

## Northern Goshawk

**Northern Goshawk** (*Accipiter gentilis*)

### Management Status

**Heritage Status Rank:** G5S3

**Federal:** USDA Forest Service Region 5 Regional Forester's Sensitive Species.

**State:** California Department of Fish and Game Species of Special Concern;

**Other:** None

### General Distribution

Northern goshawk is holarctic in distribution, occurring across Eurasia and North America. In the western hemisphere, northern goshawk occurs from Alaska south and east across Canada and the northern United States, south through the western United States, and into south-central Mexico (Squires and Reynolds 1997).

In California, northern goshawk breeds in the North Coast Ranges, the Klamath and Warner Mountains, and south through the Cascades and Sierra Nevada (Zeiner and others 1990). Breeding has also been documented in the southern Los Padres ranges in the vicinity of Mount Pinos and Mount Abel (Stephenson and Calcarone 1999). Northern goshawk may also breed occasionally in the San Bernardino and San Jacinto Mountains, although this has never been documented (Stephenson and Calcarone 1999, Zeiner and others 1990).

### Distribution in the Planning Area

Rare in southern California, northern goshawks have been observed during the breeding season only on Mount Abel, Mount Pinos, and in the San Bernardino and San Jacinto Mountains. A pair with two young was observed in the vicinity of Mount Abel in June 1989, and an adult and one immature bird were observed at Mount Pinos in July 1991. Breeding has not been documented in the San Bernardino or San Jacinto Mountains, although goshawks have been observed in summer near Big Bear Lake, Arrowbear, and on Fish Creek in the San Bernardino Mountains as well as in Tahquitz Valley, Willow Creek, Skunk Cabbage, Humber Park, and Lake Fulmor in the San Jacinto Mountains (Garrett and Dunn 1981, Lentz 1993, Stephenson and Calcarone 1999).

## **Systematics**

There are three currently recognized but weakly differentiated subspecies that occur in North America. Only one of these, *Accipiter gentilis atricapillus*, occurs in California (Squires and Reynolds 1997).

## **Natural History**

### **Habitat Requirements**

Northern goshawks occur in a variety of coniferous forest communities in the western United States, primarily in ponderosa pine (*Pinus ponderosa*), Jeffrey pine (*P. jeffereyi*), mixed conifer, white fir (*Abies concolor*), and lodgepole pine (*P. contorta*). Nest stands are typically composed of large trees that have high canopy closure, are near the bottom of moderate hill slopes, and have a sparse understory. When foraging, northern goshawks utilize a wider range of forest types and conditions, but most populations still exhibit a preference for high canopy closure and a high density of larger trees. In Nevada, however, northern goshawks forage in open sagebrush habitats or perch in aspen stands to hunt ground squirrels in adjacent sagebrush (Squires and Reynolds 1997).

Nests in the western United States are typically built in coniferous trees, but can be built in deciduous trees as well. Coniferous trees used for nesting in the western portion of northern goshawk's range include ponderosa pine, Douglas-fir (*Pseudotsuga menziesii*), white fir, and lodgepole pine (Squires and Reynolds 1997). Nests are typically constructed in the largest tree in the stand (Hargis and others 1994, Reynolds and others 1982, Squires and Ruggiero 1996).

Large snags and downed logs are believed to be important components of northern goshawk foraging habitat because such features increase the abundance of major prey species (Reynolds and others 1992).

### **Reproduction**

Northern goshawks are monogamous. Pairs typically arrive at nesting territories by March (Beebe 1974, Reynolds and Wight 1978, Zirrer 1947) or early April (McGowan 1975), or they remain near nests year-round (Doyle and Smith 1994). Breeding typically begins in April and lasts into August.

Typically, two to four eggs are laid in April–May and incubated primarily by the female. Incubation lasts 36–41 days. Young fledge at approximately 35–42 days. Fledglings remain in the vicinity of the nest stand for an additional 3–4 weeks, during which time their parents continue to provide them with food (Squires and Reynolds 1997).

