BIOLOGICAL OPINION FOR
THE ISSUANCE OF AN ENHANCEMENT OF SURVIVAL
TAKE PERMIT FOR
NORTHERN IDAHO GROUND SQUIRREL
(*Spermophilus brunneus brunneus*)
ASSOCIATED WITH A SAFE HARBOR AGREEMENT
FOR THE OX RANCH, INCORPORATED IN
ADAMS COUNTY, IDAHO

14420-2009-F-0457

JUNE 2009
FISH AND WILDLIFE SERVICE
IDAHO FISH AND WILDLIFE OFFICE
BOISE, IDAHO

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INTRODUCTION

This document is the Fish and Wildlife Service's (Service's) Biological Opinion (Opinion) of the effects on northern Idaho ground squirrel (NIDGS, *Spermophilus brunneus brunneus*) from the approval of a Safe Harbor Agreement (SHA) and authorization of incidental take for a parcel of private property in Adams County, Idaho. The SHA will allow for management and conservation of the threatened NIDGS on approximately 7,783 acres (ac) of private land owned by the OX Ranch (Cooperator) just north of Bear, Idaho. Northern Idaho ground squirrels currently occupy approximately 610 ac of the 7,783-ac area. The SHA allows the Cooperator to carry out a variety of conservation measures within the 610 ac of occupied habitat (baseline), and within a larger 4,227-ac Squirrel Management Area (SMA) to benefit NIDGS.

The Service has determined there may be an adverse effect to northern Idaho ground squirrel (NIDGS) as a result of implementation of the proposed action. As such, consultation under section 7 of the Endangered Species Act of 1973, as amended (Act) is required. In this Opinion, we have considered the effects of the proposed action, along with cumulative effects, and conclude that the proposed action is not likely to jeopardize the continued existence of the NIDGS. We also considered effects to all listed species within Adams County, which is where the proposed action would occur. Those species include: gray wolf (*Canis lupus*), Canada lynx (*Lynx canadensis*), northern Idaho ground squirrel (*Spermophilus brunneus brunneus*), steelhead (*Oncorhynchus mykiss*), spring/summer chinook salmon (*Oncorhynchus tshawytscha*), fall chinook salmon (*Oncorhynchus mykiss*), and bull trout (*Salvelinus confluentus*). We have concluded that the proposed action will not affect any listed species other than NIDGS; the effects of the action on NIDGS are evaluated within this Opinion.

CONSULTATION HISTORY

The following correspondence and meetings have occurred between the OX Ranch (Cooperator) and the Service prior to the issuance of this Opinion. A complete record of this consultation is on file at the Service's Idaho Fish and Wildlife Office in Boise, Idaho.

2006-2008	Multiple meetings between the Service, Idaho Department of Fish and Game (IDFG), and the Cooperators to develop the draft SHA.
November 24, 2008	Federal fish and wildlife permit application form for an enhancement of survival incidental take permit associated with a Safe Harbor Agreement signed and submitted by the Cooperator.
January 26, 2009	Opening of the 30-day public comment period for the proposed SHA, enhancement of survival permit application, and draft Environmental Action Statement.
February 2009	Consideration of public comments and appropriate changes to documents made.
March-May 2009	Revised SHA provided to OX Ranch, additional negotiations and changes made to SHA.

May 12, 2009	Final SHA provided to OX Ranch for review and comment.
June 24, 2009	OX Ranch approves May 12, 2009 version of the SHA.

BIOLOGICAL OPINION

I. Description of the Proposed Action

A. Action Area

The action area is defined in regulations implementing section 7 of the Act (50 CFR 402.02) as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action."

The OX Ranch is just north of the town of Bear, Idaho, in Adams County, and includes approximately 14,805 ac. The parcels enrolled under the SHA total 7,784 ac of privately owned lands, ranging in elevation from approximately 4,000 to 4,600 feet. Table 1 shows the cover types that currently occur within the action area (USGS 2002).

Table 1. Cover types on the OX Ranch

GAP Cover Type	Acres
Agricultural Land	433
Basin and Wyoming Big Sagebrush	6
Bitterbrush	1014
Disturbed	72
Douglas-fir	36
Foothills Grassland	266
Low Sagebrush	2354
Mixed Xeric Forest	437
Montane Parkland, Subalpine Meadow	22
Mountain Big Sagebrush	881
Perennial Grass Slope	476
Perennial Grassland	46
Ponderosa Pine	1182
Shrub Dominated Riparian	469
Warm Mesic Shrubs	90
Total	7,784

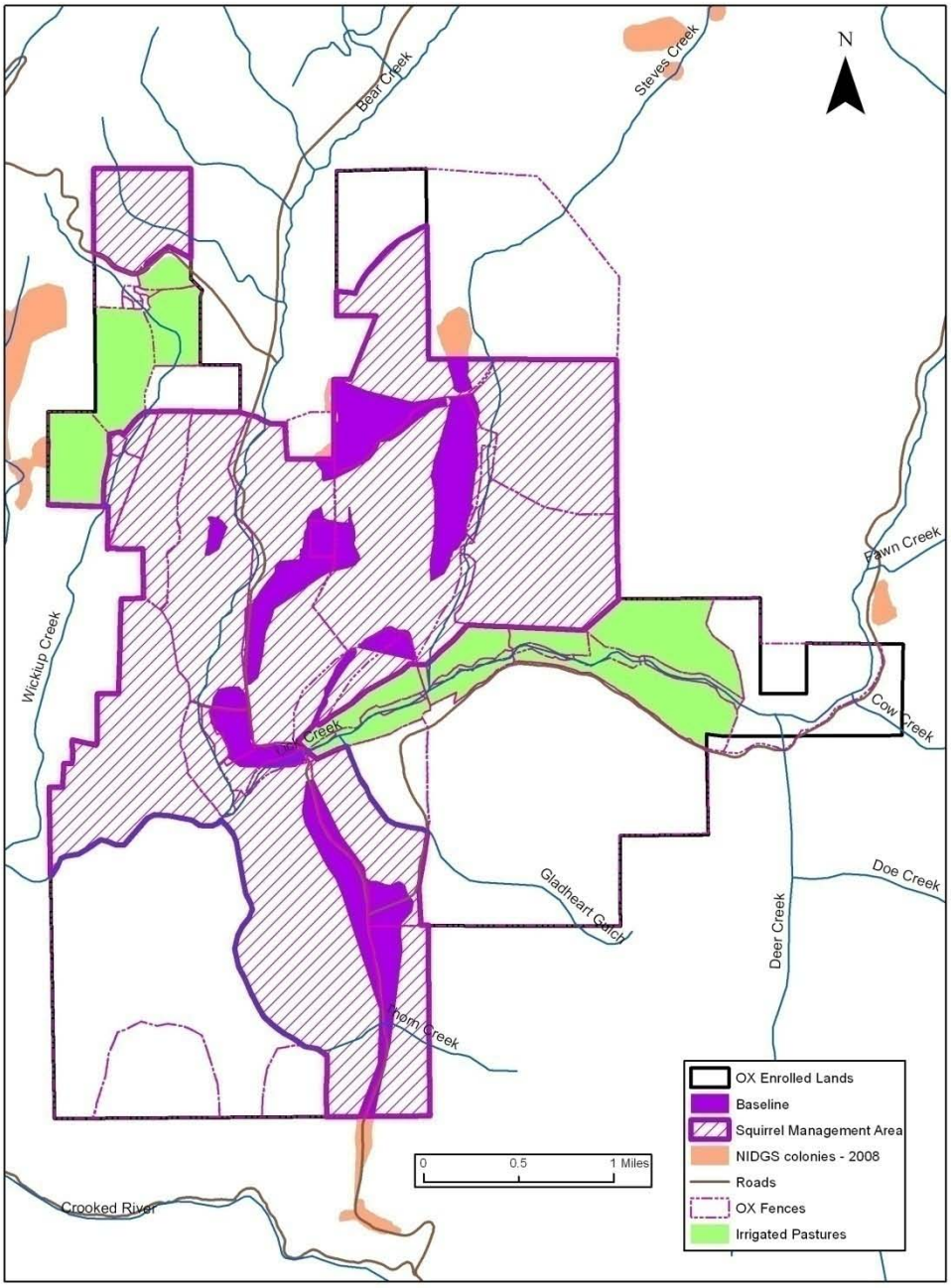
It is generally open country, with scattered stands of mixed conifers, primarily Ponderosa pine (*Pinus ponderosa*) and Douglas-fir (*Pseudotsuga menziessii*). Approximately one-half of this area includes lower elevation areas where there are no currently documented northern Idaho ground squirrel colonies. Existing colonies of NIDGS within the OX Ranch are located only within 610 ac of the 7,784 ac parcel generally south of Bear and along Lick Creek, Bear Creek, and Steve's Creek (see Figure 1).

B. Proposed Action

The proposed action is for the Service to approve an SHA and issue an Enhancement of Survival permit to the Cooperators for incidental take of NIDGS. The Cooperators would implement conservation measures on their land as identified in the SHA, and would receive incidental take authorization for certain management and conservation activities on the 7,784 ac of enrolled lands (hereinafter referred to as "OX Ranch"). The permit would be issued in accordance with section 10(a)(1)(A) of the Act and the Service's SHA final policy (64 FR 32717) and final regulations (64 FR 32706, 69 FR 24084).

