

SPECIES PROFILE

Northern Goshawk

Accipiter gentilis

Federal Listing: Not listed

State Listing: Not listed

Global Rank: G5

State Rank: S3

Authors: Mariko Yamasaki and Christine, A. Costello, USDA Forest Service

ELEMENT 1: DISTRIBUTION AND HABITAT

1.1 Habitat Description

Northern goshawk breeding home range consists of nesting areas, post-fledgling family areas, and foraging areas (Reynolds et al. 1992). All goshawk breeding activity, from courtship to fledging, centers around the nesting area, which includes the nest tree and surrounding stands that contain prey handling areas, perches, and roosts. In New Hampshire, white pine (*Pinus strobus*), paper birch (*Betula papyrifera*), yellow birch (*Betula alleghaniensis*), Big-toothed aspen (*Populus grandidentata*), and red maple (*Acer rubrum*) are common nesting trees. These stands tend to be mature, containing some large diameter trees, and have relatively dense canopies and open understories. Most have been somewhat disturbed. Nest sites are generally situated close to the bottom of gentle slopes, most below 1,500 ft.

Nests are constructed in large trees with dominant and co-dominant positions in the canopy, but are not necessarily the largest trees in the stand. A nest tree must contain a branching structure suitable for holding a large bulky stick nest. Goshawks will often maintain 1 to 8 alternate nests within their nesting areas (Yamasaki and Costello, unpublished data, Speiser and Bosakowski 1987, Reynolds et al. 1994). Nest trees are often situated close to some type of forest opening (e.g., small breaks in the canopy, trails, forest roads, and upland openings).

The post-fledgling-family area is the area surround-

ing the nest site used by both adults and juveniles after fledging and until juvenile independence (Reynolds et al. 1992). This area is similar to nesting habitat and is believed to be critical in providing extra cover and abundant prey for unskilled juveniles. Research from the western United States suggests that the post-fledgling-family area varies in size from 121 to 243 hectares (300 to 600 acres), probably due to variation in food availability (Reynolds et al. 1992, Kennedy et al. 1994, Daw and DeStefano 2001).

Goshawk foraging areas consist of large tracts of forestland containing a variety of forest age classes and openings that can support the diverse habitat requirements of important goshawk prey species (Reynolds et al. 1992). These species include ground and tree squirrels, game birds, medium to large-sized songbirds, corvids, rabbits, and hares (Reynolds et al. 1992, Bosakowski et al. 1992, Boal and Mannan 1994, Doyle and Smith 1994). Much research suggests that goshawks forage in closed canopy forests with open under stories where prey is accessible, but that younger stands and openings are important for prey production. Critical winter goshawk habitat in eastern North America is unknown.

1.2 Justification

Concern exists for the goshawk because of their association with large tracts of forests that are being converted to other uses in New Hampshire. New Hampshire is the fastest growing state in New England, and forestland has declined by 134,500 acres (2.7 percent) since 1983. Southern New Hampshire has experienced the greatest decline (Frieswyk and Widmann 2000). Development and changes in ownership divide forest into smaller parcels, compromising goshawks by reducing the availability of nest sites and prey species. Fragmented landscapes may also increase competition with other raptors such as

great horned owls and red tailed hawks, which are better adapted to foraging and nesting in these areas (Crocker-Bedford 1990). Current habitat management guidelines were developed in other regions and are not applicable here due to differences in land-use patterns, forest cover type, disturbance regimes and available prey species.

1.3 Protection and Regulatory Status

Goshawks are protected under the Migratory Bird Treaty Act of 1918.

1.4 Population and Habitat Distribution

Goshawks breed throughout New Hampshire (Janeway in Foss 1994), though data on population dynamics are lacking. Passenger pigeon extirpation and extensive land clearing in the nineteenth century likely caused goshawk populations to decline, but subsequent agriculture abandonment and reforestation have likely contributed to a goshawk range and population expansion (Bent 1937, DeGraaf and Yamasaki 2001, Speiser and Bosakowski 1984, DeStefano in press).

