Impacts of Off-Highway Motorized Vehicles on Sensitive Reptile Species in Owyhee County, Idaho

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INTRODUCTION

As the population of southwestern Idaho grows, there is a corresponding increase in the number of recreational users of off-highway motorized vehicles (OHMVs). An extensive trail system has evolved in the Owyhee Front, and several off-highway motorized vehicle races are proposed for any given year. Management decisions by the Bureau of Land Management (BLM) regarding the use of public lands for OHMV activity should take account of the impact of OHMV activity on wildlife habitat and populations. However, our knowledge of the impact of this increased activity on many species of native wildlife is minimal.

Of particular interest is the herpetofauna of the area: the Owyhee Front includes the greatest diversity of reptile species of any place in Idaho, and includes nine lizard species and ten snake species (Table 1). Three of these species are considered to be "sensitive" by BLM and Idaho Department of Fish and Game (IDFG): *Sonora semiannulata* (western ground snake), *Rhinocheilus lecontei* (long-nosed snake), and *Crotaphytus bicinctores* (Mojave black-collared lizard). One species, *Hypsiglena torquata* (night snake), was recently removed from the sensitive list, but will be regarded as "sensitive" for the purposes of this report.

Off-highway motorized vehicles could impact reptiles in several ways. First, they may run over and kill individuals. Second, they may collapse burrows, thereby reducing access to subterranean prey and to escape and thermoregulatory locations. Third, OHMV's may alter the habitat by changing the plant community, thereby affecting the availability of prey, of escape locations, and of shady locations.

The objectives of this study are:
1. <u>To develop techniques for studying the impact of off-road vehicles</u>. The typical method used to survey reptiles is the drift fence, which consists of a metal fence 2 feet high and 12 to 50 feet long, with funnel traps along the fence to capture reptiles. However, such fences are highly visible, and to be able to determine the presence of reptiles within feet of off road vehicle trails (where there would be a much higher rate of human visitation and therefore a higher rate of vandalism) required development of more subtle and less visible techniques.

2. <u>To gather preliminary data on the actual impacts of off-road vehicles on the reptile fauna</u>, in particular, to assess impacts on the three sensitive snake species mentioned above. One person working for one summer could not hope to answer all questions associated with the impact of off-road vehicles on reptiles.

METHODS

There are three OHMV trailheads in the Owyhee Front area: Hemingway Butte is the most heavily used, Rabbit Creek receives intermediate use, and Fossil Creek receives the least use. The present study was conducted in the vicinity of the Fossil Creek OHMV trailhead (Figure 1) because (1) it is an area of especially high reptile diversity, (2) it was easy to find unaffected control areas, and (3) we could try our "stealth" traps with less chance for vandalism.

Traditional drift fences are constructed of metal flashing and are very visible from quite a distance. We designed a trapping system that can be used in close proximity to motorcycle trails, but would attract relatively little attention from passers-by. A "fence" consisting of a 2.5 meter long piece of 1/8" mesh hardware cloth (1 ft. wide) buried so that the fence extends above ground level nine inches. Such a piece of hardware cloth is nearly invisible, but still provides a structure that will direct wandering reptiles towards either end of the fence. At each end of the hardware cloth fence we placed a funnel trap (Figure 2), constructed of a 9" diameter aluminum window screen, which had a funnel that narrowed to a 1" opening, and a 20 inch length. Each trap contained apiece of cardboard for shade. Each treatment plot consisted of two fences, one placed 2 m from the trail and one placed 25 m from the trail (Figure 3). For each treatment plot situated next to a trail, we also constructed a control plot located 200 m from the trail; the direction from the trail was determined randomly. In a very few cases, the control pair of fences fell in habitat very different from the next-to-trail treatment pair. For those cases we placed the control pair on the opposite side of the trail. We constructed a total of 26 pairs of plots located on trails varying from narrow (9 to 12 inches wide) motorcycle trails to a two track (Figure 4, Table 2).

We also censused reptiles in sandwashes, using six plots in rocky sandwashes and six plots in sandy washes. In these plots, one fence was placed at or near the center of the wash and the other placed 25 m up the bank (Figure 4). The washes chosen did not contain active OHMV trails, but should be representative of the habitat of impacted washes.

Traps were visited every other day during the first part of the season and every day as the weather grew so hot as to have a high probability of animals succumbing to the heat. Captured animals were identified, measured, then released near the point of capture. It was our experience that 128 fences (which is the size of our study) is at or near the maximum number of fences that can be checked during a day by a single worker. Trapping began on May 28 (see Table 2 for the days each array was active). Traps were disarmed for a week over the July 4 holiday, then rearmed until July 24, 1998.

Statistical Analysis

Our placement of traps at 2,25,200, and 225 m from trails allowed two different comparisons to be conducted. First, on a relatively small scale, we compared captures at the 2 m traps to those at the 25 m trap. Second, at a relatively larger scale, we compared the combined captures at the close pair offences (treatment plot: 2 m and 25 m) to the combined captures at the control pair offences (200 and 225 m). For both comparisons, we used paired t-tests.