The SHA would support efforts to conserve NIDGS. Conservation measures would be implemented by the Cooperator, IDFG, and the Service, and would consist of monitoring NIDGS populations, research on NIDGS populations, and would potentially include conducting timber management activities to increase the amount of available suitable habitat for NIDGS.

Figure 1. Baseline and Squirrel Management Areas within the Enrolled Lands of the OX Ranch Safe Harbor Agreement



Safe Harbor Agreement Baseline Determination

In addition to the above use and management activities, the SHA identifies a baseline amount of habitat for NIDGS that the Cooperator will maintain throughout the term of the SHA (Figure 1). The SHA identifies 610 ac of baseline habitat within the enrolled lands (NNRG and Service 2008). The baseline habitat includes those lands where colonies currently exist.

It is expected that the amount of habitat in the baseline should support a minimum of 315 to 600 individual squirrels (Evans Mack, IDFG, pers. comm. 2009). While these specific population numbers are not considered part of the baseline, the IDFG and Service will continue to monitor the species within the enrolled lands; any abnormal changes which might indicate unanticipated circumstances or effects of land use will be noted and may be addressed.

In addition to identifying baseline habitat, the SHA identifies the 4,227 ac SMA. The SMA includes all 610 ac of the baseline, as well as an additional area of 3,617 ac. The additional SMA area was calculated by adding a buffer of 786.5m around the outer boundaries of the occupied colony sites. A recent study of southern Idaho ground squirrel dispersal reported 786.5m as the average dispersal distance (Panek 2005). Because similar information is lacking on NIDGS and southern Idaho ground squirrels are the most closely related subspecies, such approach appears valid. In addition, boundaries were either expanded from the 786.5m buffer or contracted to account for suitable habitat and identifiable on-the-ground features.

For the purposes of this Agreement, suitable habitat for NIDGS is defined as sparsely treed sites on east, southeast, south, or southwest aspects with moderate slope. Vegetation is variable, but typically includes shrubs for cover and a variety of forbs and grasses for food. Vegetation cover is moderate, with open ground visible among the plants. Sites often have a mix of shallow, rocky soils interspersed with deeper soils. Where shrub cover is lacking, natural features such as large rocks and logs or man-made features such as rock jacks may provide cover for burrows and predator avoidance. Sites may occur at the edge of mixed conifer forests or on open slopes and ridge tops, and have minimal potential for interactions between NIDGS and Columbian ground squirrels (Evans Mack, pers. comm. 2009).

It was necessary to identify both a baseline and a SMA for the SHA to ensure that the conservation needs of the NIDGS are fully addressed, and to ensure that the Cooperator is able to easily identify the location of areas of concern for NIDGS on-the-ground while implementing various management activities and conservation measures. Because the SMA was delineated to be identifiable on-the-ground, its boundaries are defined by physical features such as roads, fences, streams, or property boundaries. The SMA is distinguished from other "enrolled lands" by soils, vegetation, slope, and aspect that constitute potentially suitable habitat, or that fall within the 786.5m buffer around currently occupied sites (Baseline).

Within the boundaries of the SMA as described in Appendix D of the SHA, the Cooperator will maintain the habitat by implementing management actions and conservation measures as described below. The SHA requires that any new or newly discovered colonies outside the SMA be delineated, added to the SMA, and maintained for the remaining duration of the SHA. However, new or additional NIDGS-occupied areas discovered after completion of the SHA will not be added to the baseline.

Ranch Management

Ranch management activities may occur across the enrolled lands. Additional conservation measures associated with certain management activities may be applied within SMA habitat; these are described below in section 3 (Conservation Measures). The ranch management practices covered in the SHA are related to livestock management, recreation, and timber management activities, and include the following uses.

a. General Occupation and Use

The OX Ranch is occupied by several families involved in operating the ranch. The SHA includes a number of activities or uses that result from this general occupation and use, including the presence of pets, and the use of driveways and outbuildings. The SHA also includes provisions related to fire management and use of rodenticides. Each of these activities or uses is briefly described below.

As part of general occupation of the enrolled lands, the presence of pets and use of driveways and areas within 200 feet of existing homes and outbuildings are expected. In addition, some construction of new buildings or remodeling of existing structures is likely to occur during the period of the SHA. Such construction or remodeling would result in the improvement or construction of new sewer, water, or electrical service to buildings and residences and road construction and maintenance.

The SHA restricts the Cooperator's use of rodenticides to within 100 feet of existing structures. Consistent with Regional Service policy (per July 27, 1998, Regional Memorandum), incidental take of NIDGS as a result of any pesticide use would not be authorized under the permit

b. Livestock Production

The OX Ranch is a working cattle ranch. Approximately 1,000 cow/calf pairs, 250 replacement heifers or dry cows and 45 bulls graze from March to December within the portion of the ranch covered by this SHA. In addition, the ranch supports 30 horses for approximately 9 months. Approximately 432 ac are used as irrigated pastures and are grazed during the spring and summer months. The land is fenced into a number of pastures, with an accompanying rest/rotation system for grazing. Appendix B of the SHA includes seasons of use and stocking levels for the various pastures (NNRG and Service 2008).

Livestock husbandry includes many other aspects in addition to grazing, including construction or maintenance of fences, corrals and areas where livestock are concentrated for winter feeding; branding; calving; non-chemical actions to prevent or control diseases or pests including parasites and insects that disturb livestock or cause diseases in them; and disposal of dead animals.

In addition to livestock operations, a number of farming operations are conducted on the OX Ranch to support the livestock production. Such activities currently include field irrigation which currently occurs within the area occupied by the "Squirrel Manor" population of NIDGS. This practice has been in place for a number of years, and does not appear to adversely affect the Squirrel Manor NIDGS population (see Mack Evans 2006; Mack Evans and Bond 2008).

Future activities envisioned by NNRG and the Cooperator that may occur within the duration of the SHA include cultivation and crop harvesting (limited to possible hay production); cultivation and reseeding of pastures including occasional disking or harrowing; brush clearance and weed control by mechanical means; and non-chemical management of such pests as crop destroying insects, unwanted vegetation, and small animals for which control is not regulated by state agencies. While ongoing cultivation and reseeding of pastures and associated farming activities (discing, etc.) will continue under the SHA, previously uncultivated pastures will not be converted or cultivated within the SMA during the SHA.

c. Recreation

The OX Ranch operation includes recreational activities for guests who stay at the Seven Devils Lodge or in various guest houses, including snowmobiling in the winter, summer trail rides and hikes, fishing and guided hunts during appropriate seasons. This is a growing component of the OX Ranch's operation, and is described separately from general occupation and use to allow us to clearly analyze the effects of the added level of human disturbance.

As part of the recreation component of the SHA, the Cooperator agreed to work with the Service and IDFG to enforce the existing prohibitions against shooting NIDGS, and if appropriate, work with the agencies to develop and install signs to discourage shooting of NIDGS. Although state and Federal prohibitions against shooting NIDGS are currently in place, public knowledge of these prohibitions is lacking and enforcement of the prohibitions is challenging and imperfect.

d. Timber Management

Timber is occasionally harvested on the OX Ranch; management activities are guided by a long-term timber management plan (See Appendix A of the SHA). The timber management plan calls for numerous logging operations and silvicultural treatments to maximize timber values on the property. Specific timber harvest activities include tree thinning and felling; log transport; construction of temporary roads and skid trails; slash disposal through burning; prescribed fire; reforestation; tree planting and other silvicultural treatments.

The Cooperator will annually meet with the Agencies to review their timber management plan and to coordinate ranch timber activities with NIDGS management needs as described below under Conservation Measures.

Conservation Measures

The SHA includes eight primary conservation measures that are briefly summarized here. Please see the SHA (NNRG and Service 2009) for additional detail on these measures. These conservation measures are part of the proposed action.

a. Timber Management: The Cooperator agreed to implement one of two activities: (1) a minimum of 15 ac of habitat enhancement measures specifically designed to benefit NIDGS, or (2) work with the Agencies to identify enrolled lands that could be used to study the efficacy of habitat improvements designed to benefit NIDGS (see NNRG and Service 2009 for additional details). Either action is anticipated to benefit NIDGS by increasing the amount of suitable habitat within the enrolled lands.

