APPENDIX H
Biological Management Strategy

BIOLOGICAL MANAGEMENT STRATEGY

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1.0 INTRODUCTION

The study of wildlife species in recent times has become, of necessity, an effort to determine the impacts and results of human environmental development on animal populations. Along these lines, the study of the urban interface with undeveloped lands is becoming more important than ever.

The Sloan Canyon National Conservation Area (NCA) offers a unique opportunity to add data to the study of the effects of housing developments on several wild populations. As the surrounding communities of the City of Henderson and Boulder City continue to grow, several populations with extensive home ranges would experience the loss of some familiar habitats no longer available to them. The Bureau of Land Management (BLM) would research and monitor the health of these populations with the cooperation of universities and federal and State agencies. BLM would work cooperatively with the Nevada Department of Wildlife (NDOW), specifically on providing habitat for maintenance of population objectives and management activities designed to moderate populations (e.g., hunting, trapping, and transfer); and with the U.S. Department of Agriculture Animal and Plant Health Inspection Service/Wildlife Services in the management of wildlife (including Special Status and Sensitive Species, hunting, and trapping), recognizing respective management jurisdictions.

The goal of wildlife management for the Sloan Canyon NCA is to maintain and enhance native wildlife resources and provide for biological diversity of wildlife resources while ensuring healthy ecosystems. The objectives are—

- Manage to protect Special Status Wildlife Species and habitats in the NCA, including federally listed, State-sensitive, and Clark County Multiple Species Habitat Conservation Plan (MSHCP) species, according to existing law, regulation, policy, and/or agreement
- Maintain or enhance habitat quality and quantity to adequately support the life history requirements of a diversity of wildlife species
- Promote healthy and viable wildlife populations through appropriate habitat and species management actions that would lead to providing for ecological integrity within the NCA
- Protect important migratory bird habitat according to existing law, regulation, policy, and/or agreement.

The study of species addressed in this general management strategy may help maintain the ecological integrity and biodiversity of the NCA, may indicate through survey data when habitat is being fragmented, and can be used as a focal point for helping the public learn about and support conservation of natural resources in southern Nevada.

The species to be covered in this management plan would include those listed below. The desert tortoise (*Gopherus agassizii*) would be addressed through formal consultation with the U.S. Fish and Wildlife Service and therefore would not be considered in this management strategy.

Mammals

- Desert bighorn sheep (*Ovis Canadensis nelsoni*)
- Coyote (*Canis latrans)*
- Bobcat (*Felis rufus)*
- Grey fox (*Urocyon cinereoargenteus*)
- Kit fox (*Vulpes macrotis*)
- Cougar (mountain lion) (*Felis concolor*)
- Several species of small mammals (e.g., kangaroo rats [*Dipodomys* sp.]), desert wood rats (*Neotoma lepida*), pocket mice, grasshopper mice, and deer mice)
- Various species of bats (20 species of bats have been recorded in Clark County, Nevada).

The following bats are likely to be found in Sloan NCA:

- California leaf-nosed bat (*Macrotus californicus*)
- California myotis (*Myotis californicus*)
- Fringed myotis (*Myotis thysanodes*)
- Yuma myotis (*Myotis yamanensis*)
- Western pipistrelle (*Pipistrellus hesperus*)
- Big brown bat (*Eptesicus fuscus*)
- Spotted bat (*Euderma maculatum*)
- Pallid bat (*Antrozous pallidus*)
- Brazilian free-tailed bat (*Tadarida brasiliensis*)
- Big free-tailed bat (*Nyctinomops macrotis*).

Reptiles

- Western chuckwalla (*Sauromalus obesus*)
- Side-blotched lizard (*Uta stansburiana*)
- Western Whiptail (*Cnemidolphorus tigris*)
- Zebra-tailed lizard (*Callisaurus draconoides*)
- Desert spiny lizard (*Sceloporus magister*)
- Desert horned lizard (*Phrynosoma platyrhinos*)
- Collared lizard (*Crotaphytus insularis*)
- Desert iguana (*Dipsosaurus dorsalis*)
- Western banded gecko (*Coleonyx variegates*)
- Leopard lizard (*Gambelia wislizenii*)
- Gila monster (*Heloderma suspectum cinctum*)
- Coachwhip snake (*Masticophis flagellum*)
- Gopher snake (*Pituophis melanoleucus*)
- California kingsnake (*Lampropeltis getulus*)

- Mojave desert sidewinder rattlesnake (*Crotalus cerastes*)
- Mojave green rattlesnake (*C. scutulatus*)
- Southwestern speckled rattlesnake (*C. mitchellii pyrrhus*).

