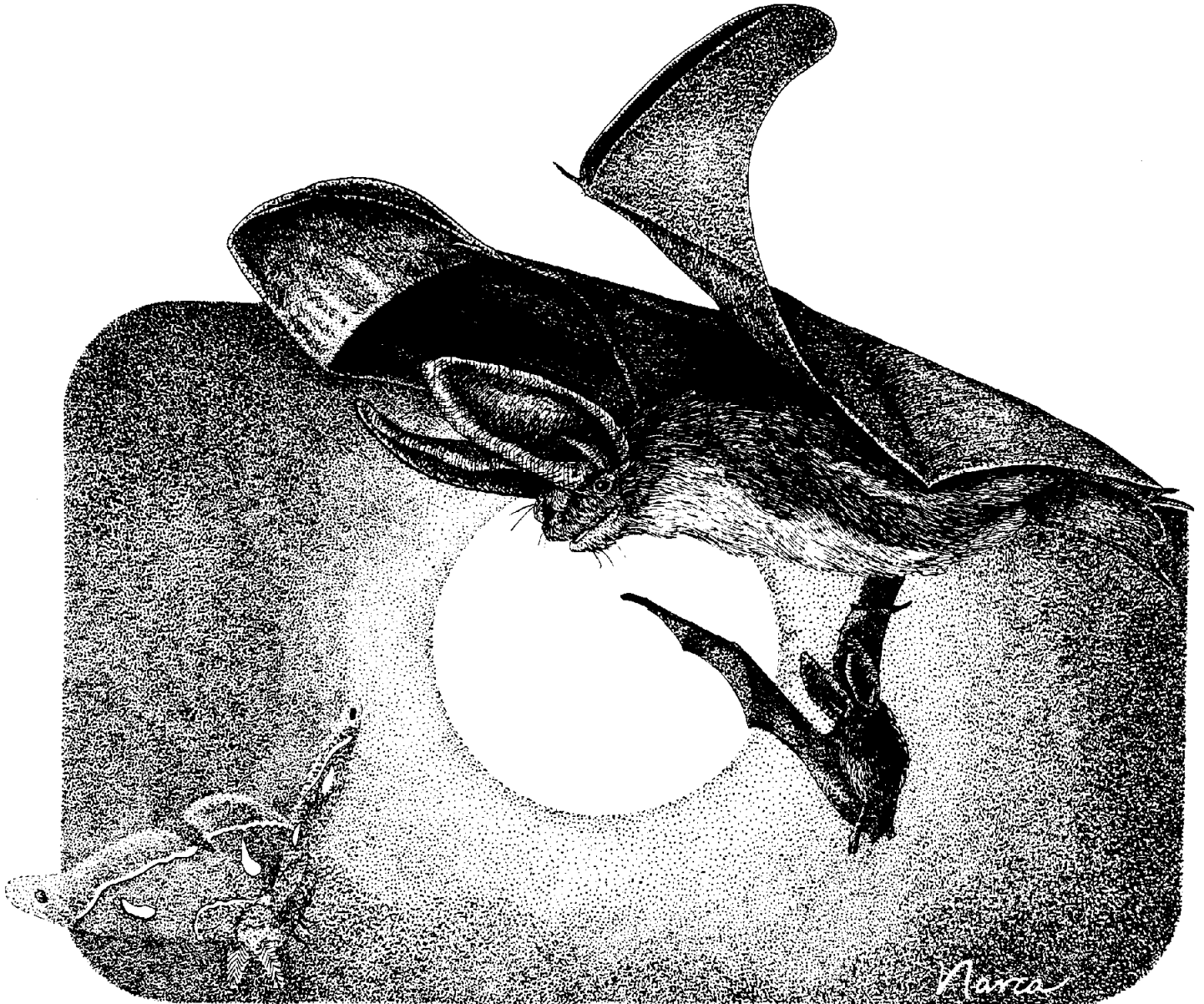


STATE OF CALIFORNIA  
THE RESOURCES AGENCY  
DEPARTMENT OF FISH AND GAME

MAMMALIAN SPECIES OF SPECIAL CONCERN IN CALIFORNIA

by

Daniel F. Williams  
Department of Biological Sciences  
California State University, Stanislaus  
Turlock, California 95380