The proportion of goshawk pairs that breed each year is highly variable, ranging from 22 percent to 86 percent in northern Arizona over a 4-year period. Nest success (i.e., the percentage of pairs laying eggs

that successfully fledge young) ranges from 80 percent to 94 percent in most studies, while most populations fledge 2.0–2.8 young per successful nest (Squires and Reynolds 1997).

## **Survival**

Estimated survival rates of northern goshawks based on band recoveries (and assuming a 60 percent reporting rate) were 34 percent in year 1, 67 percent in year 2, 81 percent in years 3 and 4, and 89 percent thereafter. Estimated annual survival rates in northern Arizona from capture/recapture data were 68.8 percent and 86.6 percent, respectively, for males and females more than 1 year old (Squires and Reynolds 1997).

## **Dispersal**

Juvenile dispersal is abrupt. In northern Arizona, juvenile dispersal begins in early August and is complete by late August. In northern California, natal dispersal distances of 10, 15, and 62 miles (16.1, 24.2, and 100 kilometers) were observed. In northern Arizona, three males were observed breeding a mean distance of 9.9 miles (15.9 kilometers) from their natal sites, and three females were observed breeding 13.4 miles (21.5 kilometers) from their natal sites (Squires and Reynolds 1997).

Breeding dispersal can be difficult to determine in northern goshawks because they frequently move to alternate nests within their nesting territories. However, females tend to move further and more often between years than males, and the tendency to move between territories appears to vary across populations (Squires and Reynolds 1997).

## **Migration**

Northern goshawk migration patterns exhibit annual and geographic variation. The species is considered by some to be a partial migrant, with the numbers of migrants and distances traveled possibly dependent on food availability in breeding areas during winter. Some populations may undergo a limited altitudinal migration (Squires and Reynolds 1997).

## **Diet and Foraging**

Northern goshawks prey on a variety of animals, including but not limited to tree squirrels, hares, grouse, corvids, woodpeckers, and large passerines (Squires and Reynolds 1997). Prey may be cached on a branch or wedged between branches (Zachel 1985), primarily when nestlings are small and need frequent feedings (Schnell 1958, Squires and Reynolds 1997).

Goshawks are short-duration sit-and-wait predators, and often switch perches while searching for food. This species hunts in a variety of habitats, including forests, riparian areas, and open habitat (Squires and Reynolds 1997).

## **Territoriality/Home Range**

Northern goshawks exhibit territorial behavior toward conspecifics and other raptor species during the nesting season (Beebe 1974, Kostrzewa 1991) and have been known to attack people entering the nest stand (Dixon and Dixon 1938, Zirrer 1947). In North America, estimates of home range size vary from 1,408 to 8,649 acres (570–3,500 hectares) during the nesting season (Squires and Reynolds 1997), with male ranges being larger than female ranges (Hargis and others 1994, Kennedy and others 1994).

Northern goshawks have large area requirements; in the southern Cascade Mountains of northern California, territories were spaced at intervals of one per 1,500–2,400 acres (607–970 hectares) of conifer forest habitat (Woodbridge and Detrich 1994).

## **Predator-Prey Relations**

Adult and juvenile northern goshawks have been killed by other goshawks, great horned owls (*Bubo virginianus*), eagles (*Haliaeetus leucocephalus*, *Aquila chrysaetos*), martens (*Martes americana*), and wolverines (*Gulo luscus*). A variety of raptors are killed by goshawks, including red-tailed hawks (*Buteo jamaicensis*), short-eared owls (*Asio flammeus*), great horned owls, and long-eared owls (*Asio otus*) (Squires and Reynolds 1997).

## **Inter- and Intraspecific Interactions**

Goshawks are solitary outside the breeding season. This species has been reported to associate with other raptors during migration; however, goshawks are not considered to be a social species. Small birds may mob goshawks on occasion (Squires and Reynolds 1997).

## **Population and/or Habitat Status and Trends**

The status of northern goshawk populations in the western United States is poorly understood (Squires and Reynolds 1997). Data are difficult to interpret due to inherent biases in methodologies and irruptive migrations (63 Federal Register 35183, Titus and Fuller 1990). Although northern goshawks remain widely distributed throughout their historic range, current sampling techniques are inadequate to determine population status or trends of this species (63 Federal Register 35183).

