

## CHAPTER IX: NORTHERN IDAHO GROUND SQUIRREL

### A. Status of the Species

#### 1. Listing History

In March of 1998, the Service proposed that the northern Idaho ground squirrel (*Spermophilus brunneus brunneus*; NIDGS) be listed under the Endangered Species Act (Act) as a threatened species; it was subsequently listed as threatened on April 5, 2000. A Recovery Plan for NIDGS was developed and published by the Service on July 28, 2003 (Service 2003). The recovery priority number for the subspecies is 3C on a scale of 1 to 18, indicating that it is: 1) taxonomically, a subspecies; 2) facing a high degree of threat; 3) rated high in terms of recovery potential; and 4) may be in conflict with construction and recreational development projects or other forms of economic activity. Critical habitat has not been designated for NIDGS.

#### 2. Description of the Species

The NIDGS is a relatively small member of the genus *Spermophilus*; the mean lengths of the male and female are 23.4 centimeters (9.2 inches) and 22.6 centimeters (8.9 inches), respectively (Yensen and Sherman 1997). The pelage (fur) of NIDGS on the dorsal area appears dark reddish-gray as the result of a mixture of black unbanded and yellowish-red banded guard hairs. The subspecies' eye ring is buffy-white.

The NIDGS has the most restricted geographical range of any *Spermophilus* species (Figure 17), and one of the smallest ranges of any North American mammal (Gill and Yensen 1992). The first specimens were collected in 1913 by L.E. Wyman, and described by A.H. Howell as a subspecies (*Citellus townsendii brunneus*) of the present-day Washington ground squirrel (*Spermophilus washingtoni*) (then confused with the Townsend's ground squirrel, *C. townsendii*) (Howell 1938). Subsequently, Howell (1938) reclassified the Idaho ground squirrel as a full species, *Citellus brunneus*. Hershkovitz (1949) demonstrated that *Spermophilus* is the correct name for the genus. The systematics of *Spermophilus brunneus* were further investigated by Nadler et.al. (1973) with chromosomal descriptions. Yensen (1991) determined that *Spermophilus brunneus* consisted of two subspecies (the NIDGS, *Spermophilus brunneus brunneus*, and the southern Idaho ground squirrel, *Spermophilus brunneus endemicus*) based on cranial morphology, pelage, life history differences, and other characteristics.

#### 3. Life History and Habitat Requirements

Ponderosa pine (*Pinus ponderosa*) and Douglas-fir (*Pseudotsuga menziesii*) with shrub steppe open areas associated with south-facing slopes with less than 30 percent slope below elevation of 1,830 meters (6,000 feet) is considered potentially suitable habitat (Service 2003). These naturally occurring pockets of habitat are open areas that usually have shallow soil with intrusions of deeper soil. The areas of deeper soil are necessary for nest burrows by the ground squirrels. This ground squirrel is not abundant in meadows that contain high densities of small trees (Sherman and Yensen 1994).

Prior to 2005, NIDGS were considered restricted to elevations between 1,160 to 1,830 meters (3,800 to 6,000 feet) elevation in areas with north-facing slopes and gentle terrain. More recent surveys conducted in 2006 and 2007 detected NIDGS at elevations as high as 2,300 meters (7,500 feet) indicating a broader elevational range that previously documented (Evans-Mack 2006). The *Probable Historic Distribution* (PHD) for the NIDGS is being revised to reflect this new information (Ray Vizgirdas, Service, pers. comm., August 25, 2008).

The NIDGS emerge usually in late March or early April and cease above ground activity in late July or early August. Emergence begins with adult males, followed by adult females and then yearlings. The species becomes reproductively active within the first two weeks of emergence (Yensen 1991). Females that survive the first winter live on nearly twice as long as males (on average 3.2 years for females compared to 1.7 years for males). Males normally die at a younger age due to behavior associated with reproductive activity.

The NIDGS often digs burrows under logs, rocks and other objects. While dry vegetation sites with shallow soils of less than 50 centimeters (19.5 inches) depth above bedrock are used for auxiliary burrow systems (Yensen, et al 1991), nesting burrows are found in soil pockets that are deeper than 1 meter (3.28 feet) deep (Yensen, et al 1991, Yensen and Sherman 1997). Squirrels move between patches of habitat by crossing open stands of forest vegetation. Dense stands of trees restrict movement of squirrels between habitat patches. Although Columbian ground squirrels (*Spermophilus columbianus*) overlap in distribution with the NIDGS (Yensen and Sherman, unpublished data, Dyni and Yensen 1996), Columbian ground squirrels prefer moister areas with deeper soils.

The NIDGS consumes at least 45 to 50 plant species (Dyini and Yensen 1996). Seeds of forbs, lupines, and composites are important, while roots, bulbs, leaf stems, and flower heads are a minor component of their diet. Grasses and seeds are especially important, and it ingests large amounts of bluegrass (*Poa* sp.) and other grass seeds to store energy for the winter (Dyini and Yensen 1996). Additionally, NIDGS often inhabits areas with shorter, sparser vegetation than the Columbian ground squirrel. Such areas likely contain less abundant food resources than habitats occupied by Columbian ground squirrels (Dyini and Yensen 1996).

#### 4. Population Dynamics

As a result of the factors described in the Life History and Habitat Requirements section, and due to the small sizes of the remaining population sites, the 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 ran a computer population viability simulation program using recruitment and death values recorded over 8 years from an intensively studied NIDGS population site (Gavin *et al.* 1999; Sherman and Yensen 1994). Variables in the model included no natural immigration, and began the population viability analysis using 50 individuals, a figure that was 30 individuals lower than the actual population size of 80 individuals (Sherman and Yensen 1994). The model calculated that all but 1 of 100 population sites would become extinct in less than 20 years.

The Service then contracted with the U.S. Geological Survey-Patuxent Wildlife Research Center, to develop a population model for the NIDGS (Runge 1999). The program was designed to allow the user to develop population projections for a population site or population complex using data collected about the demographic structure over 3 or more years. Using the assumptions of a closed population and overwintering survival of the female and pups, this model predicts population extinction within 7 years using current demographic trends if no conservation measures are taken.