Cover: Townsend's Big-eared Bat (Plecotus townsendii)

Page 11: Suisun Shrew (Sorex ornatus sinuosus)

Page 49: White-eared Pocket Mouse (Perognathus alticola)

Page 72: Mountain Beaver (Aplodontia rufa)  
Fisher (Martes pennanti)

Artwork by Narca Moore-Craig

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ABSTRACT

The native species of land mammals of California which currently do not have state or federal Threatened or Endangered Species status were investigated in order to identify those potentially threatened with extinction. Investigations concentrated on determining historic and current distributions, habitat associations, population status, and the nature and proximity of threats of extinction. Information was developed primarily from the literature, museum records, and field notes, and from contacts with biologists with knowledge of current developments in the field. Detailed studies were conducted in some areas, but only cursory field work was undertaken in other areas of concern. Populations of 36 species and subspecies were considered to be potentially jeopardized. These are placed in three priority categories. The 13 taxa in the Highest Priority face a high probability of extinction if current trends continue; the 11 taxa in the Second Priority are definitely declining in population size and appear jeopardized, but the threats are less immediate; the 12 taxa in the Third Priority appear not to face extinction soon, but their populations are declining seriously or they are otherwise highly vulnerable to human developments. Information on distribution, population status, habitat, and taxonomy, and recommendations for management actions are presented for each species on the List of Concern. Brief remarks are included for 56 other taxa considered in developing the final List of Concern.

Species limited to or primarily dependent upon riparian and wetland communities have been affected most severely by human developments. Five geographic areas of critical concern are: the Colorado River riparian corridor; the San Joaquin Valley lowlands, including grassland, riparian and wetland communities; the tidal marshes of the Los Angeles Basin; the tidal marshes of San Francisco and San Pablo bays; and the grasslands of the southern California coastal basins. Loss and fragmentation of mature and old-growth forests, lack of data on population structure of some game and fur-bearing species, and human disturbances of sensitive species are other important factors generating concerns for several species.

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## RECOMMENDATIONS

In addition to recommendations contained in the species accounts for the preservation of California's mammals, the California Department of Fish and Game and I recommend the following:

1. Give high priority to the preservation and/or restoration of plant communities essential to wildlife:
  - a. Restore and protect riparian forests and wetlands in California, with special attention to those of the Colorado River and the San Joaquin Valley.
  - b. Restore and protect tidal wetlands, especially those in San Francisco, San Pablo, and Suisun bays and those along the southern California coast in Ventura, Los Angeles, and Orange counties.
  - c. Preserve and protect native grasslands and desert shrub communities in the San Joaquin Valley, Salinas Valley, and the southern California coastal basins in Los Angeles, Orange, Riverside, and San Diego counties.
  - d. Preserve and protect mature and old-growth conifer forests in blocks large enough to support species such as Fishers.
2. Propose species on the List of Special Concern that meet the criteria of Threatened or Endangered Species to the California Fish and Game Commission and the U.S. Fish and Wildlife Service for addition to the lists of Threatened and Endangered Wildlife.
3. Initiate programs to determine the effects of hunting and trapping on game and furbearing species on the List of Special Concern and modify regulations as appropriate.
4. Encourage the protection of all species of bats in California and initiate an educational program to inform the public of the role of bats in control of insects and the sensitivity of bats to disturbance in maternity roosts and hibernacula. Support and assist the development of regulations prohibiting the poisoning or killing of bats as control measures in human structures.
5. Encourage governmental, educational, and conservation agencies and institutions involved in wildlife, land, and resource management to give high priority to Species of Special Concern in research programs and land and resource management decisions.
6. Encourage persons with information on Species of Special Concern or other species that may be threatened to bring the information to the attention of the Department of Fish and Game. Revise the List of Special concern every two years to reflect current information on distribution, population status, and management recommendations.