## **Threats and Conservation Considerations**

General factors influencing the species habitat include activities that affect forest structure such as livestock grazing, fire suppression, timber harvest, and insect and disease outbreaks, competition, predation and disease (Graham and others 1999). Because of fire exclusion, insect and disease epidemics, timber harvest, livestock grazing, or a combination of these factors the forests and woodlands of many parts of the west have changed drastically since the early 1900 's. One of the greatest impacts on habitat loss may be the lack of fire within the ecosystem (Graham and others 1999). The present

conditions of the forests and woodlands of older aged forests are prone to insect and disease epidemics in addition to the risk of stand replacing fires.

More information is needed on where goshawks may nest in the mountains of southern California. The breeding population is clearly small. It's not known why goshawk numbers are so low in southern California. Efforts to maintain the integrity of breeding territories of northern goshawks cannot be made until their locations are known. To ensure the goshawk's existence will require the restoration of these degraded habitats and the protection of native processes. Protection of mature conifer forest habitats from stand-replacing fire will be important to maintaining goshawks in this region (Stephenson and Calcarone 1999).

The following is a list of conservation practices that should be considered for the northern goshawk:

- Actively treat fuels to help prevent large, high intensity stand replacement wildland fire.
- Retain large trees in vegetation management projects.
- Retain snags and down logs for prey species.
- Cooperate with goshawk researchers to better understand goshawk distribution and habitat use in southern California.
- When conducting vegetation management, maintain a minimum of 200 acres of suitable canopy cover around identified goshawk nest sites. Maintain seasonal restrictions limiting activities within 1/4 mile of the nest site during the breeding season (approx. 2/15 - 9/15) unless surveys confirm northern goshawks are not nesting.

### **Evaluation of Current Situation and Risk**

Northern goshawks nest rarely in the mountains of southern California if at all. There is evidence of nesting on the Los Padres, and summer observations in the other higher mountain ranges. Some work is currently underway to better understand the goshawk distribution and habitat use in the state. Until more information is found it is difficult to manage for the protection of this species and its habitat. Threats thought to be a concern for goshawk populations – grazing in timber, habitat loss, timber or mortality harvest, are not widespread on the national forest in southern California. The greatest concern is the prevention of large scale wildfire plus the restoration of forested vegetation types. Both of these concerns are being addressed by current and future vegetation treatment projects that are planned to reduce the threat and risk of wildfires to the ecosystem and communities.

**Based upon the above analysis this species has been assigned the following risk category:**

4. Uncommon and disjunct in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

### **Viability Outcome Statement**

Though the northern goshawk is uncommon within its geographic range and often occurs in inaccessible habitats, there are some impacts that could occur to undetected occurrences from management activities occurring within a nest territory during the nesting period. The direct and indirect effects from national forest management activities on species-at-risk, by alternative, are described in the FEIS. As described above (Evaluation of Current Situation and Threats), there are no substantial threats to the distribution or persistence of the northern goshawk. Variations in land use designations would not alter this current situation and the various emphases of the alternatives would not result in a substantial change in conditions for the northern goshawk. The northern goshawk would remain distributed across its limited geographic range on National Forest System lands under all alternatives. By maintaining the current distribution of the northern goshawk on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause the northern goshawk to suffer a decline in its overall distribution. The threat category of 4 will remain the same through all alternatives.