1.5 Town Distribution Map

Not completed for this species.

1.6 Habitat Map

1.7 Sources of Information

Information on goshawk habitat, population distribution, and status was compiled from unpublished data from on-going research, scientific literature, limited agency data, surveillance of the New Hampshire bird list-serve, as well as from direct searches.

1.8 Extent and Quality of Data

There are no systematic goshawk sampling efforts in New Hampshire. Breeding bird surveys, hawk watches, and Christmas bird counts do not adequately survey for the seasonal and elusive goshawk. The objectives of current research efforts focused in the White Mountain region by the Northeastern Research Station are to locate breeding territories and describe nesting habitat and do not address de-

mographics. Minimal funding results in inconsistent surveying and monitoring.

1.9 Distribution Research

- Develop a statewide broadcast monitoring program for goshawk that will be regionally viable. Although time consuming and labor intensive, broadcast surveys are the best method available and can be used to monitor areas for occupancy, changes in distribution and abundance, and nest location. Data on distribution are most essential in areas expected to experience the most severe habitat loss.
- Develop a survey method or make use of existing surveys (e.g., Christmas Bird Counts, Feeder Watches) to obtain an index of winter abundance and distribution in the state.
- Test a rapid assessment process developed by USDA Forest Service Wildlife Ecology Unit (Hargis and Woodbridge in press) in New Hampshire and the northeastern United States.

ELEMENT 2: SPECIES/HABITAT CONDITION

2.1 Scale

Goshawk occurs across the state. Potential conservation planning units at the section (M212A, M212B, and 221A) or subsection level appear to be most appropriate (Avers et al. (1994).

2.2 Relative Health of Populations

There are no data on the abundance of goshawk in New Hampshire.

2.3 Population Management Status

There are no population management efforts in the state.

2.4 Relative Quality of Habitat Patches

There are no data for meaningful analysis.

2.5 Habitat Patch Protection Status

Goshawk nesting areas on the WMNF and other conservation lands in New Hampshire will remain pro-

ected. Nesting potential on non-conservation lands will depend on whether these lands remain forested.

2.6 Habitat Management Status

There are no habitat management or restoration efforts in New Hampshire.

2.7 Sources of Information

There are no statewide or regional data upon which to assess the condition of goshawk.

2.8 Extent and Quality of Data

There are no data available to make this assessment.

2.9 Condition Ranking

There are no data for this ranking.

2.10 Condition Assessment Research

- Determine home range sizes and characterize breeding and foraging habitat at landscape, stand, and within-stand scales.
- Determine how changes in forest structure and landscape patterns affect reproductive success, survival rates, territory fidelity, juvenile dispersal, and breeding dispersal
- Determine important prey species of goshawk in this region and determine how the abundance and availability of prey is influenced by forest structure, management practices, landscape patterns, and natural cycles
- Identify effects of various forest management practices on goshawk habitat, nest site fidelity, productivity, and prey availability
- Determine migratory status of goshawks breeding in New Hampshire and winter survival rates of adults and juveniles
- Characterize goshawk winter habitat
- Determine if West Nile Virus is affecting goshawk populations New Hampshire

ELEMENT 3: SPECIES AND HABITAT THREAT ASSESSMENT

3.1.1 Development (Habitat Loss and Conversion)

(A) Exposure Pathway

Development reduces the number and distribution of available nest sites and foraging habitat. Additionally, these activities can increase populations of goshawk predators such as raccoons and great horned owls.

(B) Evidence

White pine and northern red oak can consistently be regenerated in outwash sand and gravel sites (Leak 1982). White pine stands are frequently used for nesting sites by goshawks, and these stands tend to have soils that are moderately to excessively well-drained, making them ideal for both residential and commercial development. Forest planners have expressed concern over the disproportionate conversion of white pine and red oak sites in the last 20 years (Cullen and Leak 1988).