   In addition to habitat enhancement, the Cooperator agreed to implement measures to avoid impacts to NIDGS by implementing logging operations during the winter months of December through March (provided the ground is frozen). The Cooperator further agrees to lop and scatter slash to minimize concentrated slash burns, restrict burning in occupied NIDGS habitat to after August 15 and prior to reemergence of NIDGS in the spring, and to avoid log hauling through occupied habitats when NIDGS are active above ground. If logs must be hauled through occupied habitats when NIDGS are active and above ground, the Cooperator agreed to work with drivers and equipment operators to reduce operation speed to reduce potential impacts to NIDGS.

b. Farming Operations: The Cooperator agreed to maintain ongoing cultivation and reseeding of pastures, and associated farming activities (discing, etc.). These pastures will not be cultivated for the purposes of converting them to cover types or crops that are inconsistent with the historic perennial grass and forb cover types that typify the current Squirrel Management Area.
c. Research and Monitoring: The Cooperator will continue to allow access by researchers affiliated with the Agencies to conduct research studies investigating habitat conditions; ground squirrel life cycles and biology; translocation; impacts of human activities, and vegetative control. This conservation measure is anticipated to benefit NIDGS by allowing the agencies access to the enrolled lands to conduct studies on NIDGS life history, and to allow translocation and supplementation, if necessary, to sustain NIDGS populations outside the OX Ranch.
d. Rodent Control: The Cooperator agreed to refrain from conducting chemical rodent control within the squirrel management area, with the exception of within 100 foot (30.5 m) radius of any home or building within the squirrel management area. If a rodenticide (Fumitoxin®) will be used within 100 feet

of a home or building, and near an occupied NIDGS site, the Cooperator will work collaboratively with the Agencies to develop specific application procedures designed to avoid harm to NIDGS. Minimum procedures are outlined in the SHA.

e. Habitat Enhancement, Agency Access, and Notification of Activities Likely to Take Squirrels: The Cooperator agreed to allow the Agencies access to the enrolled lands throughout the term of the SHA to conduct activities related to NIDGS conservation and to otherwise implement the SHA. These activities may include, but are not limited to: seeding of desirable ground squirrel native food plants, prescribed burning, artificial feeding, and other ground squirrel habitat maintenance activities which are completed. In addition, the Cooperator agreed to notify the Agencies 15 business days prior to any planned activity that is reasonably likely to result in take of NIDGS on the enrolled property and provide the agencies access to the area of the planned activity to capture and/or relocate any potentially affected NIDGS, if appropriate. This conservation measure is anticipated to benefit NIDGS by facilitating agency implementation of conservation actions and by reducing the level of incidental take of NIDGS.

f. Outreach: The Cooperator agreed to inform guests of the OX Ranch of the existence of NIDGS, their protected status and the measures that guests shall take to minimize any negative impact they might have on the species. The Cooperator also agreed to cooperate with the Agencies in the development and distribution of written information regarding NIDGS and make such information available to guests and employees of the Ranch. This conservation measure is anticipated to benefit NIDGS by increasing the level of awareness that guests and the general public have of the threats to, and status of NIDGS. Such awareness should reduce accidental take of the species.

g. Shooting Prohibition: See Section I.B.2.C.

h. Predator/Competitor Control: The Cooperator agreed to notify the Agencies if badger activity or new or substantial increases in Columbia ground squirrel activity is noticed in NIDGS colonies. The Agencies agreed to work with the Cooperator to determine when predator/competitor control is appropriate, and implement remedial actions when necessary. This conservation measure includes trapping and removal of Columbian ground squirrels and badgers from NIDGS occupied areas. This conservation measure is anticipated to benefit NIDGS by reducing the amount of direct mortality due to (1) predation by badgers, and (2) competition from Columbian ground squirrels. Without such a measure, otherwise natural levels of predation/competition may result in the extirpation of small NIDGS populations within the enrolled lands.

i. Supplemental Feeding: Supplemental feeding of the Squirrel Manor population currently occurs on a voluntary basis and is undertaken by a ranch employee. Although none of the parties agreed to assume responsibility for continuing the existing supplemental feeding of the Squirrel Manor population, the Cooperator agreed to notify the Agencies if it is aware that supplemental feeding activities may cease.

II. Status of the Species

A. Legal Status

The northern Idaho ground squirrel (NIDGS) was listed as threatened under the Act on April 5, 2000 (65 Federal Register 17,779-17,786). On July 28, 2003, the Service approved a Recovery Plan for this species (Service 2003) that provides direction for recovery of the species, including population sizes and criteria for a minimum number of viable metapopulations.

The Recovery Plan identifies 12 existing and potential metapopulation sites. The exact boundaries of these sites are considered somewhat fluid and will be revised as new surveys, habitat, and population information becomes available. The metapopulation sites include lands administered by the U.S. Forest Service, the Idaho Department of Lands, and private landowners. To date, one Habitat Conservation Plan and one Safe Harbor Agreement with private landowners for this species have been completed (Service 2006 and 2007).

B. Species Description

The northern Idaho ground squirrel (NIDGS) belongs to the small-eared group of true ground squirrels. Yensen (1991) described the NIDGS as taxonomically distinct from the southern Idaho subspecies (*Spermophilus brunneus endemicus*) based on morphology, fur, and apparent life-history differences, including biogeographical evidence of separation. The NIDGS occurs only in west-central Idaho in Adams and Valley Counties. It has a reddish brown back with faint light spots and a cream-colored belly. The back of the legs, top of the nose, and underside of the base of the tail are all reddish brown. Ear pinnae project slightly above the crown of the head (Yensen and Sherman 2003). The NIDGS can be distinguished from the other subspecies, the southern Idaho ground squirrel, and other small-eared ground squirrels, by its smaller size and rustier fur color.

Recent work suggests that southern Idaho ground squirrels may be descended from NIDGS, and the NIDGS population in Round Valley may be the common link between the two subspecies (Hoisington 2007). Hoisington (2007) used the cohesion species concept to test whether genetic and ecological data support species level classification of the two subspecies of Idaho ground squirrel. Her results support not only the subspecies distinction, but also support raising the two subspecies to species status.

C. Life History

The northern Idaho ground squirrel (NIDGS) occupies dry (or xeric) meadows surrounded by ponderosa pine or Douglas-fir (*Pseudotsuga menziesii*) Forests (Yensen 1991). Xeric meadows have shallow soils (Dyni and Yensen 1996). However NIDGS sites need to be deep enough to accommodate nest burrows greater than 3.3 feet deep (Yensen et al. 1991, Yensen and Sherman 1997); dry vegetation sites with shallow soils of less than 19.5 inches depth above bedrock are used for auxiliary burrow systems (Yensen et al. 1991). NIDGS often dig burrows under logs, rocks, or other objects.

Although Columbian ground squirrels overlap in distribution with the NIDGS (Dyni and Yensen 1996), Columbian ground squirrels prefer moister areas with deeper soils. Sherman and Yensen (1994) reported that the segregation of the two species is due to competitive exclusion as opposed to differing habitat requirements.

The NIDGS emerges in late March or early April and is active above ground late August (Yensen 1991). Emergence during this period begins with adult males, followed by adult females, and then yearlings. The NIDGS becomes reproductively active within the first two weeks of emergence (Yensen 1991). Females and males are sexually mature the first spring after birth. Females produce one litter per year of between two and seven pups, depending on fitness. Males and females do not live together or near their mates, and females do not cooperate with close kin to defend burrows or rear young (Sherman and Yensen 1997).

Females that survive the first winter live, on average, nearly twice as long as males (3.2 years for females and 1.7 years for males). Estimates of maximum longevity indicate that males may live up to 5 years and females up to or greater than 7 years (Sherman and Runge 2002). Males normally die at a younger age than females, typically from mortality associated with reproductive behavior. During the mating period, males move considerable distances in search of receptive females and often fight with other males for copulations, thereby exposing themselves to predation by raptors such as prairie falcons (*Falco mexicanus*), goshawks (*Accipiter gentilis*), and red-tailed hawks (*Buteo jamaicensis*). Significantly more males die or disappear during the two week mating period than during the rest of the 12 to 14 week period of above-ground activity (Sherman and Yensen 1994). Seasonal torpor or hibernation generally occurs in early to mid-July for adult males and females, and late July to early August for juveniles (Sherman and Yensen 1997).

D. Population Dynamics

As a result of the factors described in the Life History section, and due to the small sizes of the remaining population sites, the northern Idaho ground squirrel (NIDGS) may have little resilience to naturally occurring events. Small populations are often vulnerable to climatic fluctuations and catastrophic events (Mangel and Tier 1994). In 1993, Gavin et al. (1999) developed a population viability simulation program using recruitment and death values recorded over eight years from an intensively studied NIDGS population site. This model determined that all but 1 of 100 population sites could become extinct in

less than 20 years. A 1999 population model developed by the U.S. Geological Survey-Patuxent Wildlife Research Center, predicted that existing populations could become extinct within seven years if no conservation measures are taken.

In a metapopulation system such as that of NIDGS, the extinction and re-colonization of local populations is perceived to be a natural occurrence (Smith 1996). Some local populations may be larger and more robust than others because of the availability of suitable resources such as well drained soils, above-ground structure for cover, and diverse and nutritious food sources. These productive sites are often referred to as "source populations." Areas that harbor less resource value may support small populations during periods of ideal climatic conditions but may not remain viable when climatic conditions further reduce the resource value. These sites are referred to as "sink populations" in that most of the animals that occur there arrive via dispersal from source sites (Meffe and Carroll 1994).

In general, larger local populations have a greater ability to persist through intermittent fluctuations in climate and food resources and can serve as source populations, through dispersal, for less viable populations or can re-colonize local populations that have gone extinct (Meffe and Carroll 1994). A necessity for this process to work is the connectivity among local populations, a characteristic that is now lacking across substantial portions of the NIDGS range. Sink populations, although potentially intermittently occupied, are valuable to the metapopulation as well. They can contribute genetic diversity and can serve as a bridge between other source populations that would otherwise lack connection.