Winter mortality may be a significant factor in the dynamics of this species, especially when juvenile squirrels enter torpor without sufficient fat reserves and snow levels are below average. When the snow pack is shallow, the energy requirements necessary for thermoregulation may increase mortality due to depletion of fat reserves. Although the relationship between ground squirrels and weather is complex, populations may have been adversely affected by drought and winter mortality in the early 1990's. On the other hand, higher than average snowfall combined with cool and stormy springs may result in above average mortality due to insufficient food availability and fat reserves upon emergence from hibernation.

There is a paucity of information about factors affecting fecundity and recruitment of the NIDGS. Models provide descriptive and predictive demographic information related to observed numbers and distribution of the species, but little insight into the causal factors. Until forces driving reproductive success and dispersal are better understood, management of the species must focus on restoring habitat and minimizing adverse effects on its quality and abundance.

##### 5. Historic and Current Distribution

The distribution of the NIDGS has become fragmented into what are now very small, isolated populations in Adams and Valley Counties of west-central Idaho (Figure 18), an area covering approximately 1,300 square-miles (approximately 800,000 acres) (Service 2003). The fragmented distribution of the NIDGS is a remnant of what may once have been a more continuous distribution from Round Valley, Valley County, north to New Meadows, west to Bear, and south to Indian Valley in Adams County, Idaho (Service 2003). All remaining habitat sites for this ground squirrel are small in relation to those of other species of ground squirrels, ranging from >1 to 44 hectares (>1 to 110 acres), and are threatened by forest encroachment into grassland meadows.

The PHD of the NIDGS, developed by the NIDGS Technical Working Group, delineates what is believed to be the species current and historical range. The PHD totals approximately 843,434 acres and overlaps the Payette and Boise National Forests (Figure 16), but currently the species is known to occur only on the Payette National Forest. In 1985, the total NIDGS population at 18 known population sites was approximately 5,000 squirrels (Yensen 1985, Service 1985). The species declined from an estimated 5,000 individuals in 1985, to less than 1,000 by 1998. Surveys conducted in 2001 estimated the population was from 250 to 500 animals. In 2007, the population estimate for NIDGS was 1,040 individuals (Evans-Mack 2008). Given the extremely low population numbers and disjunct and isolated condition of current habitat, population viability could be a concern for this species (Service 2003).

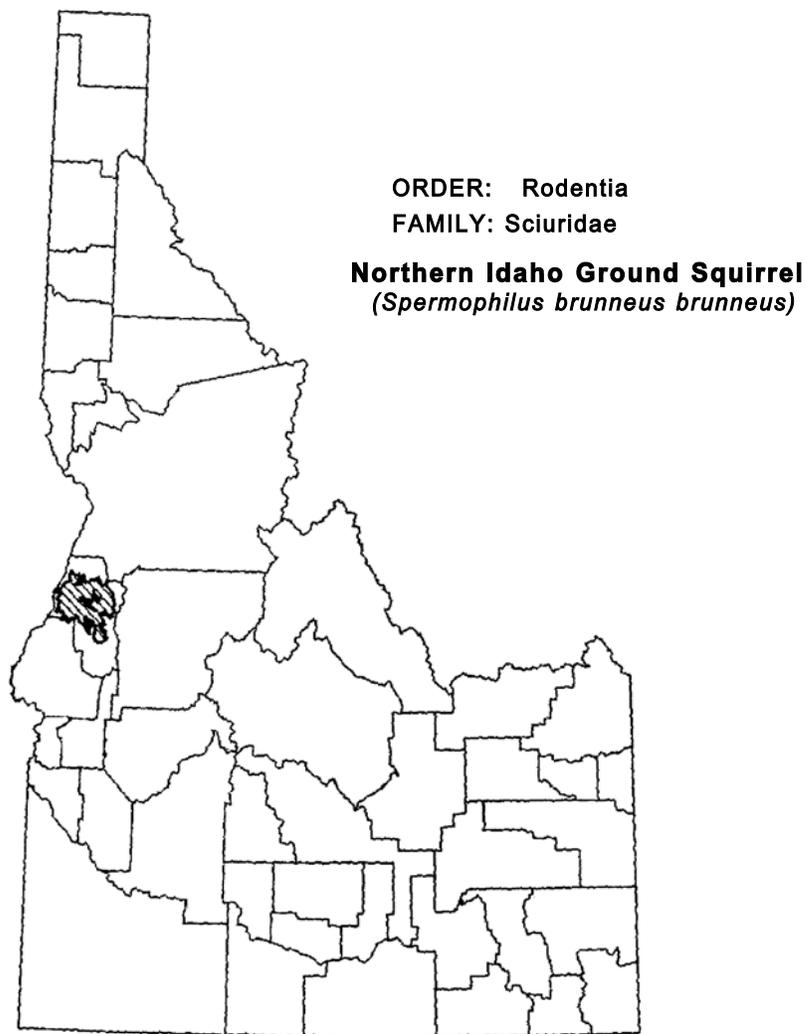


Figure 17. Current Distribution of NIDGS.

Metapopulation sites encompass clusters of population sites within the PHD. These sites were mapped by biologists conducting on-the-ground surveys to delineate elevation, slope, soil type, and other factors contributing to habitat that could be utilized by northern Idaho ground squirrels. Most of the known population sites fall within the metapopulation sites identified.

