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## IMPACTS ON SOILS AND PLANTS

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The damage to soil and plants caused by off-road vehicles has only worsened with the increase in sales and use of these vehicles over the past 20 years. As off-road vehicles leave designated routes, they carve user-created, environmentally-destructive tracks through sensitive habitat, riparian areas and desert ecosystems. The dramatically expanding web of illegal, cross-country routes contributes to soil erosion and compaction, destroys plants, clogs streams with sediment and spreads invasive weeds.

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### **Wearing Away the Ground:**

Dirt bikes, all-terrain vehicles (ATVs) and other off-road vehicles churn up vast swaths of public lands every year with corresponding adverse impacts on soils.

- Swamp buggies and other off-road vehicles have carved more than 23,000 miles of user-created, cross-country routes throughout Big Cypress National Preserve in Florida. These routes contribute to soil erosion and alter natural water flows in a critical portion of the Everglades ecosystem.
- A report released in 2001 describes the status of BLM lands in central Alaska, “ATV trails radiate from either side of the Denali Highway. On many drier knolls and ridges, the vegetation and topsoil have been worn away, exposing mineral soil and initiating erosion. Where trails traverse permafrost and wetland terrain, glistening dark scars contrast starkly with the natural green and rust colors of the tundra. Trails crossing wetlands are often in excess of thirty feet wide. Heavy rutting is common.” (Bane, 2001)
- In the Hungry Valley of southern California, concentrated off-road vehicle use contributed to soil erosion that produced as much as 72,000 tons of sediment during a single winter season. (Griggs and Walsh, 1981)
- Many soils in arid and desert environments are stabilized and nourished with a thin crust produced over many decades through complex physical and chemical reactions. These highly important shields, commonly known as cryptobiotic crusts,

can be damaged by a single pass of a dirt bike or ATV. After the crust is destroyed, it can take as long as 250 years for it to completely recover. (Belnap and Gillette, 1997)

### **Stripping Away Vegetation:**

Off-road vehicles also have serious negative impacts on virtually all forms of vegetation. Vehicles crush, trample and break plants; damage germinating seeds; reduce vegetative cover; and can destroy crucial root systems. These impacts, particularly stripping vegetation from the ground, exacerbate other problems, including soil erosion and sedimentation.

- In the Mojave Desert, researchers found that most annual plants were destroyed after only 10 passes by a motorcycle. (Webb, 1982)
  - Vegetation in desert ecosystems is particularly vulnerable to damage by off-road vehicles because root systems are shallow and plant growth is extremely slow. In one study, researchers documented how plant cover was reduced by 39 to 96 percent in areas subject to dune buggy, motorcycle and four-wheel drive vehicle use. (Lathrop, 1983)
  - The impacts on plants extend well beyond desert ecosystems. In studies of permafrost vegetation in Wrangell-St. Elias National Park and Preserve in Alaska, scientists concluded that one-quarter to two-thirds of damage to vegetation occurred after only 10 passes by an ATV. (Ahlstrand and Racine, 1993)
  - Researchers in Canada found that after only one pass with a snowmobile “over 78 percent of
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saplings were damaged, nearly 27 percent of them seriously enough to cause a high probability of death.” (Neumann and Merriam, 1972)

- A similar study in Minnesota found that 47 percent of pines and over 55 percent of white spruce sustained damage from snowmobiles. With reduced snowfall in a subsequent year, this scientist determined that more than 92 percent of white spruce were damaged by snowmobiles. (Wanek, 1971 and 1973)

### **Spreading Noxious Weeds and Disease:**

Dirt bikes, ATVs and other off-road vehicles can spread noxious weeds and invasive plants over a wide area in only a few hours. These weeds displace native plants altering entire ecosystems and can spread to nearby fields and pastures adversely impacting farmers and ranchers.

- The U.S. Department of Agriculture reports that "invasive and noxious weeds are expected to infest 140 million acres by 2010." (Agriculture Research Service, Rangeland, Pasture and Forages Program, Integrated Management of Weeds and Other Pests.)
- The Bureau of Land Management (BLM) estimates that 4,600 acres of federal land in the west are lost each day to weed infestation. (Western Governors' Association, Combating the Economic and Environmental Devastation from Invasive Species, December 2000)
- Cornell University researchers conservatively estimate that non-native weeds cause at least \$25 billion in crop and forage losses annually. (Pimentel et al, Environmental and Economic Costs Associated with Non-Indigenous Species in the United States, June 1999)
- A study in Montana demonstrated that a single ATV can disperse more than 2,000 invasive knapweed seeds over a 10-mile radius. The research also found that these seeds are more likely to germinate and crowd out native plants in areas where soil has been compacted by off-road

vehicles. (Montana State University Extension Service, 1992)

- An updated study released in March 2001 concludes: "If knapweed continues to invade highly vulnerable lands, the potential annual loss to Montana's livestock industry would be \$155 million each year." (Montana State University Extension Service)
- The Idaho Department of Agriculture reports that "[N]oxious weeds are estimated to have a direct cost to all Idaho lands of \$300 million annually." (Idaho Department of Agriculture, Bureau of Vegetation Management, Frequently Asked Questions About Weeds)
- The spread of invasive leafy sponge in Montana, Wyoming and North and South Dakota imposes an annual loss of \$129 million on the regional economy and the net income of ranchers. (U.S. Forest Service, Draft Environmental Impact Statement for Cross-Country Travel by OHVs, Arizona National Forests, May 2003)
- The U.S. Forest Service has determined that off-road vehicles can carry a root fungus from region to region in National Forests in southwestern Oregon. This fungus has killed hundreds of rare Port Orford cedar trees in the Kalimiopsis Wilderness Area of the Siskiyou National Forest.