Amphibians

Red spotted toads *(Bufo punctatus*)

Birds—Resident Species

- Red-tailed hawk
- Prairie falcon
- Merlin
- Barn owl
- Great horned owl
- Common raven
- Verdin
- Screech owl.

Birds—Migratory Visitors

- Various hummingbirds
- Various warblers
- Swallow
- Oriole
- Eagle
- Peregrine falcon
- Rock Wren
- Burrowing owl
- Turkey Vulture.

2.0 BIOLOGICAL SURVEYS

This Biological Management Strategy for Sloan Canyon NCA identifies methods that may allow the collection of baseline data for addressing population numbers and ongoing efforts for determining long-term population trends.

An example of one important species in the NCA is the western chuckwalla described below. Two survey techniques for this species and their relative merits follow.

2.1 Western Chuckwalla (*Sauromalus obesus*)

The strictly herbivorous reptile diet of this species produces a scat of fibrose texture that is distinct in shape from other herbivorous reptiles. Chuckwalla scat varies in color from green (freshest) to brown to grey (oldest), is fibrose in texture, elongate and narrow in shape, measuring from about 15 mm (.6 in)

long by 3 mm wide (0.1 in) to about 70 mm (2.7 in) long by 10 mm (0.5 in) wide (B. Hardenbrook, pers. comm. 2005). Desert tortoise scat (although similar in appearance to chuckwalla scat) is larger in diameter and oval in shape, and most can be distinguished from chuckwalla scat. Generally, only scat of small tortoises may look exactly like small chuckwalla scat.

Chuckwallas were mostly observed between the hours of 10:30 to 15:30 (small sample size). Scat was observed at altitudes as high as 1,550 m (5,100 feet).

2.2 Survey Methods

One should be aware of climatic conditions: during a dry year, sightings would decrease because of food availability; sightings are expected to increase during a moist cycle.

Spotting Surveys (also known as "Visual Encounter Surveys" by NDOW; this method is not very effective). Spotting surveys are conducted by using scopes or binoculars to search for chuckwalla on rock outcrops. Surveys should be conducted when air temperatures do not exceed 40 degrees C (104 F). Surveys should be conducted during active season, i.e., mid-February to early June. During most years, mid-summer and winter surveys should be avoided. These surveys are conducted by several biologists, searching a small outcrop 2.5 to 7.5 acres for an hour or until a chuckwalla is seen, whichever comes first, then, moving to the next site.

Scat Surveys (this method is more effective). Scat surveys are conducted by several biologists who search an area less than 2.5 to 7.5 acres for 1 hour or until scat is located, whichever comes first. Surveys should be conducted using meandering transects to identify "valid chuckwalla scat" defined as generally at least 30 mm (1.2 inches) long and on rock outcrops where tortoises typically would not climb. The surface of rock should be recorded to determine if it is smooth or cracked, which would stop and trap scat.

2.3 Additional Survey Methods To Be Considered

Night Reptile Surveys. The roadless characteristic of Sloan NCA makes nocturnal surveys for reptiles difficult and more expensive than for roaded areas (e.g., Redrock Canyon NCA). The majority of reptile species surveys would need to be similar to these suggested for western chuckwalla.

Anabat Technology. It would be especially important to identify members of the bat community in Sloan NCA with the surveys using Anabat technology. This technology is used to detect the auditory signatures of bat species while feeding and to record the data on an associated computer.

Nesting Raptors. Surveys for nesting hawks can be conducted on foot or by helicopter. Surveys for burrowing owls include searching for adult owls with young when actively hunting for prey and searching for burrows because burrowing owls often use unoccupied desert tortoise burrows for shelter and nesting in season. Regular visits to cliff areas would reveal the presence of kestrels and great horned owls.

Mammal Surveys. NDOW would survey desert bighorn sheep according to the statewide protocol. NDOW, with the cooperation of BLM staff, would conduct the translocation of bighorn sheep on an as-needed basis.

One technique that can help determine the presence of mammalian predators (e.g., kit fox, gray fox, ringtails, bobcat, cougar, and coyote) is to place remote sensing camera arrays (camera traps) in the NCA. Scat and track surveys can be conducted for all the mammal species listed. Nocturnal spotlight surveys

can be used by personnel on foot in the NCA for most mammals. It is also possible to use trained dogs to help locate scats, kit fox dens, and fox use areas (although this method requires extensive training of the dogs employed). Kit fox should be in the vicinity of the water project because of the abundance of quail and other birds and insects.

Avian Surveys. In 2004, BLM personnel in the Sloan Canyon Area of Critical Environmental Concern, in cooperation with Great Basin Bird Observatory, conducted a point count survey of birds. This type of survey should be continued within the Petroglyph Management Area and expanded to other NCA areas during the breeding season to gather annual data about presence and density of nesting species.