## Northern Idaho Ground Squirrel Probable Historic Distribution

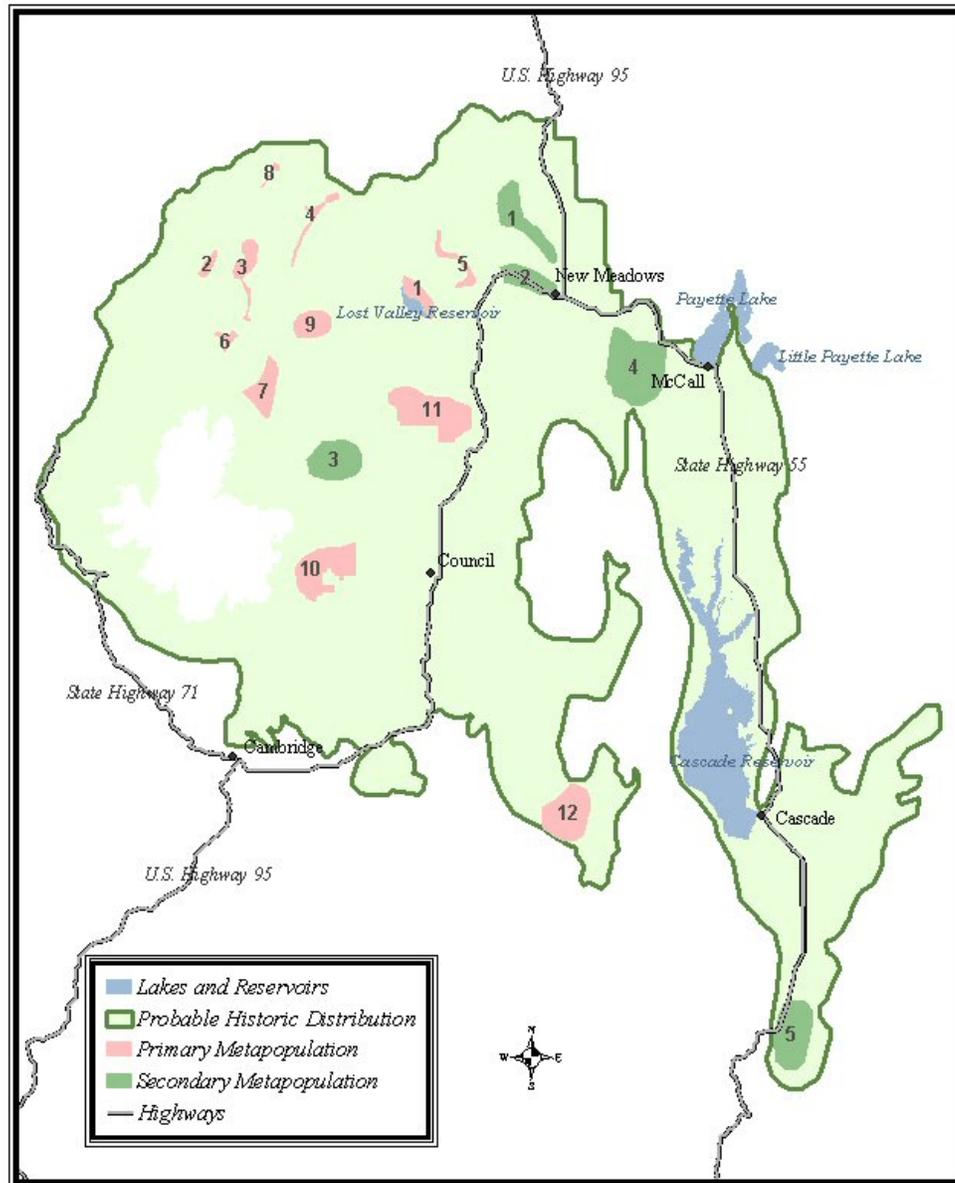


Figure 18. Probable Historic Distribution of NIDGS.

In a metapopulation system such as that of NIDGS, the extinction and re-colonization of local populations is perceived to be a natural occurrence. 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.” Additionally, 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.

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. 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.

Currently, NIDGS are still characterized by relatively high genetic diversity as a species, and only low to moderate differentiation between individual populations (Garner et al. 2005). Consequently, this subspecies does yet not appear to be exhibiting deleterious effects associated with small populations, such as inbreeding or loss of genetic diversity (Garner et al. 2005).

## 6. Previously Consulted-on Effects

The Service has conducted numerous informal and formal section 7 consultations with the Forest Service and other Federal agencies, in addition to the Forest Plan revision consultation. 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, no incidental take has been granted, and due to the nature of these actions (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). In summary, the Service’s 2003 Biological Opinion for the SWIE LRMPs developed the following assumptions with regards to Forest Plan implementation and NIDGS to avoid a jeopardy determination. The Service assumes that: 1) all actions proposed under this Forest Plan will benefit the recovery of the NIDGS, and 2) any adverse effects to the NIDGS will be short-term and completely off-set by long-term benefits.

## 7. Conservation Needs

In 1996, while still a candidate species, a Conservation Agreement between the Payette National Forest and the Service was developed to address this viability concern and encourage habitat

improvement opportunities. Prior to and since this agreement, the Payette National Forest has been implementing habitat improvement projects to decrease conifer encroachment on currently occupied sites, and to connect adjacent populations (Service 1996). These projects (e.g., Summit Gulch) appear to be beneficial to the squirrel, but are still being evaluated to determine their effectiveness.

Current conservation and management of NIDGS on the Payette and Boise National Forests is guided by the Final Recovery Plan for the Northern Idaho Ground Squirrel (Service 2003) and the Land and Resource Management Plans for the Boise, Payette and Sawtooth National Forests (USFS 2003). Additionally, other voluntary plans and agreements have been developed among State and Federal agencies to further enhance NIDGS conservation and recovery. These include: a Payette National Forest Habitat Restoration Plan for activities to be conducted to pro-actively enhance and restore habitat up to 2006; and a Participating Agreement between the Payette National Forest, Service, and the IDFG committing to the provision of long-term protection of the NIDGS (Service 2003).

The LRMPs for the SWIE Forests provide Forest-wide direction that pertains directly to NIDGS and additional Management Area direction for those areas where the NIDGS is known to occur (e.g., within Management Areas 2, 3, and 5 on the Payette National Forest). In general, this direction provides the minimum needs to promote conservation of the NIDGS through proactive maintenance and restoration of NIDGS habitat and minimization of effects to individual squirrels through restrictions on other management disciplines (e.g., grazing, recreation, fire) in occupied NIDGS habitat.

#### 8. Critical Habitat

No Critical Habitat for NIDGS has been designated, therefore none would be affected.

### **B. Environmental Baseline**

Regulations implementing the Act (50 CFR 402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area which have undergone formal section 7 consultation, and the impacts of State, tribal, local, and/or private actions that are reasonably certain to occur and are contemporaneous with the consultation in progress.

#### 1. Status of the Species in the Action Area

Of the approximately 843,434 acres encompassed by the PHD for NIDGS, 5.61 percent (47,313 acres) falls within Idaho Roadless Areas (IRA) (Figure 19). Of 40 known metapopulation sites (to be differentiated from colonies) for NIDGS within the PHD of the species, none occur within IRAs as of 2008. Four existing NIDGS colonies have been documented within IRA and include Bear-lick Ridgeline, Lick Creek Lookout, Lick Creek Lookout Lower, and the Smith Mountain Lookout (Table 35). These 4 colonies occur outside of the currently established metapopulation sites.