For several years, population sites with the largest numbers of NIDGS have been closely monitored by researchers. These sites occur within the Payette National Forest (Slaughter Gulch campground) and the privately-owned OX Ranch. The two population sites on the OX Ranch (Squirrel Manor and Squirrel Valley) have been monitored for the longest period of time. Sherman and Gavin (1997, 1999) and Sherman and Runge (2002) documented the decline of the Squirrel Valley population from 120 individuals in 1987 to 10 in 1999. The Squirrel Manor had a population decline from 250 individuals in 1996 to fewer than 50 individuals in 1999. Each of four other population sites monitored between 1998 and 1999 declined markedly. The declines in 1999 may have been largely due to cold, spring conditions (Sherman and Gavin 1999), whereas the longer-term declines may be related to declining habitat conditions. It is worth noting that the two largest populations exist in close proximity to human habitation and a popular campground, and population declines here have not been attributed primarily to human activity.

Since 1999, IDFG has detected a generally increasing trend in NIDGS populations (IDFG 2008). Of the monitored populations, only the Cold Springs population appears to be at or below the levels recorded in 1999; all other populations have increased. In addition to a general trend of an increasing number of NIDGS, new populations, or populations formerly believed to be extirpated, have been documented. Specifically, the Lost Valley Camp Ground and Tree Farm populations were either repopulated or redetected in 2000 and 2001, respectively. New populations were detected at the Lick Creek lookout in 2006, and at four additional sites in 2008. The overall population estimate for 2008 was

1,512 adults and yearlings; this estimate represents an increase over the 2007 population estimate and a marked increase from population estimates from 1999.

E. Status and Distribution

Historic and Current Distribution

The northern Idaho ground squirrel is found only in Adams and Valley counties of western Idaho. It has the smallest geographic range of any squirrel subspecies and one of the smallest mammal ranges in North America (Gill and Yensen 1992). Its present range is north of Council, Idaho, with one location in Round Valley, and covers an area of about 230,000 acres. Within this extent, northern Idaho ground squirrels are known to occur at 43 isolated sites within an elevation range of 1,312 to 7,565 feet (Evans Mack 2006). Historically, its range probably was much larger and extended southeast to Round Valley near Cascade, Idaho. Of the 43 known occupied sites in 2006, five sites supported greater than 100 individuals (Squirrel Manor, Lost Valley, Price Valley, Price Valley South, and Round Valley), 22 of 43 sites supported less than 20 individuals, and three metapopulation areas (Price Valley, Lost Valley, and Bear Meadows Complex) supported greater than 200 individuals with two nearing 300 (Evans Mack 2006). In 2008, 47 sites were occupied by NIDGS, and the population estimated at 1,512 adults and yearlings (Evans Mack and Bond 2008). The largest colonies continue to occur at Squirrel Manor, Squirrel Valley, Lost Valley Reservoir, and Price Valley (Evans Mack and Bond 2008). Squirrel Manor and Squirrel Valley are located on the proposed action area.

Factors Affecting Species' Environment

The NIDGS is primarily threatened by habitat loss due to forest encroachment into formerly suitable meadow habitat. Forest encroachment results in habitat fragmentation, eliminates potential dispersal corridors, and confines the species populations into small isolated habitat islands. The subspecies is also threatened by land use changes, recreational shooting, poisoning, genetic isolation and genetic drift, random naturally occurring events (stochastic events), and competition from the larger Columbian ground squirrel (Service 2003).

F. Consulted-on Effects Range wide

The Service has conducted numerous informal and formal section 7 consultations with the Forest Service and other Federal agencies. With the exception of the U.S. Forest Service Forest Plan revision, the majority of these consultations were on site-specific actions such as timber sales, vegetation management actions, road maintenance and construction, and livestock grazing. To date, only one consultation authorizing incidental take has been issued (Council to Cuprum Road Construction). Due to the nature of the consultations completed to date (individually and in aggregate), these have not compromised the survival and recovery of the NIDGS. Land management on the Payette and Boise National Forests is considered critically important to the species and its habitat

because these Forests constitute the primary Federal action agency with the potential to affect its survival and assist in recovery under section 7(a)(1) of the Act (Service 2003) and a significant portion of NIDGS habitat and populations are on Forest land.

G. Conservation Needs

A final Recovery Plan (Plan) for NIDGS was developed and released by the Service on July 28, 2003 (Service 2003). The goal of this Plan is to increase the population size and establish a sufficient number of viable metapopulations of the NIDGS, so the subspecies can be delisted. According to the Plan, due to the restricted geographic range and low numbers, the populations of NIDGS must be increased and stabilized. The only historical population level recorded was in 1985 when it was estimated to be approximately 5,000 individuals (Yensen 1985). This estimate was made for populations judged to be in decline; hence, it is thought that the recovery target needs to be higher than this historical estimate (Service 2003). The Plan states that the recovery target for the species is based on an effective population size (*Ne*) of 5,000 among a minimum of 10 metapopulations. Delisting may be considered when four recovery criteria identified in the Plan have been met.

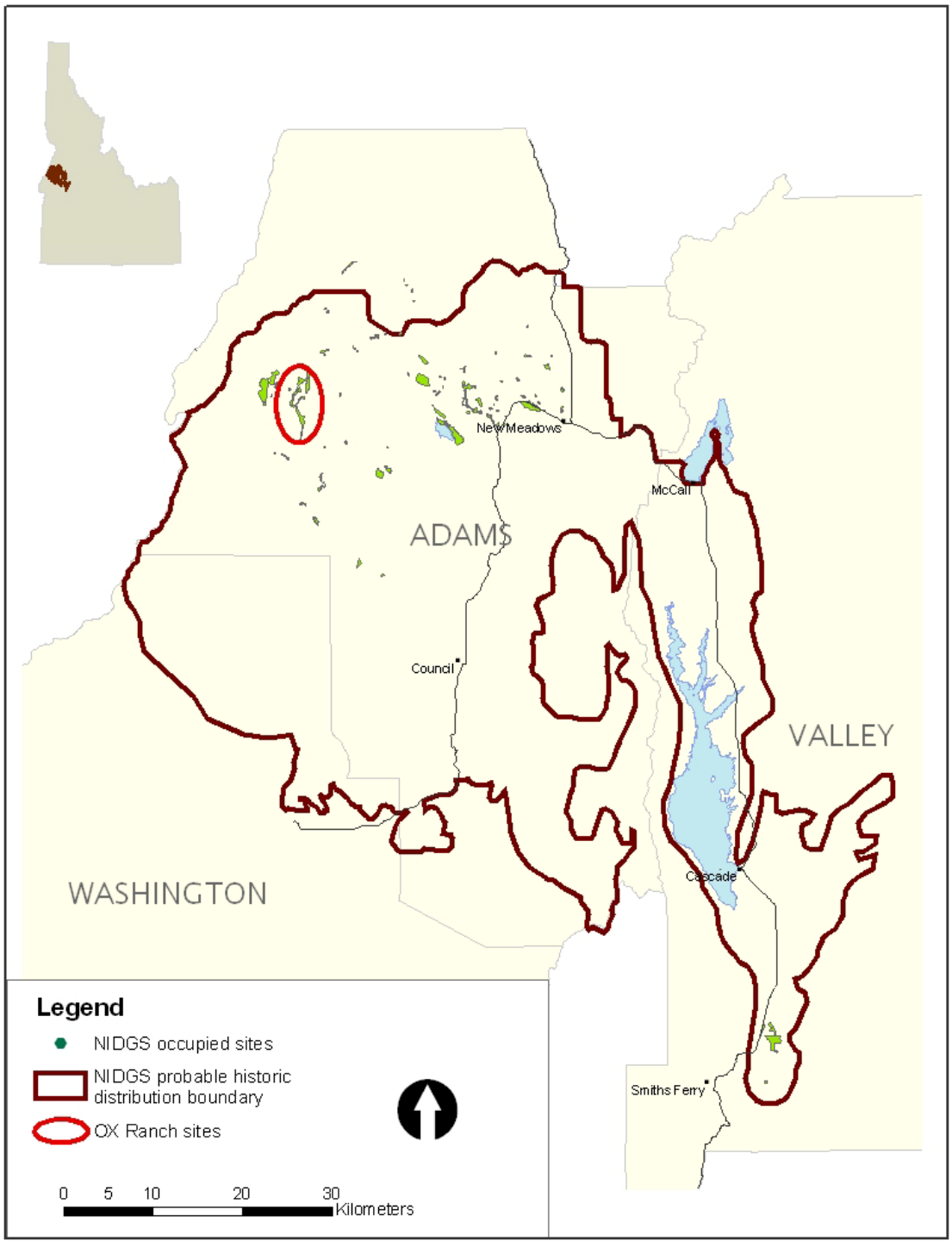
1. Of the 17 potential metapopulations (Figure 2) that have been identified within the probable historical distribution, there must be at least 10 metapopulations, each maintaining an average effective population size of greater than 500 individuals for 5 consecutive years.

2. The area occupied by a minimum of 10 potential metapopulations must be protected. In order for an area to be deemed protected, it must be: (a) owned or managed by a government agency with appropriate management standards in place; (b) managed by a conservation organization that identifies maintenance of the subspecies as the primary objective for the area; or, (c) on private lands with a long-term conservation easement or covenant that commits present and future landowners to the perpetuation of the subspecies.