3.2 Sources of Information

Information on threats to the northern goshawk came from a literature review of research conducted outside of the northeastern United States as well as from research conducted by the Northeastern Research Station in the White Mountain region, and personal communications.

3.3 Extent and Quality of Data

Most of the existing data on threats to the goshawk come from areas outside of the northeastern United States and may not be relevant due to differences in land-use, forest cover types, disturbance regimes, and available prey species. Not enough is known about best forest management practices within goshawk nesting habitat or about this raptor's tolerance to disturbance during the breeding season.

3.4 Threat Assessment Research

- Determine the effect of land conversion and consequent habitat loss on goshawk productivity in historical goshawk nesting areas (i.e., compare gos-

hawk productivity in areas where land conversion and parceling processes are minimal, such as the White Mountain National Forest, to areas where the rate of land conversion is high)

- Evaluate the relationships between timber harvesting practices and nesting habitat, post-fledgling-family habitat, and foraging habitat
- Determine effects of human disturbance in goshawk nesting areas during the breeding season
- Monitor the development of West Nile Virus in forest raptors such as goshawk

ELEMENT 4: CONSERVATION ACTIONS

4.1.1 Developing occurrence, habitat, and distribution data, Restoration and Management.

(A) Habitat Loss

(B) Justification

- State-wide surveys will provide distribution and habitat survey data upon which population analyses can be conducted
- Statewide surveys can be followed by closer investigation of hemlock-hardwood-pine, northern hardwood-conifer, Appalachian oak-pine, and lowland spruce-fir types
- Investigations that increase knowledge of goshawk demographics and habitat availability (or degradation) will allow for better management

(C) Conservation Performance Objective

Census surveys in likely habitat will provide more information on a poorly understood species and will allow testing of habitat alteration hypotheses. Ecological studies will help determine the urgency of threats to the goshawk.

(D) Performance Monitoring

There is no statewide or regional monitoring of goshawk. Before conservation can occur, surveys must establish species occurrence and must determine whether habitat alteration is a significant threat.

(E) Ecological Response Objective

There are no data with which to formulate any type of ecological response objective.

(F) Response Monitoring

There are no data with which to formulate any type of response monitoring.

(G) Implementation

There are opportunities to partner with USDA Forest Service, UNH, United States Department of the Interior Fish and Wildlife Service, industrial forestry concerns, New Hampshire Division of Forest and Lands, NHNHB, local land trusts, and NHA to test the rapid assessment protocol suggested by Hargis and Woodbridge (in press) state-wide. Opportunities also exist to extend population and habitat research being conducted by USDA Forest Service, Northeastern Research Station statewide.

(H) Feasibility

The USDA Forest Service and UNH wildlife faculty have been conducting low intensity, non-systematic goshawk surveys in likely habitats since 1995 in the White Mountains region. Much cooperation and coordination would be required to accomplish a more systematic approach statewide, but it could be accomplished with adequate funding and the commitment of personnel and resources.

4.2 Conservation Action Research

Continuing support for ongoing goshawk population and habitat work in the White Mountains region and expanding these efforts state-wide would allow the direct testing of the habitat alteration hypothesis. Such surveys and habitat assessments are needed to better describe the status of goshawk and the characteristics of those habitats where goshawk occurs (e.g., associated vegetative communities, habitat condition indicators, any positive or negative forest management and recreational threats to habitat).

ELEMENT 5: REFERENCES

5.1 Literature

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5.2 Data Sources

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Distribution of Northern Goshawk in New Hampshire

Distribution

-  Known
-  Potential
-  Historic



0 10 20 40 Miles

Known = confirmed breeding observations from US Forest Service surveys.
Potential = possible breeding and other observations from the NH Breeding Bird Atlas, Audubon Society of New Hampshire.
Historic = observations greater than 20 years old.