## PREFACE

The primary objectives in preparing this document were to identify taxa of mammals in California that had no status as Endangered, Threatened, or Fully-protected, but which appeared to be vulnerable to extinction, and to develop a set of priorities for determining their status and ensuring their survival. As originally conceived and implemented, the project provided no resources for field investigations, although most areas of the state were visited and limited field work was conducted. In the ensuing five years, however, opportunities to conduct more extensive field work in several areas have arisen and the investigations have resulted in removing several species from the draft List of Concern, moving others to lower categories, and elevating others to higher categories. Three species included on the final list were not investigated in the same detail as others, because in the early stages of the project I had decided there were no indications that they were in jeopardy. Subsequent to preparation of the draft final report, however, reconsideration of their status has resulted in their inclusion. I thought it better to include them with only partial data available rather than to delay the preparation of the final report.

A rough draft of the accounts of 52 species and subspecies to be included in this report was prepared and submitted for comment to the California Department of Fish and Game in 1981. A completed draft of the report was submitted later in 1981. The Department of Fish and Game finished its review and returned the draft to me for final revisions in June, 1984. By the time it was returned, considerable new information had been gathered for several species, and substantial revisions were envisioned; in addition, I had incurred a number of commitments that precluded work on the document until fall of 1985. In the interest of making the information that was gathered for the original report available, I have decided reluctantly to forego major revisions. Most sections of the report have been reorganized, 18 species have been deleted from the List of Concern (they are discussed in the section entitled "other candidate species"), three species have been added to the list of concern, and some new information, gathered during subsequent field work by me and others, has been incorporated.

23 February 1986  
Turlock, California

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American Badger  
Taxidea taxus

1778. Ursus taxus Schreber, Die Saugthiere. . . , 3:520. Type Locality:  
Labrador and Hudson Bay, Canada.  
1894. Taxidea taxus, Rhoads, Amer. Nat., 28:524.

Distribution: American Badgers occur from northern Alberta southward to central Mexico. They range from the Pacific Coast eastward through Ohio. They are absent from the humid coastal forests and from other regions with dense forests. In California, Badgers ranged throughout the state except for the humid coastal forests of northwestern California in Del Norte Co. and the northwestern portion of Humboldt Co. (Long 1973; unpubl. data).

Population Status: Badger populations have declined drastically in California within the last century (Grinnell et al., 1937; Longhurst, 1940). Grinnell et al. (1937) noted that Badgers were reduced in numbers over almost all of their range in California by 1937. At that time they were still numerous in the Central Valley, but now they survive only in low numbers in peripheral parts of the valley and adjacent lowlands to the west in eastern Monterey, San Benito and San Luis Obispo counties. In the coastal areas from Mendocino county south they have been drastically reduced in numbers. They have been extirpated from many areas in southern California. Long and Killingley (1983) regarded the status of Badgers in California as poor. Deliberate killing probably has been a major factor in the decline of Badger populations. Most people regard Badgers as detrimental to their interests and attempt to kill them. Cultivation is adverse to Badgers, as they do not survive on cultivated land. Agricultural and urban developments have been the primary causes of decline and extirpation of populations of Badgers in California. Rodent and predator poisoning pose double threats through direct and secondary poisoning of Badgers and elimination of the food Badgers are dependent upon. Shooting and trapping of Badgers for animal "control" is another source of mortality. The U.S. Fish and Wildlife Service took 4086 Badgers in California from 1966 to 1976 (Lee, 1977). Trapping of Badgers for the fur trade probably has had little impact on populations in many areas because the fur was of low economic value. In the late 1920's to at least the late 1930's, Badger fur was in high demand and trapping increased to levels that may have decimated local populations (Grinnell et al., 1937). Again, subsequent to 1975, demand for Badger pelts has increased and increased efforts are being expended to trap Badgers.