3. Site-specific management plans have been completed for the continued ecological management of habitats for a minimum of 10 potential metapopulation sites.

4. A post-delisting monitoring plan covering a minimum of 10 potential metapopulation sites has been completed and is ready for implementation.

Figure 2. Northern Idaho Ground Squirrel Probable Historic Distribution and Identified Metapopulation Sites



H. Critical Habitat

No Critical Habitat for NIDGS has been designated.

III. ENVIRONMENTAL BASELINE

The environmental baseline is defined as the past and present impacts on listed species from all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone section 7 consultation, and the impacts of State or private actions that are contemporaneous with the consultation in progress.

A. Status of Species in the Action Area

Of 40 known metapopulations for NIDGS within the range of the species, one (Bear Meadows Complex) occurs within the action area.

Identification of Suitable Habitat

In 2006, scientists with the University of Idaho used a combination of one-meter color photography (NAIP 2004) and Landsat infrared imagery to identify all areas across the landscape where vegetative cover was virtually identical to that present in areas currently occupied by squirrel colonies. This technique is more fully explained in Appendix C of the SHA. In early June 2006, the Service visited select OX sites to ground truth the University of Idaho model. A new colony of NIDGS was found as the result of ground truthing efforts within the area predicted as potential habitat by the model.

The USDA Forest Service (USFS) and the Idaho Department of Fish and Game (IDFG) developed a predictive model for potential northern Idaho ground squirrel habitat in 2005 and 2006. This model used four parameters associated with currently occupied sites as a predictor of other sites to be explored—vegetative cover, slope, aspect, and soil or land type. Colony information was provided by the IDFG in February 2005. All sites throughout the species' range with geophysical and biological characteristics that were identical to those used to develop the model were considered "potential habitat." Application of the USFS/IDFG model to the OX Ranch indicated that approximately 1,896 ha (4,685 ac) of the land was potentially suitable habitat for the species. The model identified both areas that (1) are currently, or were historically, occupied, and (2) potential habitat sites that had not yet been surveyed for northern Idaho ground squirrel occupancy.

It is expected that the amount of habitat in the baseline should support a minimum of 315 to 600 individual squirrels (Evans Mack, IDFG, pers. comm. 2009).

Known Colonies

Northern Idaho ground squirrel colonies on the OX Ranch constitute one of the existing 17 potential metapopulations throughout the range, 10 of which must be conserved if recovery goals are to be met (Service 2003). Within or adjoining the OX land covered in this Agreement are all or portions of 7 separate colonies of NIDGS, encompassing approximately 4,227 ac. Although some of these colonies have been studied and monitored for over 20 years, each is not monitored every year. Additionally, not all of these colonies occur entirely on the OX Ranch properties (e.g., Tree Farm), which affects the description of occupied acreage here and in the determination of baseline habitat. The colonies located at least in part within the action area are as follows:

Table 2. Known Colonies of Northern Idaho Ground Squirrel within or Near the OX Ranch

Name	Status	Approx Acres	2008 Population Estimate
Rocky Comfort Flat	Extant	206	60
Lick Creek	Extant	96	50
Squirrel Manor	Extant	104	195
Tree Farm	Extant	23	43
Squirrel Valley	Extant	144	170
OX – Bear Creek West	Extant	10	15
Bear Meadow North	Extant	104	40
Totals		687	573

B. Factors affecting the Species in the Action Area

In general, the primary threats to NIDGS include habitat loss, degradation, and fragmentation due to conifer encroachment into meadow habitats, changes in vegetation composition and structure, agricultural conversions, and rural development. Other threats identified include mortality associated with roads, poisoning, illegal recreational shooting, competitive exclusion by the larger Columbian ground squirrel, and demographics of small populations (Service 2003). The factors known or suspected to affect NIDGS within the action area are described in greater detail below.

Human Occupation and Use: The action area supports several human families; certain activities of these individuals will affect NIDGS. For example, use of the currently existing roads within the action area may result in direct and indirect mortality to NIDGS. Similarly, human activities such as hiking, horseback riding, picnicking, and using ATVs to travel cross country will result in harassment of NIDGS if the activities occur on or near habitat occupied by NIDGS and occur while NIDGS are active. In addition, some individuals within the action area have pets such as dogs that are likely to chase and possibly kill NIDGS. Further, the OX Ranch frequently hosts visitors that may be

unaware of the status of NIDGS and unable to distinguish NIDGS from Columbian ground squirrels. These guests are thus more likely to engage in illegal shooting.

Roads facilitate human access and activities that could contribute to direct and indirect mortality of NIDGS, including collisions. Given the isolated nature of existing NIDGS colonies and the relatively low population numbers, loss of just a few individuals, particularly adult breeding females, may have demographic consequences (Sherman and Runge 2002). Despite the potential for impacts on NIDGS from vehicle impacts, this appears to be a minor threat within the enrolled lands. The Service has not received any reports of notable road kills from IDFG researchers that annually monitor the NIDGS populations on the OX Ranch.

Livestock Grazing: Northern Idaho ground squirrels may be impacted by competition with livestock for new annual plants. Studies have shown that other ground squirrels are highly selective in diet and feed for at least part of the year exclusively on forage plants selected by cattle (Wagnon et al. 1942; Fitch 1947, 1948). Alternatively, grazing may benefit NIDGS by reducing the overall height and thickness of grasses and herbaceous vegetation. Sherman and Yensen (1994) found that tall spring and summer vegetation may have been unfavorable for ground squirrel species. However, disturbance associated with grazing has also favored exotic annual grasses over native bunch grasses and forbs (Yensen et al 1992). Some researchers have suggested that NIDGS population declines in areas dominated by nonnative grasses may result from an inability to obtain sufficient fat and nutrient laden seeds by mid-July to survive the next eight months in hibernation (Sherman and Gavin 1997). Overall, NIDGS literature has identified both positive and negative effects from livestock grazing, and the net effect, while undoubtedly influenced by the degree of grazing pressure, has not yet been established.

As currently described in the grazing plan for the OX Ranch (see Appendix B of the SHA), livestock grazing may occur within areas occupied by NIDGS. Given that (1) the plan is fairly general, (2) the pastures are much larger than the extent of the NIDGS-occupied area, and (3) the timing of livestock use of the enrolled lands coincides with the active period of NIDGS, there may be interactions on the enrolled lands between NIDGS and livestock. The amount and extent of livestock interactions with NIDGS within the enrolled lands, however, is uncertain and undocumented.

Timber Management: Northern Idaho ground squirrels can be impacted by management of vegetative communities, including timber management. Although NIDGS do not use forested areas, short-term adverse impacts from timber management activities could occur where meadows are used as landings, staging areas, equipment parking or storage. Logging activity, if implemented while squirrels are present and active above ground, can result in direct and indirect mortality from vehicle collisions and crushing. Logging activity may also trigger avoidance behavior and make NIDGS more susceptible to predation (Service 2003). However, as previously described, timber management that reduces or precludes forest encroachment on meadow habitat suitable for NIDGS occupation can result in long-term habitat enhancement and beneficial effects.

Timber management activities do occur on the enrolled lands (see Appendix A), and there may be occasions on the enrolled lands in which timber management activities affect NIDGS, although the extent is uncertain.

Research and Monitoring: The current research and monitoring program likely affects NIDGS, although the degree of impact is debatable. Each spring, IDFG researchers conduct an intensive mark-recapture effort on the Squirrel Manor NIDGS population located within the action area. This effort consists of trapping each individual, marking it with non-toxic temporary hair dye, and releasing it. Although each individual is handled for less than 15 minutes, the mark-recapture activity alters the activity budgets of all NIDGS within the Squirrel Manor population for the duration of the effort. NIDGS are likely to spend less time feeding and more time sheltering during the trapping activities. Despite the alteration in activity budgets, the duration of the trapping is short and the impacts of handling individuals is limited by the use of only experienced staff. These activities, and any potential associated adverse effects, are covered separately under a Section 6 Agreement between the Service and IDFG.

Predation/Competition: The range of the Columbian ground squirrel overlaps the distribution of the NIDGS. Sherman and Yensen (1994) reported that the segregation of these two species is due to competitive exclusion as opposed to differing habitat requirements. Columbian ground squirrels have been documented at the Rocky Comfort Flat and Lick Creek sites on the OX Ranch (Evans Mack 2008). No additional information regarding the specific effects of competition between NIDGS and Columbian ground squirrels on the OX Ranch is currently available.

Demographics: Sherman and Runge (2002) observed unusually high mortality of older breeding females in the Squirrel Valley population, which appears to have contributed to a collapse of this population from 1986-1999. They hypothesized this population decline was a demographic response to loss and fragmentation of meadow habitats, as well as changes in vegetation composition within meadow habitats. This change in habitat quality, quantity, and distribution has been attributed to: a) fire suppression which has allowed for conifer encroachment into meadow ecosystems; b) the introduction of exotic pasture grasses; and c) past and present livestock grazing which has modified the herbaceous communities that are important to ground squirrels (Sherman and Runge 2002).