The known nest sites of hawks, owls, and eagles (when located) should be visited and surveyed annually. At the time of this document's preparation, nesting owls were suspected in the NCA. Kestrel nest-sites and red-tailed hawk nests have been documented.

Winter surveys of the NCA would determine the extent and variety of the species using the habitat annually or periodically. NDOW indicates that Sloan Canyon is an important winter area for Merlin falcons. The importance of the Colorado River and its reservoirs for California condor and for bald and golden eagles indicates that Sloan may occasionally become usable habitat for these species but would not likely be used regularly.

Marking individual birds can be helpful in determining home range and seasonal use of a habitat by numerous species. Mist nets are a standard method for capturing birds for banding and other marking studies. Such studies may be warranted if general monitoring techniques indicate severe population changes.

3.0 PLANTS

The Blue Diamond cholla is a Nevada State plant species of concern found in limited areas of Sloan Canyon NCA. Any developments, facilities, and trails in the NCA must be sensitive to the distribution of this plant in the NCA. Any disturbance of this species would require BLM permitting.

Several penstemon species are BLM sensitive and may be found in the various washes in the NCA. Steps should be taken to mitigate fragmentation of these populations when developments, facilities, and trail construction take place in the NCA.

4.0 INVERTEBRATES

Little is recorded about the insects and other invertebrate species native to Sloan Canyon NCA. The actual community of these species is likely to be much larger and more diverse than is suggested by the following list. These representatives have been recorded in the NCA by various observers: desert cockroach (*Arenivaga sp.*), various flies of the order Diptera, pallid-winged grasshoppers (*Trimerotropis pallidipennis*), mud dauber wasp (*Sceliphron caementarium*), pepsis wasp or tarantula hawk (*Pepsis sp.*), velvet ant (*Dasymutilla gloriosa*), harvester ant (*Pogonomyrmex sp.*), funnel web spider (*Agelenopsis sp.*), orb weaver of the family Araneidae, desert recluse spider (*Loxosceles deserta*), black widow spider (*Latrodectus hesperus*), tarantula (*Aphonopelma sp.*), centipede (*Scolopendra sp.*), devil scorpion (*Vaejovis confuses*), giant desert scorpion (*Hadrusus spadix*), pinacate beetle (*Eleodes sp.*), honey bee (*Apis sp.*), and various moths and butterflies of the order Lepidoptera. The information about invertebrates is based on studies by Alex L Heindl of the University of Nevada, Las Vegas.

Various standard entomological survey techniques can be used to determine a baseline level for invertebrates in Sloan Canyon NCA: net sweeps, attracting specimens to nocturnal light traps, and other methods for specific conditions.

5.0 BIOLOGICAL SURVEY EXAMPLE

The following documents an example of a one-half day survey conducted in the Sloan Canyon NCA:

June 28, 2004, 7:00 a.m. until about noon

Bird Observations

Rock wren—several pairs, individual adults and young of the year.

- Black-throated sparrow
- Horned lark
- Gambel quail
- Common raven
- Young of year redtail hawk, possible prairie falcon
- Ash-throated flycatcher
- Say's phoebe (no swallows or swifts seen).

Mammals

- Antelope ground squirrels—a common sighting
- Nelson's desert bighorn sheep—tracks and droppings seen often in upper reaches of canyon and near the big game water project. Bones found were likely those of a young male desert bighorn (e.g., hip girdle, ribs, shoulder blade, no skull found)
- Bobcat droppings seen on four to six locations in the washes
- Cougar droppings seen twice
- Coyote tracks and droppings seen in many parts of the canyon
- No obvious droppings or tracks of any foxes.

Reptiles

The contractor saw adult and hatchling desert tortoise in Sloan Canyon NCA, but we did not find tortoise or sign on this date. We did not see Gila monster or sign during this visit.

We did not see any snakes during this visit. Although it was 89 degrees to a high of about 94 degrees while we were in the NCA, there was a very pleasant and strong wind blowing to help cool us as we worked. We looked diligently for chuckwalla in the normal locations, but we did not see even one. We did see the following lizards:

- Uta—side-blotched lizard—saw 8 to 11 (most common reptile in Sloan NCA)
- Leopard lizard—saw two individuals
- Desert Iguana—one or two seen

- Whiptailed lizard—a common sighting (about seven seen)
- Desert horned lizard—one seen, captured, and released
- Ants (the principal food for horned lizards)—seemed abundant in upper reaches of canyon
- Collared lizard—one very colorful specimen on a cliff above the water project
- Spiny desert lizard—one seen. We did not find any amphibians.