No current data exist on the status of Badger populations in California, but they have obviously declined or disappeared in large sections of the state, particularly areas west of the Cascade-Sierra Nevada mountain axis and in coastal basins of southern California. Badgers were common in mountainous areas only in large, treeless meadows and expanses near timberline. Longhurst (1940) noted that they had nearly disappeared from Napa County by 1940.

Despite the probable continuing decrease in numbers of Badgers statewide, reports of numbers trapped for the fur market indicate substantial increases in captures in recent years (e.g. 107 Badgers reported trapped in 1975-76 and 299 in 1976-77; California Dept. of Fish and Game, unpubl. report). Most of these Badgers were taken in the northern and eastern

counties, although Fresno and San Benito counties produced 45 and 20 respectively, in 1976-77. The increase in numbers trapped most likely reflects the increased prices paid for pelts and the consequently greater effort expended in trapping Badgers. For example, 931 trapping licenses were sold in 1975-76 and 1692 in 1976-77. Less than one-half of the licencees filed reports of their captures both years (207 and 751, respectively).

Habitat: In California, Badgers occupy a diversity of habitats. The principal requirements seem to be sufficient food, friable soils, and relatively open, uncultivated ground. Grasslands, savannas, and mountain meadows near timberline are preferred. Badgers prey primarily on burrowing rodents such as Gophers (Thomomys), Ground Squirrels (Spermophilus, Amospermophilus), Marmots (Marmota), and Kangaroo Rats (Dipodomys). They are predatory specialists on these rodents, although they will eat a variety of other animals, including mice, Woodrats, reptiles, birds and their eggs, bees and other insects, etc. Grinnell et al. (1937) recounted reports of Badgers breaking open bee hives to eat both the brood and honey. They regularly dig out nests of Bumble Bees.

One report of densities of Badgers reviewed by Long gave an estimated density of one Badger per square mile. Bailey (1905) noted that one Badger spent a summer in a 20-acre field. Sargent and Warner (1972) found that a radio-collared female had a home range of 850 hectares (2091 acres): 725 hectares (1783 acres) in summer, 53 hectares (130 acres) in fall, and 2 hectares (5 acres) in winter. Messick and Hornocker (1981) found that home ranges averaged 2.4 and 1.6 sq. km for adult males and females, respectively, in Idaho.

Recommendations: Current data on Badger populations are needed throughout the state, especially from the lowlands of western California. The effects of continuing habitat loss, rodent poisoning, and trapping for the fur trade should be assessed. Mandatory reporting of take (including animals discarded) by trappers and hunters should be required. Information on home range size and density of prey required by Badgers is needed for effective management. The impact on Badgers of the use of rodenticides and trapping for the fur trade should be assessed.

Remarks: Long (1972) revised Taxidea taxus primarily on the basis of specimens in the U.S. National Museum. While his paper has contributed much to an understanding of geographic variation in this species, it has also confused the taxonomy of Badger populations in California. T. t. jeffersonii (Harlan) generally ranges in the better-watered areas of California, including coastal areas, most of the Sierra Nevada, and most of the Great Basin Province. T. t. berlandieri Baird ranges through the hotter, drier desert and grassland associations of southeastern California and the Central Valley. This makes sense from an ecogeographic point of view: larger, darker-colored Badgers from cooler, moister areas and smaller, lighter-colored Badgers from hotter, drier areas. The problem occurred with the assignment of specimens to particular subspecies. A specimen from Alila (Earlimart), Tulare County, on the floor of the southern San Joaquin Valley, was assigned to jeffersonii, while another specimen from Alila was assigned to berlandieri.

Specimens from geographically adjacent and ecologically continuous areas



(hot and arid) of the San Joaquin Valley were assigned to jeffersonii (e.g. Tulare Lake, Huron, Stanley, Alcalde, and Taft), while others from Tracy, San Joaquin County, were assigned to berlandieri. These and other taxonomic assignments by Long (1972) make no sense from a geographic or environmental perspectives. Long (1972) noted that some of these specimens exhibit intermediate characters, suggesting intergradation. This is probably the case. I can see no compelling reason, however, to assign the Central Valley population to berlandieri. In fact, Long assigned most of the specimens from this region to jeffersonii, although his range map and statements lead to the opposite conclusion. A better arrangement would be to include all specimens from the Central California lowlands in T. t. jeffersonii. For this account, however, I do not use trinomials for Badger populations. The principal concern is for populations in the lowlands of western California, west of the main Cascade-Sierra Nevada mass and the southern California coastal region. This would include some populations that Long (1972) assigned to T. t. jeffersonii and some he called T. t. berlandieri.

