicles.[147]

[146] U.S. Department of the Interior. 1988.
[147] CPSC 1998

## VI. CONFLICTS WITH OTHER USERS

Most visitors go to the National Parks to hike, camp, enjoy the scenery and natural quiet, take pictures, view wildlife, and go sightseeing.

Social Conflicts

Managers at Beaverhead National Forest also experienced conflicts between ORV users and other forms of recreation:

> Conflicts between motorized and non-motorized users, disturbance to wildlife (including cross-country pursuit), and ground disturbance violations increase yearly.[148] (emphasis added)

The Environmental Impact Statement for Beaverhead National Forest also found social conflicts between horseback riders, hikers, and motorized users.

In their ORV management plan for Montana, North Dakota and portions of South Dakota, the Bureau of Land Management (BLM) and Forest Service found that the concerns of non-motorized recreationalists with motorized vehicles included:

> … noise, the smell of gas, dust, safety issues, wildlife displacement and harassment, and resource damage. Some commenters indicated that motorized and nonmotorized areas are not compatible; when motorized use begins in an area, the nonmotorized users go elsewhere.[149]

For people who visit the National Parks to escape from the city or suburbs, to view wildlife and vegetation, and to experience the natural world, motorized forms of recreation are an unwelcome aberration.

Loss of Natural Scenery

In the recent draft Management Plan by Big Cypress National Park and Preserve (November 1999), park staff note that: "[t]he rutted tracks, impacted vegetation, and muddy water caused by ORV use detracts from the natural beauty of the preserve [for other visitors]."[150] (emphasis added) They also concluded that: "[b]irds and other wildlife would be more visible if the noise of ORVs is restricted to one area and buffered from non-motorized users." [151]

Conflicts with non-motorized hunters

In park units where hunting is allowed, conflicts occur between the motorized hunters (e.g. hunters riding ORVs) and the non-motorized hunters (e.g. hunters on foot). According to the BLM and Forest Service, conflicts arise because of the noise produced by ORVs as well as from

[148] Department of Agriculture. Gravelly Snowcrest Trail Travel Environmental Assesment. Beaverhead National Forest. 1993
[149] BLM and Forest Service 1999
[150] Big Cypress 1999
[151] Big Cypress 1999

the differences in hunting tactics. ORV noise scares away prey which hunters on foot have been tracking. Conflict also arises from hunters on vehicles tracking and shooting prey from their vehicle and subsequently driving through the area to pick it up.

Infringement on others' right to recreation

In an analysis of the issues regarding the management of off-road vehicles, a researcher concluded:

> ORV use, if unregulated, becomes an infringement on other people's right to recreation. ORV user needs cannot be met if one is to consider the needs and rights of others in a multiple-use context. It is an irreconcilable difference. Whereas a backpacker might intrude on a bird watcher's sanctuary, such intrusions are rare and repairable. However, the mobility and numbers of ORV users disturb all other recreational users…..One of the consequences of ORV use is the creation of conflicts with almost every other use.[152] (emphasis added)

Often, ORV users argue that it is only a few "bad apples" causing negative impacts to the environment and wildlife, but in a report for the White House Council on Environmental Quality, Daniel Sheridan points out:[153]

> Idaho BLM director William L. Matthews argues that 'the number one factor that determined the level of environmental impacts and user conflicts is the human element: the operator himself. Skilled, courteous operators with properly tuned equipment can operate vehicles with minimal effect on the environment and little conflict with other users.'
> This is a widely held view among federal land managers and Heritage Conservation and Recreation Service officials, and it is largely wrong. St. Francis of Assisi [a saint known for his affinity for birds] himself while driving an ORV on wild land could not avoid diminishing the recreational experience of many non-ORVers in the same area. (Nor could he prevent much of the environmental degradation.)

According to a poll on the National Parks by Colorado State University, eighty-nine percent of Americans thought that snowmobiles should be banned or limited, and 92% thought that personal watercraft should be banned or limited in the National Parks. By inference, we may assume that a majority of the public also believes that off-road vehicle use should be banned. The poll also found that 72% of Americans rated "provid[ing] opportunities to experience natural peace and the sounds of nature" as very important.[154]

In its Management Policies,[155] the Park Service writes that:

> Unless the activity in mandated by statute, the Park Service will not allow a recreational activity in a park or in certain locations within a park if it would

[152] Kockelman, William J. "Management Concepts." *In* Webb and Wilshire 1983.
[153] Sheridan 1979
[154] Colorado State University. "National Parks and the American Public: a National Public Opinion Survey on the National Park System." Prepared for The National Parks and Conservation Association. June 1998.
[155] Management Policies 1988

> involve or result in … unacceptable impacts on visitor enjoyment due to interference or conflict with other visitor use activities.

ATVs, dune buggies, sand buggies, swamp buggies, and four-wheel drive vehicles clearly violate this policy.

