UPDATE ON THE STATUS OF THE ISLAND SPOTTED SKUNK

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ABSTRACT

The island spotted skunk, an insular endemic carnivore that occurs on only Santa Cruz and Santa Rosa islands, is listed as a subspecies of special concern by the State of California. Our prior research indicated that skunks were relatively rare, specialized in their resource use, and particularly sensitive to environmental perturbations. Consequently, we suggested that the continued existence of the island spotted skunk was precarious and recommended further monitoring of their population status. Surprisingly, trapping on Santa Cruz Island in 1998 revealed an overall trap success (3.8%) nearly seven times higher than our overall trap success in 1992 (0.57%). Although trapping design differed between years and sample sizes are small, the higher trap success of island spotted skunks, in conjunction with a recent increase in skunk sightings, suggests a population increase on Santa Cruz Island over the past six years. An increase in spotted skunks on Santa Cruz Island may be driven by a combination of factors, including normal variation in population size, a slow response to recovery of the island following removal of cattle and feral sheep, or the potential decline of island foxes, a direct competitor with skunks.

Keywords: Island spotted skunk, Santa Cruz Island, population increase.

INTRODUCTION

The island spotted skunk (*Spilogale gracilis amphiala*), a subspecies of the western spotted skunk, is an insular endemic carnivore that occurs on the two largest California Channel Islands, Santa Cruz and Santa Rosa. Due to small populations and limited distribution, the island spotted skunk is listed as a subspecies of special concern by the State of California. Prior to our published research on spotted skunks on Santa Cruz Island in 1992 (Crooks 1994a,b; Crooks and Van Vuren 1994, 1995), the status and ecology of the island spotted skunk was unknown. Our results indicated that skunks were relatively rare, specialized in their resource use, and were particularly sensitive to environmental perturbations. Consequently, we suggested that the continued existence of the island spotted skunk was precarious and recommended further monitoring of their population status. Herein we present recent data tentatively suggesting a population increase in the island spotted skunk population on Santa Cruz Island.

STUDY AREA AND METHODS

Santa Cruz Island (250 km^2) is located 40 km south of Santa Barbara, California. The island is 39 km long and 3 to 11 km wide. A system of interior valleys, including the large Central Valley, is oriented in an east-west direction and bounded by mountain ranges on the north (maximum elevation 750 m) and the south (465 m). Climate is a maritime Mediterranean-type, with hot, dry summers, and cool, wet winters.

In April and September 1998, we sampled island spotted skunks along road transects that totaled about 30 km in length throughout the central portion of the island. Skunks were live-trapped in single-door box-traps set every 250 to 500 m and baited with commercial cat food and fruit paste baits. Although population densities of skunks were not calculated, we obtained an index of their relative abundance through trap success, defined as number of captures divided by number of traps available (traps set minus traps sprung but empty). We calculated overall trap success for the entire study as well as separately for each trapping session (April and September).

RESULTS AND DISCUSSION

We captured one skunk during 130 trap nights in April (0.77% trap success) and nine skunks with no recaptures during 133 trap nights in September (6.7% trap success). Overall trap success was 3.8% (ten skunks in 263 trap nights). In comparison, we captured ten individual skunks 14 times during 2,457 trap nights (0.57%) in 1992 (Crooks 1994a). The trap success in 1998 therefore was nearly seven times higher than the trap success in 1992. Trap success in the winter (6 captures/939 trap nights = 0.64%) and spring (6/605 = 0.99%) of 1992 was similar to that in April 1998. However, in contrast to September 1998, trapping skunks was exceptionally difficult in summer (0/336 = 0.00%) and fall (2/577 = 0.35%) of 1992.

The higher overall trap success in 1998 suggests a population increase of island spotted skunks on Santa Cruz Island. We must caution, however, that trap success only

provides an estimate of relative abundance and that we did not systematically survey the entire island for spotted skunks in either 1992 or 1998. Further, trapping design differed between years. Trap success was likely higher in 1998 because we placed traps at regular intervals along multiple transects throughout the island. In 1992, however, we heavily concentrated traps in smaller areas to capture skunks and foxes for a radio-telemetry study. In particular, in summer and fall 1992, trapping exclusively centered in two study areas to replace and remove radio-collars from study animals. Trap success therefore was lowered substantially because we had likely caught most skunks in each study area and recaptures proved difficult.

Nevertheless, the available data, although sparse, suggest a population increase in the past six years. Although trapping effort in 1998 was considerably less than in 1992, we caught the same number of individual skunks in both years. Further, although skunks were sighted only rarely on the island historically (Crooks 1994a), skunk sightings have recently increased markedly (L. Laughrin, pers. comm. 1998). An increase in the spotted skunk population on Santa Cruz Island may be driven by a combination of factors. For one, variable trap success may simply represent normal variation expected in any population. Skunk demography may also be influenced by environmental variables. Rainfall was exceptionally high on Santa Cruz Island in 1998, possibly stimulating an increase in reproduction and partially accounting for the higher trap success in September than in April 1998. Indeed, the western spotted skunk exhibits delayed implantation (Mead 1968), a reproductive mode that may allow skunks to increase fecundity in good years. The spotted skunk breeds in late September and early October, the blastocysts remain in a state of arrested development for approximately 200 days, the embryo is activated in March or April, and young are born from April to June.

Further, skunks may be slowly responding to recovery of the island. The removal of most sheep and cattle from the island in the 1980s, as well as the cessation of a prolonged drought, has stimulated a recovery of the island's plant communities. Unlike the island fox, which is relatively abundant and displays a wide range of resource use, the island spotted skunk is relatively rare and a resource specialist (Crooks 1994a,b; Crooks and Van Vuren 1994, 1995). Consequently, we predicted (Crooks and Van Vuren 1995) that although a generalist such as the island fox might initially respond more rapidly to island recovery, in the long-term skunks may benefit more as disturbed areas recover.

Lastly, resource overlap between skunks and foxes suggests some degree of interspecific competition between these two sympatric carnivores, and this competition likely affects skunks more than foxes (Crooks and Van Vuren 1995). For one, a generalist species such as the fox may have an advantage when its broad niche overlaps the narrow niche of a sympatric competitor such as the skunk. Also, the sheer numbers of foxes may magnify competitive effects on skunks. Interestingly, recent evidence suggests that island fox populations may be declining on the Channel Islands (Coonan et al. 1998). If so, a reduction in competition with foxes may benefit the island spotted skunk.

Even though skunks may be increasing on Santa Cruz Island, they are still relatively uncommon on the island, are particularly sensitive to environmental disturbances due to their relatively specialized resource use, and are restricted to only two California Channel Islands. Thus, the status of the island spotted skunk remains precarious. The island spotted skunk has been classified only as a subspecies of special concern by the State of California, perhaps in part because its status and ecology were completely unknown. We again recommend further monitoring of the population status of the island spotted skunk on both Santa Cruz and Santa Rosa islands and suggest that the skunk should be considered for reclassification as a threatened subspecies.

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