Distribution Records: ALAMEDA CO.: Oakland, 2 mi NE Mills College, 1 (MVZ). BUTTE CO.: 18 mi W Oroville, 1 (CSUC). CONTRA COSTA CO.: Rattlesnake Canyon, near Orinda, 1 (MVZ). EL DORADO CO.: Echo, 7500 ft, 2 (MCZ). FRESNO CO.: Alcalde, 1 (USNM); 7 mi SW Coalinga, 1 (CAS); Huron, 374 ft, 1 (USNM); 0.6 mi NE Marion Lake, 10500 ft, Kings Canyon National Park, 1 (MVZ); Panoche Creek, 550 ft, 1 (MVZ). HUMBOLDT CO.: 27 mapped localities without locality descriptions, based on sight records (C. F. Yocum, in litt.). INYO CO.: no specific locality, 1 (LACM); Furnace Creek Ranch, 1 (MVZ); 3 mi NE Jackass Spring, 1 (MVZ); 7 mi E Laws, at Silver Creek, 1 (MVZ); Wild Rose Canyon, 1 (MVZ). IMPERIAL CO.: Alamo Duck Preserve, 8 mi NW Calipatria, 1 (MVZ); Bard, 1 (UCLA); 3 mi N Bard, 2 (SDSNH); 6 mi W Bard, 1 (SDSNH); 5 mi N Laguna Dam, 1 (MVZ); Manganese Wells, Lower Colorado River, 1 (MVZ); Palo Verde, 1 (LACM), 1 (MVZ); 0.75 mi N Palo Verde, 1 (MVZ); 13 mi N Palo Verde, 1 (MVZ); 18 mi WNW Palo Verde, 1 (MVZ); 20 mi N Picacho, Colorado River, 1 (MVZ); Silsbee, 1 (MVZ). KINGS CO.: Stanley, 1 (USNM). KERN CO.: Antelope Valley, near Neenach, 1 (FMNH); Bakersfield, 1 (MVZ); Buttonwillow, 1 (CAS); 3 mi S Cantil P. O., 1 (LACM); 3 mi SE Cantil, M & R Ranch, 1 (LACM); 3 mi ENE Hart's Place, 1 (LACM); 4 mi S Inyokern, 1 (LACM); 4 mi SW Inyokern, 1 (LACM); S Fork Kern River, 25 mi from Kernville, 1 (USNM); 5 mi NW Mojave, 3350 ft, 1 (MVZ); Tulare Lake, mouth of Kern River, 2 (USNM); Taft (Long, 1972); E side Walker Pass, 5000 ft, 1 (LACM); Willow Springs, 1 (AMNH). LAKE CO.: Lakeport, 1 (CAS); several miles N Upper Lake, 1 (WFBM). LASSEN CO.: Amedee, 1 (USNM); Calneva, 1 (MVZ); Hayden Hill, 1 (USNM); Karlo, 2 (MVZ); 2 mi S Madeline, 1 (HSU); Merrillville, 1 (USNM); 7 mi N Observation Peak, 5300 ft, 1 (MVZ); Poison Lake, 1 (USNM); 20 mi E Susanville, 1 (CSUC); 10 mi E Ravendale, 5400 ft, 1 (CAS); Susanville, 1 (USNM); Termo, 1 (MVZ); Willow Creek, Barran Ranch, 1 (CSUC). LOS ANGELES CO.: Covina, 1 (UCLA); Fairmont, Antelope Valley, 1 (LACM), 1 (MVZ); Los Angeles, 1 (LACM); near Lovejoy Buttes, 1 (MVZ); Tejunga Wash, 1 (MVZ). MADERA CO.: San Joaquin Experimental Range (Newman and Duncan, 1973); head San Joaquin River, 2 (USNM). MARIN CO.: Bear Valley Ranch, Olema, 1 (MVZ); Bolinas, 1 (MVZ); 0.75 mi from beach, 1.25 mi NW Bolinas, 1 (MVZ); Fort Barry, 1 (MVZ); 3 mi W Inverness, 2 (MVZ); Millerton Gulch, 2.25 mi NE Inverness, 1 (MVZ); 7 mi N Novato, 1 (MVZ); Tomales Point, 1 (MVZ). MARIPOSA CO.: no locality specified, 1 (USNM); Wawona, 1 (USNM). MENDOCINO CO.: Clarke Ranch, 8 mi SW

