



**RESTORATION, BARRICADES, AND SIGNAGE**

# Detering ORV Use & Lessening Its Impacts

**T**he California Desert Protection Act of 1994 designated a number of new Wilderness Areas in Southern California because, as the act states, the wilderness values of the lands were becoming increasingly threatened by “incompatible use and development.” Anthropogenic threats to Wilderness Areas nationwide are certainly numerous and hard to ignore, including atmospheric pollutants, invasive species introduction, livestock grazing, and fire suppression. For the deserts of Southern California, however, one of the most direct and persistent human threats to Wilderness Areas is recreational ORV (off-road vehicle) use, often in inappropriate or illegal settings. Indeed, the number of illegal ORV incursions into wilderness is certainly in the thousands – too many for land management agencies to control – and is probably increasing.

### Impacts of ORV use on soil and vegetation

The impacts of ORV use upon desert ecosystems are well documented by scientists. When ORV tires come into contact with desert soil, they destroy surface stabilizers and reduce both soil porosity and water infiltration capacity. As a result, desert soils become far more susceptible to wind and water erosion. Moreover, compacted soil can greatly inhibit the root growth of desert plants. In areas where ORV use is heavy, vegetation generally becomes significantly denuded. These effects can occur after only a few vehicle passes and cause noticeable damage due to the fragility of desert soils and the slow recovery time of the desert ecosystem.<sup>1</sup>

### Impacts of ORV use on desert animals

Still, the greatest impacts of ORV use may be the effects it has had upon desert animals, including federally threatened species. Lizard population densities tend to show marked declines in areas with heavy ORV use, probably as a result of a combination of factors, including the loss of plant cover, reduction of invertebrate food sources, and trampling deaths. A study of flat-tailed horn lizard populations at Ocotillo Wells State Vehicle Recreation Area indicated that the lizards, which favor sandy areas, may have shifted or dispersed to less-suitable habitats as a result of heavy ORV use.

Desert bighorn sheep populations have also been shown to avoid areas with heavy vehicular use. A study in Canyonlands National Park indicated that the sheep tend to avoid road corridors, resulting in 15 percent less use of potential suitable habitat. Additionally, ORV use has caused a substantial loss of habitat and reduction in habitat quality for the desert tortoise. High-density tortoise populations formerly occupied many heavily used ORV areas, and continued use of these areas prevents the tortoises from reestablishing themselves.<sup>2</sup>

### Controlling ORV use

But how can illegal ORV use be controlled? Given that law enforcement rangers simply cannot be everywhere at once, there are only three realistic on-the-ground options: wilderness / closed route signs, barricades, and restoration.

For the past seven years, crews of Student Conservation Association (SCA) interns have been working in partnership with the Bureau of Land Management (BLM) to restore illegal ORV



Unauthorized Vehicle Trail before Restoration



Identical Trail after Restoration

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routes in the Wilderness and Limited-Use Areas of Southern California, developing restoration techniques that both camouflage incursions and encourage re-growth. Now the results are starting to be quantified.

From September, 2006 to May, 2007, the SCA's Wilderness Restoration Corps VII monitored 190 restored and 555 non-restored incursions into 37 different Wilderness Areas. Using this data, they assessed the effectiveness of three strategies – restoration, hard barriers, and signs – at preventing illegal ORV use.

### Restoration by camouflage

So how does one go about restoring the desert? Seven years ago, the SCA attempted to answer this question, and the solution arrived at by teams of interns was based on a very simple strategy: camouflage.

Today, the techniques in use by SCA crews are geared towards blending illegal routes in with the surrounding landscape, while, at the same time, encouraging regrowth. The most common of these techniques is called vertical mulch, whereby dead shrubs or creosote branches are gathered and replanted on illegal routes to look like real, dead bushes. Typically, seed pits are then placed at the base of the mulch, providing a convenient microclimate for new plants to grow.

Some other commonly used restoration techniques include horizontal mulch (laying dead plant matter, such as Joshua tree logs, across incursions), raking and sweeping to remove any visible vehicle tracks, adding rocks from the surrounding landscape, and decompacting soil. When done well, these techniques can trick even a discerning eye into believing that the incursion they are hiding was never there at all.