As previously described, although detailed demographic studies have not been repeated on the OX Ranch since the 1990's, the population of the Bear Meadows/Rocky Comfort Flat metapopulation has generally been increasing since 2004 (Evans Mack 2008). The 2008 NIDGS populations on the OX Ranch are summarized in Table 2.

IV. EFFECTS OF THE ACTION

Regulations implementing section 7 of the Act define effects of the action as the direct and indirect effects of an action on the listed species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). Effects of the action that

reduce the ability of a listed species to meet its biological requirements may increase the likelihood that the proposed action will result in jeopardy to that listed species or in destruction or adverse modification of a designated critical habitat. No critical habitat for NIDGS has been designated, thus none will be affected.

A. General Occupation and Use

Adverse effects to NIDGS are anticipated on the OX Ranch from the general occupation and use of the property. Residents are expected to continue to have pets and use driveways and roads within the property. The exposure potential is minimal due to the combination of infrequent interactions between pets and NIDGS, and the short durations of any interactions that occur. However, it is possible that pets may disturb NIDGS near areas of human activity. We anticipate that disturbance will be minimal over the period of the SHA, but it is expected to occur.

The use of driveways is not expected to result in adverse effects to NIDGS because human dwellings are generally not co-located with NIDGS colonies (with one notable exception – Squirrel Manor). In that location, the caretaker is aware of the NIDGS population and uses the driveway with sufficient awareness to prevent adverse effects. However, human use of the roads across the enrolled lands may result in occasional direct mortality or injury of NIDGS. Because NIDGS are generally able to avoid vehicles and residents are aware that NIDGS are a listed species, we expect any adverse effect from vehicle impacts to be minimal. However, over the term of the SHA it is possible that NIDGS may be killed on roads across the enrolled property. It should be noted that potential adverse effects associated with general public use of county roads that cross through the property are not considered part of the proposed action, nor are they under the control of the Cooperator.

In addition to use of driveways and roads by residents, the SHA also provides for potential construction of new buildings and remodeling of existing structures. Such construction or remodeling would likely require the improvement or construction of new sewer, water, or electrical service to buildings and residences. Adverse impacts on NIDGS from these activities are possible but unlikely because the existing residences (except the residence at Squirrel Manor) appear sufficiently distant from NIDGS colonies to prevent direct mortality and harassment related to construction activities. At Squirrel Manor we expect minor adverse effects from human occupation, largely related to occasional disturbance associated with people entering and leaving the residence and engaging in normal occupancy-related tasks such as house and yard maintenance.

Residents may also apply rodenticides and need to respond to wildfires, both of which may adversely impact NIDGS. Adverse impacts from rodenticide application will be limited by the SHA's restrictions that require the use of a certified applicator and reduces application to within 100 feet of existing structures; any take resulting from application of pesticides or other chemicals is not covered in this Opinion. Responding to wildfires may adversely impact NIDGS, particularly if meadow areas are used as staging areas for equipment, or if access roads are built through areas occupied by NIDGS. However, the Cooperator is not likely to engage in fire suppression activities using large equipment

without the involvement of the Payette National Forest or other agency fire response resources. As such, any major fire camp staging or suppression activities are considered in a separate consultation with the Payette National Forest. Given this, we do not anticipate adverse effects to NIDGS associated with the implementation of the SHA or the Cooperator's fire control efforts.

B. Livestock Grazing

The potential effects of livestock grazing on northern Idaho ground squirrel habitat are not well understood. No studies have been conducted on the effects of livestock grazing on NIDGS, but studies on other rodents, and particularly other ground squirrel species, provides insight into potential effects. Fitch (1947 and 1948), studying the seasonal feeding habits of ground squirrels, found them to be highly selective in diet, feeding for part of the year exclusively on forage plants that Wagnon et al. (1942) had shown were also being grazed in that season by cattle. These studies showed that both the ground squirrels and the cattle began feeding on the new annual plants.

More recent studies have documented a variety of effects, depending on the location of the study, the degree of impact, and life histories of the plants and rodents present. Cattle grazing is associated with a decrease in rodent species diversity in arid environments, probably due to a decline in plant species diversity (Hanley and Page 1981) or to structural changes in vegetation (Rosenzweig and Winakur 1969). Other studies have found no detectable effects of grazing on other small mammal species (e.g., Roundy and Jordan 1988; Heske and Campbell 1991).

NIDGS literature has identified both positive and negative effects from livestock grazing, but these effects are generally based on observations and not rigorous studies. In 1993, Sherman and Yensen (1994) found that unusually tall spring and summer vegetation may have been unfavorable for ground squirrel species. Results suggest the importance of keeping the grass height down by using large herbivores as "tools" to manage for ground squirrels. However, disturbance associated with grazing has also favored exotic annual grasses over native bunch grasses and forbs (Yensen et al 1992). NIDGS population declines in areas dominated by nonnative grasses may result from an inability to obtain sufficient fat and nutrient laden seeds by mid-July to survive the next eight months in hibernation (Sherman and Gavin 1997).

Recent data summaries at current NIDGS monitoring sites indicate 6-year average utilization levels (2001-2006) of 7 to 25 percent. This level of utilization is considered very light. Light utilization is defined at 20 to 40 percent; low value (less desirable) herbaceous plants are not grazed, 60 to 80 percent of the current seed stalks or key herbaceous species remain intact, and most young plants are not grazed. Moderate utilization is defined by 40 to 60 percent utilization with 15 to 25 percent of key herbaceous species remaining intact; no more than 10 percent of the low value herbaceous forage plants are utilized.

Because livestock grazing and occupied NIDGS habitat overlap on the OX Ranch, it is clear that livestock may alter the vegetative components of NIDGS habitat. Heavy or

concentrated use may reduce vegetation that the squirrels require or prefer. It may also allow less palatable or nutritious species to become established on a site, or allow for the introduction of exotic weed species. Heavy or concentrated use may also reduce fine fuels required for successful habitat enhancements (i.e., prescribed fire).

Conversely, moderate to light use by cattle may transform tall, decadent vegetation into lower more palatable vegetation thus having a beneficial effect. Researchers have suggested that livestock grazing that manages for grass heights of a minimum of four inches with maximum seed head production would benefit ground squirrel nutrition and predator avoidance (Sherman and Yensen, 1994).

Given that livestock grazing can alter the vegetative component of ground squirrel habitat, insight into intensity and timing of grazing and the associated effects on the vegetation is needed. A study of small mammal populations in grazed and ungrazed riparian habitat in northeast Nevada found the most evident structural difference between grazed and ungrazed habitat was in the herbaceous layer where graminoid biomass and graminoid and forb height values were reduced on the grazed site (Medin and Clary 1989). Graminoid biomass on the grazed plot was only half that inside the exclosure. Five of the 11 species of mammals trapped were found only in the ungrazed habitat. Townsend's ground squirrel (*Spermophilus townsendii*) was one of them, and Golden-mantled ground squirrels (*Spermophilus lateralis*) were more abundant in the ungrazed site.

Another study by Oldemeyer and Allen-Johnson (1988) measured the effects of cattle grazing on small mammal microhabitat and abundance in northwest Nevada. The 17,183 acre allotment was grazed between mid-June through early August one year and early August through late October the next year, over a five year period. Total relative abundance of small mammals did not differ between year or area. Townsend's ground squirrels and golden-mantled ground squirrels were found on both grazed and ungrazed sites on alternate years. There was a general trend for cover of both grasses and forbs to be lower in the allotment than in the exclosure. However, the means did not differ significantly.

Comparing these two studies suggests that differing intensities and timing of livestock grazing can have a varied effect on small mammals. There is some level of grazing that benefits habitat requirements. However, beyond a certain threshold level effects become detrimental to small mammals. In California, Fehmi et al. (2005), found that California ground squirrels (*Spermophilus beecheyii* Richardson) when subjected to low to moderate levels of cattle grazing did not appear to have a strong effect on the population dynamics of California ground squirrels, and grazing may be compatible with maintenance of ground squirrel populations. Based on multivariate analysis of variance of 1994 data, live plant cover, native plant cover, and standing biomass were lower where the number of burrows was higher on grazed colonies but were little affected on ungrazed colonies. Management of livestock grazing also includes fence reconstruction and use of spring or pond developments. Maintenance of existing fences can cause ground disturbance when setting posts or braces.

Based on these studies, and the fact that livestock use on the OX Ranch has been relatively light with use levels showing no correlation with changes in NIDGS, one could infer that light amounts of livestock grazing are having only negligible adverse effects, and potentially limited beneficial effects, on NIDGS populations at this time. However, because all populations on the Ranch are not intensively monitored and because there are many uncertainties associated with NIDGS declines, we assume that adverse effects are likely. Without a site specific study on how grazing induced vegetation changes are adversely affecting NIDGS, we cannot discount the potential for adverse effects.

C. Recreation

As used here, "recreation activities" refers to those activities undertaken by humans when they are not actively engaged in operating the ranch. Adverse effects to NIDGS may occur from recreation activities on the OX Ranch. Visitors and residents are expected to hike, ride horses, picnic, and use cross-country motor vehicles and snowmobiles to access relatively more remote areas. Cross-country motor vehicle use can detrimentally impact NIDGS habitat through soil compaction and removal of vegetation and can physically harm northern Idaho ground squirrel individuals via collisions. Increased access afforded by cross-country motor vehicles may also facilitate illegal shooting. It should be noted, however, that all of the activities discussed here are currently ongoing, and the proposed action is not expected to result in an increase in any associated potential adverse impact on NIDGS.