Earlimart], 283 ft, 6 (USNM); Otosi, 4 (USNM); 4 mi SW Porterville, 1 (AMNH); White River, 1 (CAS); Whitney Meadows, 9800 ft, 1 (MVZ). TUOLUMNE CO.: Tuolumne Meadows, 4 (MVZ), 1 (USNM). VENTURA CO.: Mount Pinos, 1 (MVZ); Mount Pinos, 5500 ft, 1 (LACM); Saticoy, 1 (MVZ). YOLO CO.: Davis, 1 (UDAV); Woodland, 1 (UDAV).

Channel Islands Spotted Skunk  
Spilogale gracilis amphiala

1929. Spilogale phenax amphialus Dickey, Proc. Biol. Soc. Washington, 42:158. Type Locality: 2.5 mi N ranch house near coast, Santa Rosa Island, Santa Barbara Co., California.
1933. Spilogale gracilis amphialus, Grinnell, Univ. California Publ. Zool., 40:105.

Distribution: Channel Islands Spotted Skunks are known to occur only on the islands of Santa Cruz, Santa Rosa and San Miquel. They are probably extinct on San Miquel Island, however (Walker, 1980).

Population Status: Nothing specific is known about the status of Spotted Skunks on the Channel Islands. Grinnell et al. (1937) noted that "quite a few" skins of these Skunks were received from Santa Cruz Island by Colburn's taxidermy shop in Los Angeles in 1918. Laughrin (1973) noted that Spotted Skunks were quite rare when he surveyed Santa Cruz Island in 1973. According to von Bloeker (1967), Spotted Skunks were once very common on Santa Cruz and Santa Rosa Islands, but by 1967 they were rarely found on either island, at least near human dwellings.

Remarks by these authors were subjective impressions; there have been no studies of population size on either island. The seeming rarity of Spotted Skunks may indicate normal population fluctuations, or reflect a real decline in numbers.

Santa Rosa and Santa Cruz are the two largest of the Channel Islands. Both are privately owned, and both have had less habitat alteration and fewer introductions of exotic mammals than most of the other islands. According to Laughrin (1973) Wapiti (Cervus elaphus), Mule Deer (Odocoileus hemionus), Wild Pigs (Sus scrofa), Cattle and Horses, occupied Santa Rosa Island in 1973 in addition to native mammals. Sheep formerly were present, but apparently have been completely removed. A list of currently extant, introduced species on Santa Cruz Island is unavailable. Von Bloeker (1967) mentioned Horses, Wild Pigs, Cattle, and Roe Deer (Capreolus capreolus) as being present, and implied that feral cats were established on both islands. Laughrin (1973) noted that Sheep also occurred on Santa Cruz Island, but fences were erected to restrict them to the north side. A hunting program to reduce their numbers was in effect at that time.

The principal reason for concern about the Channel Islands Spotted Skunk is the scanty information available suggesting a significant decline in populations. Because island biota are more prone to extinction than those of mainlands, concern is heightened. Human disturbances on the islands are probably not sufficient to cause this decline. Domestic cats and/or dogs have possibly introduced diseases to which the Skunks are