RESULTS AND DISCUSSION

We captured a total of 12 reptiles species (5 lizard species and 7 snake species), nearly two-thirds of the species that occur in that geographic area and nearly all of the species that would be expected for such a low desert, arid habitat (Tables 1 and 3). Three of those species not captured (sagebrush lizards, short-horned lizards, rubber boas) tend to be at higher elevations

than our study site. Two other uncaptured species (both the garter snakes) tend to be found near water, which is non-existent on our site. Finally, the western skink is a secretive and relatively rare species, and the Mojave black-collared lizard was observed to fairly common in certain areas of our study site, but is quite territorial and sedentary and is limited to rock habitat.

It is clear that our "stealth" trap design can capture most of the species present in the area, including the sensitive snake species. However, our fences captured more easily those species that are widely ranging (such as western whiptail lizards and striped whip snakes) but do not do well at capturing highly territorial, relatively sedentary species (such as collared lizards). This is the same trend one would see from traditional drift fences. Because we did not erect traditional drift fences (long, high, and unclimbable), we are not able to make comparisons regarding the effectiveness of shorter, lower, and more climbable "stealth" fences and traditional drift fences.

Effect of Trails

Combined captures of all lizard species and of all snake species showed that proximity to OHMV trails had no detectable effect on numbers of reptiles (Figures 5 and 6). For both groups there was no substantial overall trend, and in some species (e.g., the side blotched lizard, the leopard lizard, and the whip snake) there was actually a trend towards more captures at the 2 m trap than at the 25 m trap (Table 2). This is likely the result of a combination of two factors. First, the trails in our study site are relatively lightly used, so impacts on the reptiles should be less severe. Second, the trails do have at least one positive. Much of the habitat in our study area contains cheat grass (*Bromus tectorum*), which can occur in quite dense stands, making movement by reptiles difficult. OHMV trails open up bare patches that can be traversed relatively rapidly by reptiles. We hesitate to make too much of this potentially positive effect because it would be operative only at low OHMV usage-at higher usage, many of the reptiles attracted to the bare areas would be killed by vehicular passage.

Sensitive Snake Species

Interestingly, for the two snake species deemed as "sensitive" and captured in our traps in OHMV trail treatment and control plots, we detected a negative effect of proximity of OHMV trails-more longnose snakes and night snakes were captured at the pair of fences 200 and 225 m from trails than at the pair of fences 2 and 25 m from trails ($P = .057$ for both species combined; Figures 7 and 8). This is an important result, indicating a potentially detrimental effect of OHMV activity. However, due to the short duration of this study and the relatively small number of animals captured, we urge that this result be confirmed before major management decisions are made.

Washes as habitat

Washes proved to be important habitat for two sensitive snake species (night snakes and ground snakes) and are important for collared lizards as well. Night snakes and ground snakes were more common in or near rock washes (washes with at least some rock substrate on the sides of

the wash) than in or near sandy washes (Figures 9 and 10), probably because the rock habitat provides more hiding places. The two sensitive snake species captured in or near washes differed in their affinities. Western ground snakes were captured only in or near rocky washes, and were more common on the banks of the washes 25 m from the center than in the center of the wash. Night snakes were more common in rock washes than in sandy washes, and were captured more commonly in the center of the wash than on the bank (Figures 7 and 8).

Washes are apparently often used as trails by OHMVs, with the potential to heavily impact reptiles that might use them as habitat. Our findings indicate that (a) western ground snakes were only captured in or near washes, and (b) night snakes were captured at higher densities in washes than at our treatment and control plots. However, both species are nocturnal, and are unlikely to spend the day in the highly unstable substrate of wash bottoms. Therefore, OHMVs that remain in the wash proper should have little impact on ground snakes and night snakes. OHMVs that use bank areas could have substantial impacts on both snake species.

CONCLUSIONS

1. We were unable to detect negative impacts to the reptile fauna when taken as a whole. Possible explanations are: (a) There may have been no actual overall effect of OMHVs on reptiles. (b) We were dealing with trails that receive relatively little traffic; more traffic might have a greater effect. (c) Our trapping was conducted over a two-month period by one individual; we therefore have a relatively small data set which may be too small to detect effects. (d) Positive effects on some species (opening of habitat may favor western whiptails) may obscure negative effects on other species.

2. We have some indication that sensitive snake species, especially long-nosed snakes, are negatively affected by OHMV activity. However, due to our relatively low sample sizes and the short duration of this study, we hesitate to label this finding as definitive.

3. Washes are important habitat, but day use by OHMV s that remain in the unstable portion of the wash are unlikely to have much impact on reptiles, as the reptiles spend the day in burrows or under rocks on the sides of the washes.

4. Our "stealth" design traps are able to capture the reptile species present at the site. They are, however, short and easily climbable, so probably capture fewer reptiles than traditional trapping arrays.

5. A total of 128 fences is at or near the upper limit of what one person can visit in a day.