If effects on NIDGS are adverse and noticeable, the Cooperators will inform the Service and IDFG. The Service and IDFG will develop signs, and the Cooperator will post the signs in areas occupied by NIDGS and frequented by their guests. The signs will provide information on NIDGS and advise visitors how to reduce impacts (disturbance, harassment, and illegal shooting).

Non-motorized dispersed recreation is not expected to have more than negligible impacts on NIDGS. On the occasion that a person or horse might travel through occupied habitat, it is reasonable to expect that the squirrels will be react to such disturbance by moving below ground. Because such use is of low intensity, no trailing or soil compaction is expected. Populations of NIDGS will be regularly monitored by IDFG and the Service over the term of the SHA, which ensures that adaptive actions may be taken if necessary to reduce adverse effects to the species. In addition, guests using the property will be informed about NIDGS and how to minimize the potential for their activities to affect the species on the enrolled lands.

D. Timber Management

NIDGS can be impacted by management of vegetative communities, including timber management. Although NIDGS do not use forested areas, short-term adverse impacts from timber management activities could occur where meadows are used as landings, staging areas, equipment parking, or storage. Logging activity, if implemented while squirrels are present and active above ground, can result in direct and indirect mortality from vehicle collisions and crushing. Logging activity may also trigger avoidance

behavior and make NIDGS more susceptible to predation (Service 2003). Even if logging activities are conducted when NIDGS are below ground, crushing may still occur from soil compaction beneath the heavy machinery typically used. NIDGS mortalities from soil compaction are best avoided by conducting logging activities during the winter months when the soil is frozen; compaction is unlikely to result from the use of heavy equipment during this time.

One of the main identified threats to NIDGS is habitat loss due to forest encroachment (Service 2003). Consequently, in the long-term, this species can benefit from vegetation management designed to reduce stand densities, maintain a vegetation mosaic that includes openings, and remove encroaching conifers from dry meadows (Service 2003). Such prescriptions improve habitat conditions for NIDGS and are likely to be either benign or beneficial to the species in the long-term.

Under the SHA, one of two actions will be taken by the Cooperator. Either the Cooperator will (1) conduct a minimum of 15 ac of habitat enhancement treatment (thinning) to benefit NIDGS, or (2) work with the Agencies to identify enrolled lands that could be used in a study to compare efficacy of different habitat treatments in enhancing the quality of NIDGS habitat. Under either option, habitat enhancement would be conducted between December and March to avoid soil compaction and potential conflicts between NIDGS and logging operations. The SHA contains three additional conservation measures to minimize short-term impacts of the habitat enhancement actions on NIDGS (i.e., scattering slash piles, restricted burn window, and log hauling restrictions). With these measures and a restricted work period in place, short-term adverse effects to NIDGS are expected to be minimal and greatly outweighed by the long-term benefits of a greater quantity of higher quality habitat available for NIDGS occupation.

Use of prescribed fire is not directly addressed by the SHA. However, this activity is typically paired with timber cutting activities intended to reduce fuels or open habitat, which is addressed by the SHA. The suppression or control of wildfire in south-central Idaho has contributed to conifer encroachment on meadow habitats, and subsequent loss and degradation of NIDGS habitat. Prescribed fire can be used to restore or maintain natural ecosystems by reducing fuel accumulations, reducing the risk of future severe wildland fires, recycling nutrients, enhancing fire dependent vegetation communities, and promoting growth of early seral vegetation. Thus, prescribed fire in NIDGS habitat has the potential to result in long-term benefits to the species (Sherman and Runge 2002).

Because all timber management activities within occupied NIDGS habitats will occur during the winter and after the ground freezes, we do not anticipate any measurable adverse effects to NIDGS from these activities. Specifically, we do not anticipate any direct NIDGS mortality from vehicle collisions or any indirect NIDGS mortality from crushing caused by soil compaction.

E. Research and Monitoring

Monitoring activities associated with the proposed action would affect many individuals of the extant population. The effect of monitoring would likely be minor due to the fact that no individuals would be captured or handled, the amount of time individual squirrels would be disturbed (less than three hours), and the number of times the population would be monitored (approximately five times per year). These activities, and any potential adverse effects, are covered separately by a Section 6 Agreement between the Service and IDFG.

F. Predator/Competitor control

Control of predators (badgers and/or coyotes) and/or potential competing species (Columbia ground squirrels), if necessary, would likely result in the short-term reduction in predation of and/or competition with NIDGS. This short-term reduction in predation and/or competition could result in a greater likelihood of long-term persistence of the NIDGS population in the action area. Control actions would likely affect NIDGS individuals through disturbance via humans placing traps and/or shooting predators. The effect of this disturbance would likely be minor because it is expected to be short-term (up to three hours per control action). Long-term benefits are expected as a result of these activities. Actions associated with predator or competitor control will be carried out by Idaho Wildlife Services and their professional agents. The Service has consulted separately under section 7 with Idaho Wildlife Services on both their rodent control and predator control programs (File #140.0200) and will not consider the effects of such actions further in this Opinion.

G. Summary

Management actions identified as part of the proposed action are intended to decrease the impact of these potential adverse affects to NIDGS. Collectively these actions reduce the likelihood of an adverse effect due to human disturbance, and preserve occupied habitat. Potential adverse effects from the proposed action are believed to be outweighed by the benefits of preserving existing occupied habitat in the protected area from development for at least 10 years. However, some adverse effects to NIDGS are expected associated with certain activities in the action area, as described above.

V. CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The predominant ongoing activities on non-Federal lands that are reasonably certain to affect NIDGS and their habitat include timber harvest, livestock grazing, road construction, recreation, fire suppression, and residential development. Land uses also

include limited amounts of cultivation and irrigation of hay fields and pastures, water diversions and water-right allocations, and residential development.

State and private land timber harvest and related road construction activities within Idaho are regulated by the IFPA, under the IDL. Activities that are requested by the IFPA that may not provide adequate protection for NIDGS and their habitat include: road construction and maintenance, timber harvest, and fire management. Conversely, Forest management that reduces tree stocking and increases openings could have a beneficial effect on the species. There is one known NIDGS colony on State land and several private tracts where these actions are reasonably certain to directly or indirectly affect ground squirrels.

As noted above, there are pathways for both adverse and beneficial effects on ground squirrels from livestock grazing. State lands leased for grazing are currently operated under BMPs established under Grazing Management Plans, overseen by the IDL. Grazing BMPs as identified in the Idaho State Agricultural Pollution Abatement Plan (State Plan) are not mandatory but recommended for private lands. Because compliance with the State Plan is not required on private lands, no monitoring plan is in place to evaluate potential impacts to Act listed species or designated critical habitat. The IDL does perform monitoring of larger tracts of leased lands to ensure compliance with established grazing management plans. However, smaller, more isolated blocks of leased land are often not monitored for compliance and managed according to lands surrounding them (private or federal). Grazing management plans as currently required by IDL are authorized for ten-year terms, leading to an inability to incorporate new and more ecologically friendly practices as these practices evolve. State management plan BMPs typically revolve around season of use and animal unit months (AUMs), not focusing on riparian area monitoring and protection. Given the limited controls on grazing under state oversight, it is unlikely that management would be carried out to assure adverse effects on ground squirrels would be avoided and minimized.

As with timber management and grazing, recreation and fire management on non-Federal lands does not come with assurances of protection of listed species. The general nature of impacts of these activities on ground squirrels is described above. It is reasonably certain that adverse effects on the species could result from these activities. A number of ground squirrel colonies are located on private lands that are presently managed for agricultural uses. There is potential from the development of parts of these properties for residential use, and subsequent loss of northern Idaho ground squirrel habitat.

The Act provides options for non-Federal entities to develop conservation agreements and Habitat Conservation Plans that address management and development effects on candidate, proposed, and listed species. Landowners in the general vicinity of the action area have been working with the Service to conserve other species, including southern Idaho ground squirrel. It is possible that in the future, NIDGS may benefit from actions carried out under similar private/Federal agreements.

VI. CONCLUSION

After reviewing the status of the affected species, the environmental baseline for the action area, the effects of the proposed action, and cumulative effects, the Service concludes that the action as proposed is not likely to jeopardize the continued existence of the NIDGS. This determination is based upon the following considerations:

- Although the proposed action may have some adverse effects on a small number of individual NIDGS, these effects are not likely to cause a measurable response in NIDGS populations.
- Proposed conservation measures are expected to benefit multiple populations within one of the metapopulations of NIDGS through maintenance of existing habitat, creation of additional suitable habitat through habitat enhancements, and multiple measures implemented to reduce any potential adverse effects associated with general operations on OX Ranch.

Direct modifications to NIDGS habitat are limited and impacts to the extant population would likely be minor. Indirect effects would be managed by implementation of the outreach, shooting prohibition, and predator/competitor control actions described above. Long-term protection of occupied habitat would improve the likelihood of persistence of NIDGS at the site. This project would not reduce the reproduction, status, distribution, or genetics of NIDGS to a point where the likelihood of its survival and recovery is appreciably reduced, long-term maintenance or enhancement of NIDGS within the action area is expected as a result of approval and implementation of the SHA.