The PHD of the NIDGS overlaps five IRAs and include Indian Creek, Cuddy Mountain, Council Mountain, and small portions of Rapid River and Poison Creek (Figure 19). One additional IRA is situated between metapopulations (e.g., Snowbank) and seven IRAs surround the outer boundaries of the PHD (e.g., Bear Wallow, Peace Rock, Stony Meadows, Needles, French Creek, Patrick Butte, and Hells Canyon/Seven Devils Scenic Area). Based on the proximity of these thirteen IRAs to the PHD and metapopulation sites these IRAs could contain habitat that serves as linkage and/or connectivity between adjacent metapopulations and colonies or that supports yet to be discovered NIDGS colonies (Ray Vizgirdas, Service, pers. comm. August 25, 2008).

Much of the squirrel’s preferred meadow and natural opening habitat on the Payette National Forest has been managed in the past, but not in a way that has particularly benefited this species. Many areas adjacent to the meadows historically had large, widely spaced ponderosa pine and Douglas-fir that have been replaced by dense stands of younger trees with dense understories, which may inhibit movement of squirrels between colonies. Many of these meadows and openings have been invaded by trees due to past fire exclusion and grazing.

Table 35. Existing NIDGS colonies in Idaho Roadless Areas.

Colony Name	Status	2007 Population Estimate*		Acres in IRA	Roadless Area
		Observed	Min. Est.		
Bear-Lick Ridgeline	Extant	9	10	5.68	Rapid River
Lick Creek Lookout	Extant	21	25	14.21	Rapid River
Lick Creek Lookout Lower	Extant	0	undetermined	4.42	Rapid River
Smith Mountain Lookout	Extant	10	20	0.07	Hells Canyon/Devils Scenic

\*From Evans- Mack and Bond 2007.

## 2. Factors affecting the Species in the Action Area

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 illegal recreational shooting, poisoning, and competitive exclusion by the larger Columbian ground squirrel (Service 2003).

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;

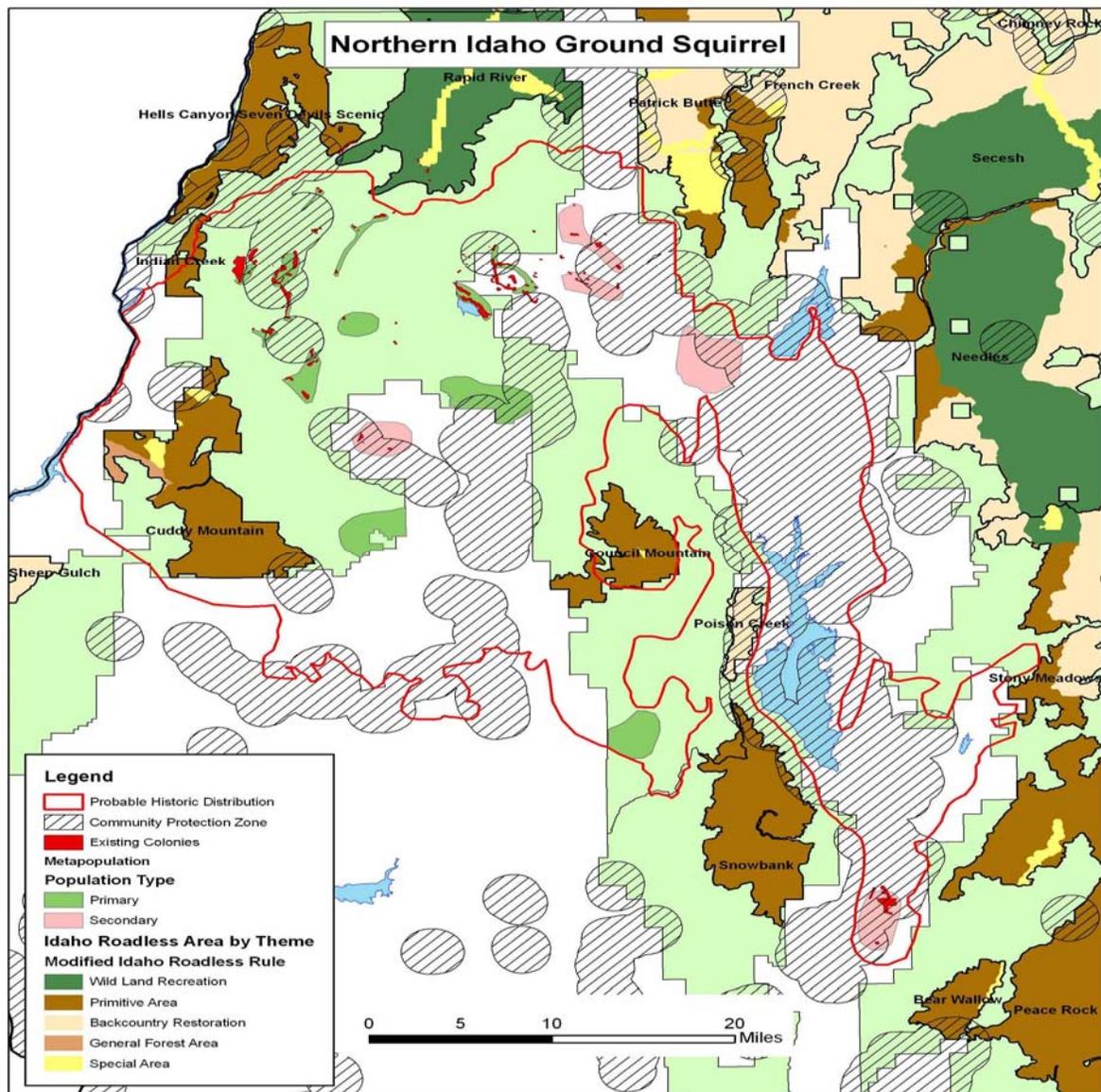


Figure 19. Overlap of MIRR Themes with NIDGS Probable Historic Distribution and Known Populations

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).

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. Again, past management activities, such as fire exclusion, may have modified these habitats (e.g., increased density of vegetation) resulting in a competitive advantage for the Columbian ground squirrel where the two species are in close proximity to one another. Such past management actions have reduced the sizes of the

meadows and eliminated dispersal corridors along the valley bottoms (Service 2003). Because of the current low population numbers and limited number of locations where animals are present, impacts to individual NIDGS from any cause are of concern.