Of the 190 restored incursions, 72.1 percent had not been driven on again. In comparison, only 28.3 percent of the 555 non-restored incursions (including those with wilderness signs or barricades) were not being used.

Not surprisingly, restored incursions were significantly less likely to be used than others. But this is not all. Restoration also seemed to encourage regrowth. Indeed, one of the most commonly noted locations for regrowth was at the base of vertical mulch, where seed pits are typically placed. Thus, restoration is effective both at preventing ORV use on incursions and encouraging regrowth.

The one caveat to these restoration strategies is that restoration may not be as effective on the largest of incursions – those that can be seen for long distances – such as hill climbs. In general, restoration is probably most effective on incursions that can only be seen for distances of up to about 100 meters.

### Barricades

Like restoration, barricades can be a relatively effective means of preventing vehicle use on incursions. Of the 124 barricaded incursions monitored, 60 percent (72) were effective at preventing all vehicle use. Still, this means that in 40 percent of cases the barricades did not stop ORV users from driving on incursions. That's a high number, considering the cost and effort involved in construction.

What's more, barricades can only be used in desert environments when there are natural features on both sides to prevent users from simply going around. There are no trees in the desert to provide convenient obstacles. And even when this condition is

met, there is always the potential for vandalism.

In contrast, restoration seeks to camouflage incursions so that users will never suspect that a route has been closed. Barricades cannot accomplish this, nor do they encourage plant regrowth. However, in certain environments where restoration cannot be used easily – sandy washes, in particular – barricades may still be the most effective means of controlling ORV use.

### Signage

Of the 745 incursions monitored, approximately 327 were clearly marked with carsonite wilderness signs (not including those with barricades or wood posts). Nearly half of these incursions had at least a few sets of vehicle tracks when monitored, while another 20% had at least one set of tracks. This means that only a third of the signed incursions had not been driven on. If we exclude incursions where restoration is present, the number drops to about a quarter.

Obviously, the wilderness signs alone are not preventing illegal ORV use. This does not mean that signs are not important, though. In fact, a statistical analysis of the non-restored incursions indicates that signs do help reduce the frequency of ORV use to some extent. There also would be no way to indicate the location of wilderness boundaries without them.

The signs are simply not doing a good enough job. There are too many people driving past them. Alternative strategies, particularly restoration, must be used in conjunction with wilderness signs if ORV use is to be controlled.

### ORV use must be restricted to legal routes

For several decades, ORV use in Southern California has been a serious threat to desert ecosystems. With the designation of 69 new Wilderness Areas in 1994, this threat has become far too serious to ignore. These areas are the home to several federally threatened species. If Wilderness Areas are to serve their scientific and recreational function as pristine ecosystems unimpaired for future generations, then ORV use must be restricted to legal routes.

Seven years of restoration efforts by the SCA and the BLM have helped, but there is still much work to be done. In an age when so many impacts are seemingly beyond our control – pollution, global warming, invasive species – can we really afford to leave this one unchecked? ♦

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1 For more information on how ORVs affect desert soils and vegetation, see: R. H. Webb and H. G. Wilshire, editors. 1983. *Environmental Effects of Off-road Vehicles: Impacts and Management in Arid Regions*. Springer-Verlag, New York.

2 For more information on how ORVs affect desert animals, see: Beauchamp, et. al. 1998. Habitat Use of the Flat-Tailed Horned Lizard (*Phrynosoma mcallii*) in a Disturbed Environment. *Journal of Herpetology*. Vol. 32: 210-216; Papouchis, et. al. 2001. Responses of Desert Bighorn Sheep to Increased Human Recreation. *The Journal of Wildlife Management*. Vol. 65: 573-582; Boarman, W.I. and K. Beaman, editors. 2002. *The sensitive plant and animal species of the Western Mojave Desert*. U. S. Geological Survey, Western Ecological Research Center, Sacramento, CA.