## VII. IMPACTS TO CULTURAL RESOURCES

At the core of the Organic Act, the National Park Service is charged with:

> [Conserving] the scenery and the natural and historic objects and the wildlife therein, and to provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations.[156]

The use of off-road vehicles threatens the survival of fragile and irreplaceable artifacts throughout the National Park System. The artifacts are important not only to the native descendants of those who created these artifacts, but also to the studies of anthropology, archaeology, and paleontology. They are also essential parts of our National Parks.

Cultural resources, whose integrity and priceless value are dependent upon remaining untrammeled and intact, have diminished chances of surviving the impacts of ORV use. According to a report by the Bureau of Land Management and the Forest Service, "[d]ocumented ORV impacts… include artifact crushing and breakage, erosion, soil compaction and loss of ground cover." Park staff in the Alaska section of Klondike Gold Rush National Historical Park noted that historical artifacts from the gold rush have been broken or crushed by illegal ATV use.[157] Rangers at Sunset Crater National Monument in Arizona have noted their concern about the threat from ORVs to archeological sites within and surrounding the monument.

ORVs not only destroy cultural sites by driving over them, they also provide easy motorized access for vandals and looters to reach remote areas. This has been the case in the California desert, where Intaglios, petroglyphs, and other cultural artifacts were once thought to be protected by virtue of their remoteness and general inaccessibility.[158] It has also been the case on public lands in Montana, North Dakota, and South Dakota, where the Forest Service and BLM were forced to create an emergency closure of an area in 1998 to protect the cultural resources.[159]

The Archaeological Resource Protection Act of 1979 (ARPA) states that "no person may excavate, remove, damage, or otherwise alter or deface any archaeological resource located on public lands or Indian lands."[160] The National Historic Preservation Act (NHPA), Native American Graves Protection and Repatriation Act (NAGRPA), and the American Indian Religious Freedom Act (AIRFA) also protect cultural resources and sacred sites from disturbance and destruction.

By entering into the National Parks, either legally or illegally, ORVs are destroying important cultural resources. Ironically, parks established to protect resources for generations to come are losing the very precious cultural resources they were established to protect.

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[156] 16 U.S.C. § 1.
[157] Responses from the Bluewater Network Survey. 1999.
[158] Sheridan 1979
[159] BLM and Forest Service 1999
[160] "Trails of Destruction: How Off-Road Vehicles Gain Access and Funding on Public Lands" A Report by Friends of the Earth and Wildlands Center for Preventing Roads (1998) pp 7-8

## VIII. ILLEGAL USE/TRESPASSING

When directed to prohibit an inappropriate use, the National Park Service should make all efforts to ensure that such use is not occurring.

According to Bluewater Network's survey of National Parks, Seashores, Lakeshores, Recreation Areas, Monuments, and Historic Sites, 40 park units are experiencing illegal use and trespassing.

According to the survey, illegal use occurs primarily:

- when the land is adjacent to public land (BLM, Forest Service, or State) where ORV use is allowed;
- in remote or rural locations where patrolling is difficult;
- when the park does not have enough staff or funding for staff to patrol;
- and in areas close to where ORV use is allowed in National Park units (near beaches, four-wheel drive roads, hunting roads).

### A. Existing but undefined backcountry/four-wheel drive roads; beach use

Several parks with the most trespassing are units with existing but officially undefined backcountry roads, or existing use on the beach. The presence of such off-road areas is harmful to a park, resulting in roadkills, wildlife behavioral modifications (avoidance of roads by wildlife), fragmentation and isolation of populations, air, water and noise pollution, impacts on habitat (direct habitat loss, facilitated invasion of weeds, pests and pathogens, and edge effects), alteration of hydrology of watersheds, and aquatic habitats, and increased access to remote areas.[161] (*see attachment A*) Not only do off-road vehicles damage areas in which they are lawfully permitted, but when they ride illegally on pristine, unblemished land, they cause even further damage. Furthermore, allowing access to remote areas further increases the possibility of increased damage to resources in other areas.

For example, in Padre Island National Seashore (TX), ORV use is allowed on the beaches, which has created a significant problem with illegal use elsewhere in the park. According to Park staff, mudflats have been irreparably damaged, severe destruction of wetlands has occurred, and dunes have been damaged.

Solutions:

In park units such as Padre Island National Seashore (TX), where the state or country (RS 2477) controls the section of the area that is open to ORV use, the Park Service should consider working with the appropriate government agency to develop prohibitions to protect natural resources. One potential solution would be to work with such agencies to create a permitting system, which limits the number of vehicles per day, the hours of operation, and the area of operation.

Much off-road vehicle use occurs on beaches, technically undefined trail areas, and primitive backcountry and other poorly-defined access routes. To solve this problem, and to protect park resources, the National Park Service must define, categorize and classify all non-highway areas within its jurisdiction and authority. In addition, the Park Service should adopt the following

[161] Reed, Noss. "The Ecological Effects of Roads, or The Road to Destruction." See attachment A for additional citations.

definition of "off-road vehicle usage," which is currently employed by the US Forest Service and Bureau of Land Management:

> … any riding that is not on pavement or on a high-standard gravel road. Riding the primitive roads and trails on public lands is often referred to as "off-road."[162]

Immediate adoption of the above or similar definition by the National Park Service will represent the first step towards reigning in and controlling the inappropriate and damaging use of ORVs in our National Park System.