### *Road Construction and Reconstruction*

As indicated above, the MIRR establishes prohibitions and permissions on road construction and reconstruction, and timber cutting activities across IRAs based on management area themes. Construction, maintenance, and use of forest roads have the potential to impact NIDGS through a number of mechanisms. Habitat can become inaccessible to individuals where roads function as a barrier to movement. For example, Merriam et al. (1988), Swihart and Slade (1984), and Oxley and Fenton (1974), found that some rodent species are reluctant to cross even the narrowest gravel roads. This avoidance behavior can result in substantial amounts of suitable habitat being unavailable to these species. Further, such habitat loss can fragment populations into smaller subpopulations through loss of connectivity between populations (Shine et al. 2004), which can lead to demography fluctuations, inbreeding, loss of genetic variability, and local population extinctions (Yensen and Sherman 1997).

Where roads function as barriers to movement, travel and dispersal, they can significantly alter population demographics and genetics of a species. Rico et al. (2007) found that whereas individual voles and mice were observed crossing narrow highways, wide highways served as complete barrier to movement, effectively separating populations on either side of the highway demographically. For NIDGS, increased habitat fragmentation between colonies could impact dispersal between these populations, which could lead to demographic consequences should such separation be maintained.

Roads facilitate human access and activities that could contribute to direct and indirect mortality of NIDGS, including collisions and crushing. In certain situations, such as for some rodents with highly restricted home ranges, populations or rare animals may be reduced to dangerous sizes by road kills (USFS 2000). Ground squirrels often are a target of recreational shooting, which is facilitated by human developments and road access (Service 2003, Ingles 1965). Many local endemic ground squirrels, such as the NIDGS, with small, isolated populations are vulnerable to recreational shooting facilitated by roads (Service 2003). 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).

### *Timber Cutting*

The NIDGS can be impacted by management of vegetative communities, including timber cutting. “[Although] the species does not make significant use of forested areas, short-term adverse impacts from timber management activities [could occur where] meadows are used as landings, staging areas, equipment parking, storage, and camps. Impacts to the squirrels from logging and or forest management are similar to those impacts discussed for prescribed fire described below. Logging activity, if implemented while squirrels are present and active above

ground, can trigger avoidance behavior and make them more susceptible to predation” (Service 2003, pg. 53).

The NIDGS are not typically abundant in meadows that contain a high density of small trees (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.

In addition to the Forest Plan direction that specifically addresses NIDGS conservation (Table 36), the SWIE LRMPs outline a variety of general goals, objectives, standards and guidelines that are intended to further avoid, minimize, or mitigate adverse effects to threatened, endangered, proposed, and candidate species, including NIDGS (Table 37). How this general Forest-wide direction is implemented will vary with species and location. For NIDGS, minimization measures might include reducing disturbance to NIDGS and its habitat, controlling noxious weeds, and excluding road construction through occupied NIDGS habitat or use of roads during periods where NIDGS are active.

Table 36. Existing conservation and management direction for NIDGS from the Land and Resource Management Plans for the Boise, Payette, and Sawtooth National Forests.

<b>Direction</b>	<b>Description</b>
TEPC Objective 14	Maintain or restore vegetative conditions that contribute to the recovery of northern Idaho ground squirrel habitat
Wildlife Resources Goal	Restore northern Idaho ground squirrel habitat quality, abundance, and connectivity to promote recovery of the species
Wildlife Resources Objective	Implement the recovery plan for the northern Idaho ground squirrel, when approved, to promote recovery of the species
Wildlife Resources Standard	The northern Idaho ground squirrel will receive priority consideration for all management activities that occur within their known occupied habitat. The intent of this standard is not to exclude all other activities within this habitat, but rather to reduce or minimize potential impacts to this species while emphasizing habitat improvement within and adjacent to known sites
Recreation Resources Standard	All new developed recreation facilities shall be located outside occupied NIDGS habitat.
Rangeland Resources Standard	Livestock salting shall be located outside occupied NIDGS habitat
Fire Management Standard	Once a Wildland Fire Situation Analysis (WFSA) is approved, heavy equipment shall not be used to construct fire lines within occupied NIDGS habitat unless: <ul style="list-style-type: none"> <li>a. The line officer or designee determines that imminent safety to human life or protection of structures is an issue; OR</li> <li>b. The incident resource advisor determines and documents an escaped fire would cause more degradation to occupied NIDGS</li> </ul>

	<p>habitat than would result from the disturbance of heavy equipment.</p> <p>c. In no case will the decision to use heavy equipment in occupied NIDGS habitat be delayed when the line officer or designee determines safety or loss of human life or protection of structures is at imminent risk.</p>
Fire Management Standard	<p>Once a WFSA is approved, incident bases, camps, helibases, staging areas, helispots, and other centers for incident activities shall be located outside of occupied NIDGS habitat unless the only suitable location for such activities is determined and documented by the line officer or designee to be within occupied NIDGS habitat. In no case will the decision to place these activities inside occupied NIDGS habitat be delayed when the line officer or designee determines safety or loss of human life or structures is at imminent risk</p>
Fire Management Standard	<p>Once a WFSA is approved, avoid delivery of chemical retardant, foam, or additives to all surfaces within occupied NIDGS habitat unless:</p> <p>a. The line officer or designee determines that imminent safety to human life or protection of structures is an issue; OR</p> <p>b. The incident resource advisor determines and documents an escaped fire would cause more degradation to occupied NIDGS habitat, than would be caused by chemical, foam or additive delivery to the habitat.</p> <p>c. In no case will the decision to avoid delivery of chemical retardant, foam or additives to occupied NIDGS habitat be delayed when the line officer or designee determines safety or loss of human life or protection of structures is at imminent risk</p>

Table 37. General goals, objectives, standards and guidelines outlined in the LRMPs for the Southwest Idaho Ecogroup that may serve to minimize adverse effects on NIDGS.