VII. INCIDENTAL TAKE STATEMENT

Section 9 Federal regulations pursuant to section 4(d) of the Act prohibit the taking of endangered and threatened species, respectively, unless special exemption is granted. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. Harm is further defined by the Service to include significant habitat modifications or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, and sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental take Statement.

A. General Occupation/Use

Amount of Take

The Service anticipates that take in the form of death or injury to individual NIDGS, and harassment of individual squirrels are reasonably certain to occur as a result of the proposed action. Calculation of the amount of incidental take that may occur is complicated by the annual variation in the potential numbers of NIDGS that may inhabit an area.

Human use of roads on the property may kill or injure individual squirrels. The number of squirrels that may be killed or injured by motor vehicles is expected to be minimal due to the limited duration of exposure and the nature of motor vehicle use on the enrolled lands (i.e., travel primarily for ranch personnel, guests, and business and recreational activities; limited public access onto enrolled lands). Adverse effects associated with motor vehicle use may occur within the occupied areas of the Baseline. Because some roads are adjacent to known NIDGS colonies, it is reasonable to assume that collisions between NIDGS and vehicles will occur. The Service expects that approximately five NIDGS will be killed as a result of Cooperator travel on the public roads crossing the OX Ranch in the ten-year term of this consultation. This estimated amount of take does not include an amount resulting from public use of public roads because such use is not part of the proposed action.

Human and pet activity near any NIDGS-occupied site will likely result in temporary disturbance of individual squirrels during their active season (April through August). The effect of such disturbance will be a temporary alteration in an individual NIDGS's activity pattern (e.g., increased sheltering and decreased feeding). The extent of this disturbance will be determined by numerous factors, including the duration of the activity, the proximity to NIDGS-occupied areas, and the number of NIDGS present and active. The amount of take resulting from human and pet harassment is difficult to quantify due to the large number of variables involved in the interaction. Such routine human and pet activities will likely only result in temporary, short-term disturbances to NIDGS. Current information suggests that only one NIDGS population within the action area is exposed to potential pet activity. Taking into consideration all of the factors listed above that influence the amount of NIDGS-pet interaction that is possible, and given that only one NIDGS population is potentially exposed within the action area, both the exposure potential, and any potential take, is minimal. We estimate that, on average, one harassment incident may occur per year on the enrolled lands, and that two NIDGS may be affected to the extent that their normal activity pattern is significantly altered. We do not anticipate any incidental take in the form of harm or death associated with pet and NIDGS interactions.

Although the SHA restricts the Cooperator's use of rodenticides, incidental take of NIDGS as a result of any pesticide use would not be authorized under the permit. This is consistent with Regional Service policy (per July 27, 1998, Regional Memorandum).

Effect of Take

The Service has determined that the effect of motor vehicle use by residents and agency personnel will not result in a level of take that will jeopardize the NIDGS. The proposed action is not expected to significantly reduce the reproduction, status, and distribution of NIDGS in the action area, and will not appreciably reduce the likelihood of survival and recovery of the species. Further, the proposed action has been designed to minimize the amount of take.

Similarly, the Service has determined that the effect of disturbance from human and pet activity through harassment will not result in a level of take that will jeopardize the NIDGS. The exposure potential is minimal due to the combination of infrequent interactions between pets and NIDGS, and the short durations of any interactions that occur. This portion of the proposed action is not expected to significantly reduce the reproduction, status, and distribution of NIDGS in the action area.

We do not anticipate appreciable reductions in the numbers, distribution, or reproduction of NIDGSs that occur in the action area from general occupation or use of the action area as described in the SHA. Instead, over the long-term, we expect the proposed action to contribute to the conservation and recovery of NIDGS throughout the action area and the metapopulation within the action area.

B. Livestock Grazing

Amount of Take

The Service expects that the proposed action may result in take of NIDGS through harm, injury, and potentially death associated with competition between NIDGS and livestock. However, such take is also likely to result from environmental conditions as well, and it is not possible to specifically attribute some portion of that take to the Service's action. Also, it is extremely difficult to detect such take and to attribute it to a specific cause because a complexity of factors influence the NIDGS and because we lack the ability to measure such harm, injury, and death to the species associated with grazing. Given these factors, it is not possible or reasonable for the Service to provide a quantitative description of incidental take that is reasonably likely to result from the proposed action. As such, we are not providing section 7(b)(4) or 7(o)(2) exemption from take prohibitions under section 9 of the Act in this Opinion for the potential take of NIDGS associated with livestock grazing in the action area.

C. Recreation

Amount of Take

Recreational activities near any NIDGS-occupied site will likely result in temporary disturbance of individual squirrels during their active season (April through August).

The effect of such disturbance will be a temporary alteration in an individual NIDGS's activity pattern (e.g., increased sheltering and decreased feeding). The amount of take resulting from human and pet harassment is difficult to quantify due to the large number of variables involved in the interaction, however routine recreational activities will likely only result in temporary, short-term disturbances to NIDGS. We estimate that, on average, one harassment incident may occur per year on the enrolled lands, and that two NIDGS may be affected to the extent that their normal activity pattern is significantly altered. We do not anticipate any incidental take in the form of harm or death associated with recreation.

Effect of Take

The Service has determined that the effect of recreation will not result in a level of take that will jeopardize the NIDGS. While visitors may pass through areas occupied by NIDGS, the duration of any resulting interaction will be brief. In addition, the actual number of interactions between visitors and NIDGS is expected to be low because the visitors are expected to frequent forested areas and not dwell in the meadow areas which NIDGS occupy. Thus, the exposure potential is minimal due to the combination of infrequent interactions between visitors and NIDGS, and the short durations of any interactions that occur. This portion of the proposed action is not expected to significantly reduce the reproduction, status, and distribution of NIDGS in the action area.

D. Research and Monitoring

The Service expects that the proposed action may result in take of NIDGS through harassment, injury, and potentially death associated with research and monitoring activities within the action area. The number of squirrels that may be harassed, injured, or killed by agency personnel during research and monitoring efforts is expected to be minor due to the limited duration of exposure (few occurrences each year and each occurrence is a brief, temporary disturbance) and the nature of the activities. These activities, and any potential adverse effects, are covered separately under a Section 6 Agreement between the Service and IDFG.

E. Reasonable and Prudent Measures

The SHA and its associated documents clearly identify anticipated impacts to affected species likely to result from the proposed taking and the measures that are necessary and appropriate to minimize those impacts. All conservation measures described in the proposed SHA, together with the terms and conditions described in any section 10(a)(1)(A) permit issued with respect to the proposed SHA, are hereby incorporated by reference as reasonable and prudent measures and terms and conditions (see below) pursuant to 50 CFR 402.14(I).

F. Terms and Conditions

Through negotiations with the Cooperator, the Service has incorporated measures to minimize adverse effects in the SHA to the maximum extent practical. To be exempt from the prohibitions of section 9 of the Act, the Cooperator must comply with the conservation actions as outlined in the SHA and the terms and conditions associated with

their section 10(a)(1)(A) permit. These terms and conditions are non-discretionary and must be undertaken for the exemptions under section 10(a)(1)(A) and section 7(o)(2) of the Act to apply. If the Cooperator fails to adhere to these terms and conditions, the protective coverage of the section 10(a)(1)(A) permit and section 7(o)(2) may lapse.

G. Monitoring and Reporting

The Service, IDFG, and Cooperators must carry out the following monitoring and reporting of incidental take resulting from project implementation. This monitoring and reporting is non-discretionary.

1. The Cooperators, IDFG, and/or Service personnel shall inform the Service of take of NIDGS associated with the proper implementation of the permit conditions for the proposed project, including implementation of the proposed conservation measures.

2. Any NIDGS found dead due to take incidental to or as a result of this action shall be placed in an appropriate container (e.g., a clean plastic bag) and frozen as soon as possible. The exact location shall be noted along with any other evidence pertaining to the cause of death. As soon as possible, this information and the location of the carcass shall be provided to the Service (Idaho Fish and Wildlife Office) at (208) 378-5243 or Ray Vizgirdas at (208) 378-5249. Carcasses will eventually be deposited at the College of Idaho Museum. The incidence and location of injured NIDGS should also be reported to this office.

VII. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse affects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

No conservation recommendations are provided here because the SHA has included conservation measures to promote the conservation of NIDGS within the action area; additional recommendations are not necessary.

V. REINITIATION NOTICE

This concludes formal consultation on the Service's issuance of a section 10(a)(1)(A) permit associated with the OX Ranch SHA. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where there is discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion; (3) the agency action is subsequently modified in manner that causes an effect to the listed species or critical habitat that was

not considered in this Opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

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B. Personal Communications

Evans Mack, Diane. 2007. Email between Diane Evens Mack, Non-game Wildlife Biologist, Idaho Department of Fish and Game, and Carmen Thomas, Service, Boise, Idaho. Subject: minimum population of northern Idaho ground squirrels that the OX Ranch suitable habitat should be able to support.

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