## Literature Cited

- Beebe, F.L. 1974. *Goshawk*. In: Field studies of the falconiformes of British Columbia. British Columbia Provincial Museum Occasional Paper Series No. 17; 54-62
- Dixon, J.B.; Dixon, R.E. 1938. *Nesting of the western goshawk in California*. Condor 40: 3–11.
- Doyle, F.I.; Smith, J.M.N. 1994. *Population responses of northern goshawks to the 10-year cycling in numbers of snowshoe hares*. Studies in Avian Biology 16: 122–129.
- Garrett, K.; Dunn, J. 1981. *Birds of southern California: Status and distribution*. Los Angeles, CA: Los Angeles Audubon Society.
- Graham, Russell T.; Rodriguez, Ronald L.; Paulin, Kathleen M.; Player, Rodney L.; Heap, Arlene P.; Williams, Richard. 1999. *The northern goshawk in Utah: Habitat assessment and management recommendations*. General Technical Report RMRS-GTR-22. Ogden, UT: Rocky Mountain Research Station, Forest Service, U.S. Department of Agriculture; 48 p.
- Hargis, C.D.; McCarthy, C.; Perloff, R.D. 1994. *Home ranges and habitats of northern goshawks in eastern California*. Studies in Avian Biology 16: 66–74.
- Kennedy, P.L.; Ward, J.M.; Rinker, G.A.; Gessaman, J.A. 1994. *Post-fledgling areas in northern goshawk home ranges*. Studies in Avian Biology 16: 75–82.
- Kostrzewa, A. 1991. *Interspecific interference competition in three European raptor species*. Ethology, Ecology, Evolution 3: 127–143.
- Lentz, J.E. 1993. *Breeding birds of four isolated mountains in southern California*. Western birds 24: 201–234.

- McGowan, J.D. 1975. *Distribution, density, and productivity of goshawks in interior Alaska*. Federal Aid Wildlife Restoration Project Report W-17-4, W17-5, W-17-6, Job 10.6A. Alaska Department of Fish and Game.
- Reynolds, R.T.; Graham, R.T.; Reiser, M.H.; Bassett, R.L.; Kennedy, P.L.; Boyce, D.A., Jr; Goodwin, G.; Smith, R.; Fisher, E.L. 1992. *Management recommendations for the northern goshawk in the southwestern United States*. General Technical Report RM-217. USDA Forest Service.
- Reynolds, R.T.; Wight, H.M. 1978. *Distribution, density, and productivity of accipiter hawks breeding in Oregon*. *Wilson Bulletin* 90: 182–196.
- Reynolds, R.T.; Meslow, E.C.; Wight, H.M. 1982. *Nesting habitat of coexisting accipiter in Oregon*. *Journal of Wildlife Management* 46: 124-138.
- Schnell, J.H. 1958. *Nesting behavior and food habits of goshawks in the Sierra Nevada of California*. *Condor* 60: 377–403.
- Squires, J.R.; Reynolds, R.T. 1997. *Northern goshawk* (*Accipiter gentilis*). In: Poole, A.; Gill, F., eds. *The birds of North America*, No. 298. Philadelphia, PA: The Academy of Natural Sciences, and Washington, DC: The American Ornithologists' Union.
- Squires, J.R.; Ruggerio, L.F. 1996. *Nest-site preference of northern goshawks in south-central Wyoming*. *Journal of Wildlife Management* 60: 170–177.
- Stephenson, J.R.; Calcarone, G.M. 1999. *Southern California mountains and foothills assessment: Habitat and species conservation issues*. General Technical Report GTR-PSW-175. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture.
- Titus, K.; Fuller, M.R. 1990. *Recent trends in counts of migrant hawks from northeastern North America*. *Journal of Wildlife Management* 54: 463-470.
- Woodbridge, B.; Detrich, P.J. 1994. *Territory occupancy and habitat patch size of northern goshawks in the southern Cascades of California*. *Studies in Avian Biology* 16: 83–87.
- Zachel, C.R. 1985. *Food habits, hunting activity, and post-fledgling behavior of northern goshawks* (*Accipiter gentilis*) *in interior Alaska*. Fairbanks: University of Alaska. M.S. thesis.
- Zeiner, D.C.; Laudenslayer, W.F., Jr.; Mayer, K.E.; White, M., eds. 1990. *California's wildlife. Volume II: Birds*. Sacramento, CA: California Statewide Wildlife Habitat Relationships System, California Department of Fish and Game.

Zirrer, F. 1947. *The goshawk*. Passenger Pigeon 9: 79–94.

---

**Nashville Warbler**

**Northern Pygmy Owl**