<b>Threats</b>	<b>Federal Action Management Direction in Chapter III of LRMPs</b>
Habitat Loss, Modification	<b>TEPC Species:</b> Goals 1, 3, 4, 5, 6; Objectives 1, 2, 3, 4, 5, 7, 14, 18, 22, 25, 26, 27; Standards 1, 2, 3, 5, 29; Guidelines 4, 6, 8, 10
Over-utilization	<b>TEPC Species:</b> Objectives 2, 5 <b>Wildlife Resources:</b> Objective 5,6 <b>Recreation Resources:</b> Standard 5
Disease or Predation	<b>Wildlife Resources:</b> Objectives 4, 5, 6

<p>Inadequacy of Regulatory Mechanisms</p>	<p><b>TEPC Species:</b> Goals 1, 3, 4, 5, 6; Objectives 1, 2, 3, 4, 5, 7, 14, 18, 22, 25, 26, 27; Standards 1, 2, 3, 5, 29; Guidelines 1, 2, 4, 6, 8  <b>Rangeland Resources:</b> Goal 1; Objective 1  <b>Recreation Resources:</b> Goals 4, 5; Objective 18; Standard 5  <b>Lands and Special Uses:</b> Goal 1; Objective 1; Guideline 1  <b>Facilities and Roads:</b> Goal 1; Objectives 4, 6; Guidelines 4, 9</p>
<p>Other Natural or Man-caused Concerns</p>	<p><b>TEPC Species:</b> Standard 5</p>

### C. Effects of the Proposed Action

The previous section presented factors and activities that can affect the NIDGS in the action area, some of which (particularly road construction, road reconstruction, timber cutting and discretionary mining) may also result from future actions undertaken as allowed by the MIRR. To minimize duplication, these potential effects are not reiterated in their entirety below, but are addressed specifically with regard to the proposed MIRR. Unlike most USFS project analyses of alternatives and environmental consequences, the analysis of the MIRR does not include an analysis of project implementation and resulting direct effects; it is an analysis of activities that could occur pursuant to the MIRR and the indirect and cumulative effects that could occur from those actions. It is an analysis of what is allowed under the rule versus an analysis of the on-the-ground activities, and therefore has no direct effects.

Approximately 5.61 percent (47,313 acres) of the PHD for NIDGS and some recently discovered colonies overlap IRAs (Table 38). Conditions under which road construction and reconstruction, and timber cutting could occur within IRAs vary with themes proposed by the MIRR. Generally, these themes rank in restrictiveness as follows (from most restrictive to least): WLR, PRIM and SAHTS, BCR, BCR-CPZ, and lastly GFRG. Approximately 1,000 acres of timber harvest (i.e., removal of a commercial product) and 3.3 miles of road are projected in IRAs per year across the entire state under the MIRR. The implications of these themes to NIDGS are as follows:

#### *Wild Land Recreation and Primitive*

Of the approximately 47,313 acres of the PHD that overlap IRA, 94 percent falls in IRAs that will be managed under relatively restrictive themes: WLR (31 acres) and PRIM (42,783 acres) (Table 38 and Figure 19). This overlap constitutes about 5.1 percent (42,814 acres) of the entire PHD. Three extant colonies overlap the WLR theme in the Rapid River Roadless Area and one colony overlaps the Primitive theme in the Hells Canyon/Seven Devils Scenic Roadless Area (Table 38).

Road construction and reconstruction is prohibited under both of these themes, unless provided for by statute or treaty, or pursuant to reserved or outstanding rights, or other legal duty of the United States. Therefore, under these themes, effects to NIDGS associated with road construction or reconstruction in NIDGS habitat (e.g., increased opportunities for vehicle-related

injuries and mortalities, as well as facilitation of unauthorized recreational shooting) are not anticipated to occur. Further, prohibition on new roads, temporary or permanent, should benefit the species in these areas by minimizing disturbance and human access.

Timber cutting, sale, or removal is generally prohibited in WLR except for personal or administrative uses, or where incidental to the implementation of management activities not otherwise prohibited. As such, adverse impacts to the NIDGS are not anticipated to occur under this theme resulting from timber cutting. Timber cutting is permitted, however, in PRIM in two additional circumstances: to improve habitat for TEPC species and to maintain or restore the characteristics of ecosystem composition and structure; or to reduce the risk of uncharacteristic wildland fire effects to an at-risk community or municipal water supply system. Such activities could only be facilitated using existing roads or aerial systems, and projects would have to meet certain additional criteria (e.g., retention of large trees, Regional Forester approval, etc.). Therefore, timber cutting activities (and related activities such as prescribed burning) could occur in PRIM where they are designed to restore or improve NIDGS habitat, such as removal of encroaching conifers into montane meadows. Such activities would likely have benign or long-term beneficial effects on NIDGS (Service 2003).

Table 38. Overlap of the Probable Historic Distribution (PHD) of the Northern Idaho Ground Squirrel and the Modified Idaho Roadless Rule.

<b>IRA Themes</b>	<b>Overlapping Colonies</b>	<b>Acres PHD</b>	<b>% of PHD</b>	<b>% IRA overlap</b>
Wild Land Recreation	Bear-Lick Ridgeline Lick Creek Lookout Lick Creek Lookout Lower	31	0.00%	0.07%
Primitive	Smith Mountain Lookout	42,783	5.07%	90.4%
Backcountry	None	0	0.00%	0.00%
Backcountry CPZ	None	1.49	0.00%	0.00%
General Forest, Rangeland, Grassland	None	2,675	0.32%	5.65%
Forest Plan Special Areas*	Bear-Lick Ridgeline	1,822	0.22%	3.85%
Total in IRA	4	47,313	5.61%	100%
Total Area of PHD		843,434		

\* The MIRR does not apply to these other special areas.

Watersheds that contain municipal water sources do occur within the PHD for NIDGS, and appear to overlap the following IRAs: Cuddy, Council Mountain, Snowbank, Needles, Peace Rock, Bear Wallows, Patrick Butte, and French Creek (Figure 19). Further, CPZs, which may include at-risk communities, also appear to overlap small portions of IRAs classified as PRIM within the PHD for the NIDGS (Figure 19). Therefore, timber cutting activities (including related activities such as prescribed fire) intended to reduce and remove hazardous fuels could

occur in these IRAs to protect municipal water sources or at-risk communities. At this time it is difficult to predict the nature of impacts such activities might have on NIDGS given the range of methods and possible prescriptions. However, the objective of fuels reduction is typically to remove ladder fuels and to create a more open stands, activities that could create conditions that are conducive to NIDGS. Short-term adverse effects could occur due to disturbance to individual squirrels or temporary changes in habitat quality. Furthermore, use of existing roads to facilitate such treatments has the potential to increase vehicle-related injury or mortality of NIDGS.

Road construction and reconstruction related to discretionary mining activities and surface occupancy are prohibited in WLR and PRIM. Consequently, effects associated with these activities on NIDGS (e.g., habitat loss, fragmentation, and degradation, increased human access) are not anticipated under these themes.