Under such a definition, more than 30,434 miles of backcountry trails in the Park System should no longer be considered roads, and vehicles traveling in those areas would be considered to be traveling off-road. According to the Code of Federal Regulations, no off-road use is to occur in any National Park, and National Recreation Areas, Seashores, Lakeshores and Preserves must appeal for special regulations. These routes should immediately be closed to motorized vehicle use, with a priority on routes through travel sensitive areas (vegetative and/or habitat).

In the case where a National Park managed beach is considered a road, all off-road use should be prohibited. Damage by off-road vehicles occurs even below the dune level at the beach; sand is compacted, organisms that live within the sand are crushed, gas and oil from a vehicle can enter the water, wildlife that use the area, such as birds, may be harmed, and the experience of the visitors is degraded. In addition, ORV use along beaches has been found to displace sand and cause increased erosion.[163]

Furthermore, allowing use on beaches can lead to increased use elsewhere. For example, Padre Island National Seashore (TX) has had significant problems with ORV drivers traveling from beaches to dunes, to mudflats, and through surrounding areas. When unable to determine the correct path for accessing a beach, vehicles may drive over a sensitive area, disturbing nesting birds or turtles.

### B. Access from Adjacent Forest Service, Bureau of Land Management Land, State Land, or other public lands

When a park unit is adjacent to public lands not managed by the Park Service, ORV users might not realize they are entering public land, or they might not believe they will be caught if they illegally enter park areas. Rangers at Sunset Crater National Monument (NM) noted that illegal use is a problem because Sunset Crater is adjacent to Forest Service lands and ORVs often trespass, whether accidentally or deliberately. Staff have noticed tremendous impacts to soil and vegetation, and are worried about the possibility of damage to archaeological resources. Yellowstone National Park also experiences illegal use around park boundaries, which staff noted may disturb wildlife, create tracks, and damage vegetation.

Solutions:

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[162] U.S. Department of the Interior and U.S. Department of Agriculture. *Summary of the Off-highway Vehicle Environmental Impact Statement and Plan Amendment for Montana, North Dakota, and Portions of South Dakota*. Bureau of Land Management Montana State Office and Forest Service. Northern Region. Draft. October 1999. [hereinafter BLM and Forest Service 1999)

[163] Sheridan1979

In cases where a Park is experiencing problems with vehicles traveling from public lands onto their lands, there are a few solutions. The first is to create partnerships with the Bureau of Land Management (BLM) and the Forest Service to inform users that they should not be trespass. For example, these agencies could place signs providing warnings at the boundaries of NPS lands (NPS vehicle-free land 500 feet away, etc.).

Another solution is for the Park Service to work with the Forest Service and BLM to develop a buffer along relevant land boundaries. In this manner, the offending vehicles would not be allowed close enough to easily trespass, and the enforcement would be shared between the public land agencies.

In their survey responses, rangers mentioned that increased use of signage might be helpful, as well as increased ranger patrols or "special fencing." For example, in Sunset Crater National Monument (NM), instead of fences, park staff have hung a thick, easily viewed cable one foot off of the ground to warn vehicle users of the boundary.

**C. Problem: Inadequate funding for enforcement**

Many of the parks reported that they do not have enough funding for ranger patrols to eliminate off-road use of vehicles. With only two or three rangers to cover tremendously large areas, it is difficult to catch and cite the trespassers. Many park staff expressed their feelings of hopelessness and frustration with controlling off-road use.

General Management Solutions:

In Bluewater Network's survey, park staff noted several management tools that they have used to reduce illegal use, which should be effective for most other park units as well:

- Public education: informing the public of the law and why off-road use is prohibited
- Ranger presentations at meetings of off-road vehicle driver groups
- Additional signage and ongoing signage maintenance
- Gates, barricades, fences, and creation of natural boundaries (hedgerows)
- Cables ("special fencing")
- Logs placed in the road
- Increased efforts to catch and cite violators
- Increased vigilance by rangers near boundaries

Increasing ORV violations are irreparably damaging our parks. Violators damage vegetation, disturb wildlife, create noise, and disturb other recreationalists. Most park rangers assess the number of violators not by apprehending them, but by viewing the tracks and the damage done by the vehicles. In many cases, other recreationalists – hikers, bikers, and climbers – alerted the Park Rangers to the presence of off-road use because of the noise, tracks, wheel ruts and damage to vegetation.

In order to adequately protect natural and cultural resources, and in keeping with its mandates, the Park Service needs to evaluate and expand its use of available management tools to overcome the problems of insufficient enforcement and the lack of funding for additional enforcement.