#### *Backcountry Restoration*

Approximately 1.49 acres of the PHD for NIDGS overlap BCR, entirely within CPZ in the Poison Creek Roadless Area. No known colonies of NIDGS overlap this theme at this time. Within BCR-CPZ, temporary roads could be constructed or reconstructed under six primary exceptions and to address hazardous fuels surrounding at-risk communities and municipal water supply systems. Timber cutting could also occur to reduce hazardous fuels within CPZ, reduce significant risk of wildland fire effects to an at-risk community, or municipal water supply system, and to address similar purposes as described under PRIM (e.g., improve TEPC species habitat, maintain characteristics of ecosystem composition and structure, etc.). Effects to NIDGS resulting from construction of temporary roads or timber cutting (as described under PRIM) could occur under BCR-CPZ. However, given the minimal degree of overlap between the PHD and this theme, it is highly unlikely that any activities that could occur in BCR-CPZ will take place in NIDGS habitat.

Road construction or reconstruction related to discretionary mining is not permitted in BCR. However, surface occupancy to facilitate extraction of leaseable minerals (e.g., oil and gas, geothermal) would be allowed where it is consistent with applicable forest plan direction. The likelihood of new leases for oil, gas, coal or geothermal development in IRAs, particularly outside of the Caribou-Targhee National Forest, is exceptionally low. This likelihood is further reduced under this theme without the ability to build new roads. Given the minimal degree of overlap between the PHD and this theme, it is highly unlikely that any activities that could occur in BCR-CPZ would take place in NIDGS habitat.

#### *General Forest, Rangeland, or Grassland*

Approximately 2,675 acres of the PHD fall into the designation of GFRG. This represents approximately 0.32 percent of the entire PHD, and approximately 5.65 percent of the PHD overlapping IRA. Additionally, there are no known colonies of NIDGS that exist within the IRA proposed as GFRG. However, not all areas within the PHD have been surveyed.

Road construction and reconstruction (forest or temporary), and timber cutting activities, including timber harvest (i.e., removal of a commercial product), are generally permitted in GFRG. Road construction or reconstruction related to discretionary mining is not permitted in GFRG, except where associated with phosphate deposits on the Caribou-Targhee National Forest. Surface use and occupancy to facilitate extraction of leaseable minerals (e.g., oil and gas, geothermal) in the Backcountry and GFRG themes would be permitted if allowed in the LRMP. However, new road construction and reconstruction associated with development of geothermal, oil, or gas reserves is prohibited in roadless areas under the MIRR regardless of theme. There are no known oil and gas deposits in west-central Idaho, and geothermal energy potential is very low. As such, little commercial interest in leasing for such resources is anticipated as development would essentially be precluded in the absence of new roads and there is low potential for the resource. Activities related to phosphate leasing in IRAs would be restricted to areas in and adjacent to specific Known Phosphate Leasing Areas (KPLAs) on the Caribou portion of the Caribou-Targhee National Forest. Consequently, the likelihood that discretionary mining activities will take place in IRAs related to discretionary mining on the Payette and Boise National Forests is exceptionally low.

Given the relatively few constraints on road construction and timber cutting in GFRG, NIDGS would have the highest potential to be impacted by these activities where its habitat overlaps this theme. This theme also does not prohibit surface occupancy for new mines that use existing road systems, and thus there is a small potential for mining-related impacts on NIDGS via habitat loss, degradation, and human access where future activities overlap the range of this species. However, as there are no known colonies documented within GFRG to date, the likelihood that individuals will be exposed to activities is relatively low.

#### *Applicable LRMP direction for NIDGS*

Implementation of any projects in IRA would require consistency with existing Forest Plan direction. These include specific goals, objectives, standards, and guidelines have been incorporated into the Forest Plans for the SWIE (Service 2003 Biological Opinion) to minimize adverse effects to the NIDGS and move the species towards recovery (Tables 36 and 37). Further, design features of projects currently proposed in modeled NIDGS habitat include surveys of the project area prior to ground disturbing activities, and limited operating procedures to avoid seasonal periods when NIDGS are above ground and active. Although most threats resulting from active management in NIDGS habitat (e.g. timber, etc.) are addressed by Forest-wide standards and guidelines, Management Prescription Category (MPC), or Management Area direction, those MPCs that emphasize active management (e.g., mechanical harvest, road construction, etc.) have a higher potential for temporary and short-term effects to habitat and individuals. This is based on the following rationale:

- First, as more active treatments are applied, more protective measures are needed to avoid or minimize potential adverse effects. It is assumed that as more protective measures are applied, the more risk there is of impacts from these measures, or of impacts from avoidance or minimization measures not being implemented correctly.

- Second, it is also assumed that the more management activities are applied to a specific location, the more the risk there is of impacts from those management disturbances, regardless of avoidance or minimization measures.

Finally, all activities proposed in IRA pursuant to the MIRR that may affect NIDGS in the future will be subject to subsequent section 7 consultation under Act with the Service. Use of prescribed fire is not directly addressed by the MIRR. However, this activity is typically paired with timber cutting activities intended to reduce fuels, which is addressed by the MIRR. 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). However, there is the potential for temporary adverse effects to NIDGS from prescribed fire due to disturbance and short-term changes in habitat quality immediately following treatments. Although it varies by commodity, surface use associated with the exploration and development of leasable minerals requires access and haul roads, open pits, facilities, power lines, pipelines, and communication sites, all of which can impact habitats for terrestrial species. For example, development of geothermal energy includes the following: exploratory drilling (some ground disturbance, road to access if not already there); if exploratory is favorable, construction of a well pad (about 3 acres); a power plant is needed within one to two miles, as well as pipelines which are above ground (Abing 2008). Development of oil, coal and gas plants require similar infra-structure components.

Generally, most of the impacts discretionary mining could have on terrestrial wildlife species, including NIDGS, will ensue from removal of the substrate for the mine footprint and required infrastructure, primarily road construction and development. The impacts resulting from these activities include habitat loss, degradation, fragmentation, and human disturbance. Development associated with mining operations can also facilitate increased human access into NIDGS habitat, which could contribute to increased mortality where recreational shooting of rodents, including NIDGS, is not prevented.

#### **D. Cumulative Effects**

Under the Act, cumulative effects are defined in 50 CFR 402.02 as: “those effects of future state and private activities that are reasonably certain to occur within the action area of the Federal Action subject to consultation.” A non-Federal Action is “reasonably certain” to occur if the action requires the approval of a state or local resource or land use control, such agencies have approved the action, and the project is ready to proceed. For Federal lands, state, Tribal, and local government actions could be in the form of legislation, administrative rules, or policy initiatives, or they could be actions proposed on non-federal lands that fall within the action area (e.g., inholdings). We do not anticipate cumulative effects to NIDGS resulting from state, Tribal, and local government actions for the following reasons:

- The action area for the MIRR consists of IRAs, most of which are unlikely to contain significant inholdings given their current roadless character, thus effects on such intervening non-Federal lands are unlikely;
- Given the broad scope of this Federal Action, it is not possible to determine specific state, private or local government legislation, administrative rules, or policy initiatives that would be reasonably certain to occur in IRAs.

## **E. Conclusion**

The Service has evaluated the current status of the NIDGS, the environmental baseline in the action area, effects of the proposed action, along with cumulative effects. Based on this analysis, the Service anticipates adverse effects from the proposed action on NIDGS, but it is our conclusion that the proposed activities allowed under the specific themes is not likely to jeopardize the continued existence of the species. This action would not reduce the reproduction, status, or distribution of the NIDGS to a point where the likelihood of its survival and recovery is appreciably reduced. It is the Service's opinion that these adverse effects will not rise to level of jeopardy to the species, based on the following rationale:

- Timber cutting activities and road construction and reconstruction in IRAs permitted under the MIRR, particularly in GFRG, have the potential to adversely affect individual NIDGS. Adverse effects might occur due to short-term habitat degradation or increased chance for mortality where new roads are constructed.
- At the project level, all activities will continue to utilize existing Forest Plan direction (see Tables 37 and 38) that are designed to avoid or minimize adverse effects to the small, isolated colonies of this species on Federal lands.
- Further, there is limited overlap of the NIDGS PHD (<6%) and few known NIDGS locations within IRA (4 known colonies) that would decrease the likelihood that NIDGS being exposed to activities that might have adverse impacts, and the risks these activities could pose to the species as a whole.
- However, because we cannot predict when and where future activities might take place, we can not discount the potential for short-term adverse effects to NIDGS habitat and the chance of increased mortality where roads intercept NIDGS habitat, as described above and by 2003 Forest Plan (USFS 2003) and associated Biological Opinion (Service 2003).

## **F. Incidental Take Statement**

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by Service to include significant habitat modification 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 an intentional or negligent act or omission which creates the likelihood of injury to listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(0)(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.

1. Amount or Extent of the Take – The risk of incidental take of NIDGS is not completely precluded by the MIRR, though following Forest-wide and Management Area Direction described in the LRMPs for the SWIE (Forest Plan) renders that risk to an extremely low level. The Service believes that the Forest Plan provides adequate guidance to assure that implementation of actions and programs would almost always have negligible risk of take of squirrels.

No incidental take of NIDGS is exempted herein as a result of the USFS adopting the MIRR, although specific actions developed pursuant to the MIRR and associated LRMPs may cause effects that constitute take. The mere potential for take is not a legitimate basis for providing such an exemption. Subsequent consultation, as appropriate, on specific actions developed pursuant to the MIRR and relevant provisions of LRMPs will serve as the basis for determining if an exemption from the section 9 take prohibitions is warranted. If so, the Service will provide Reasonable and Prudent Measures and Terms and Conditions, as appropriate, to minimize the impacts of the taking on the listed species in accordance with 50 CFR 402.14i.

2. Effect of the Take – Not applicable to this Opinion.

3. Reasonable and Prudent Measures and Terms and Conditions – Since no incidental take is anticipated, no Reasonable and Prudent Measures and Terms and Conditions are necessary.

## **G. 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 effects of a proposed action on listed species or critical habitat, to help implement recovery programs, or to develop information. These conservation recommendations were developed, in part, from the final Recovery Plan for the species and the Service's 2003 Biological Opinion (Service 2003), and they are included in the SWIE Forest Plans. They are presented here to highlight additional conservation needs for NIDGS.

1. Provide additional physical protection of NIDGS from mortality or injury caused by humans using roads or trails in potentially suitable habitats. This protection could be provided by (but not limited to) erecting signs, roads closures, off-road vehicle restrictions, and other measures to limit human disturbance to the species and their habitat.

2. In cooperation with the Service, prepare an outreach plan that allows the public to be updated on information on the conservation and biology of NIDGS. Inform the public of current habitat restoration and monitoring efforts on Forest Service lands.

3. In cooperation with others to secure protection of existing habitat from threats on adjacent private lands.
4. Working with the NIDGS Technical Working Group, cooperate in establishing and maintaining a database that tracks all known populations numbers and documents the geographic extent of NIDGS populations using a GIS. Past and present narrative data for the NIDGS should be collected and incorporated into a system that allows a crosswalk of narrative data with the GIS system data. These records and GIS habitat maps should be updated regularly.
5. To provide additional understanding of important characteristics of the NIDGS habitat, work with the Service and others to formulate a multivariate analysis of existing populations and their habitats. Environmental correlates of areas now occupied by the species should be analyzed statistically. All types of land use should be evaluated including mining, grazing, timber management, burning, cultivation, private land use and developments, highway construction, recreational, and utility uses.
6. Conduct a historical review of known pesticide applications within suitable NIDGS habitat on federal lands and adjacent private lands. Where possible, identify the initiating agency, amount of application, type of product, and target species.
7. Assist the Technical Working Group in evaluating population models for the species and re-affirm the accuracy of parameters in terms of population biology, habitat requirements, and other limiting factors. Update and refine existing information on population distribution, exchange rates between metapopulations, and genetic studies.
8. Assist others in establishing a long-term contingency plan to allow management procedures if the NIDGS population should reach critically low numbers or other special management needs are identified. This plan would consider the following:
  - a) guidelines and procedures regarding the potential for supplemental feeding and/or protection of existing food reserves;
  - b) a plan should be developed to take selected squirrels into captivity to develop propagation techniques should captive reproduction be needed in the future;
  - c) an emergency plan outlining strategies to be implemented in the event of catastrophic loss of habitat should be prepared.
9. Continue existing efforts to locate additional natural populations of NIDGS within the PHD of the species. Document the systematic search methods so all surveys are using similar techniques.
10. Assist in the development of management plans for each of the identified metapopulations of the NIDGS.