

Appendix A: Birds

Bald Eagle

Haliaeetus leucocephalus

Federal Listing	N/A
State Listing	T
Global Rank	G4
State Rank	S2
Regional Status	



Photo by Jason Lambert

Justification (Reason for Concern in NH)

Bald Eagle populations in the conterminous United States entered a severe population decline in the 1950s, largely a result of reproductive failure induced by biomagnification of the insecticide DDT (Buehler 2000). Some regional breeding populations, especially in eastern and southern states, became locally extirpated. This serious decline led to the designation of the bald eagle as Endangered under the Endangered Species Act. Following the banning of DDT and intensive reintroduction efforts, Bald Eagle populations gradually rebounded, and the species was removed from the federal endangered list in 2007. In the Northeast, recovery has been particularly strong since 2000. However, most states still consider Bald Eagle a SGCN due to historic extirpations and historic sensitivity to certain environmental stressors, particularly contaminants.

Distribution

Bald eagles currently occur and breed in all Lower 48 states and in Alaska. Based upon data provided by state agencies, from a population low of 417 breeding pairs in 1963 the U.S. Fish and Wildlife Service estimated that there were an estimated 1,500 breeding pairs in the contiguous 48 states in 1982 and an estimated 5,300 pairs in the same area in 1997 (derived from data in Buehler 2000), and nearly 9800 breeding pairs in the Lower 48 states in 2006. The USFWS estimated that there were 463 breeding pairs in the six New England states in 2006. The nationwide population has probably increased substantially since 2006, but more recently compiled information is not available from USFWS. Bald eagles were federally delisted in 2007. Post-delisting monitoring was implemented beginning in 2009, and consists of sampling sub-populations once every five years for 20 years (2009, 2014, 2019, 2024).

Wintering populations in the continental United States, which include thousands of individuals that breed in Canada, have shown similarly dramatic increases, from an estimated 13,800 individuals in 1982 to an estimated 26,100 individuals in 1997 (Buehler 2000). In the northeastern states, breeding bald eagle population recovery has been led by the states of Maine and New York, which supported 94% of the 459 territorial bald eagle pairs documented in the northeast in 2004. However, since federal delisting in 2007, it has become increasingly difficult to find reliable comprehensive summary data on bald eagle populations.

In New Hampshire in 2014, there were 41 breeding territories distributed widely across the state (figure 1), including in the Androscoggin, Connecticut, and Merrimack River watersheds. From 1988 through 2014, there was a total of 206 active nesting attempts documented in the state, 159 (77%) attempts were successful, resulting in 274 fledglings (1.33 young per active nest).

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New Hampshire has participated in the national midwinter survey since 1981 (Steenhof 2002), surveying major wintering areas along the Androscoggin, Connecticut, and Merrimack rivers, as well as the state's Lakes Region and Great Bay/Seacoast area, and other portions of the state where eagles winter in lesser numbers. The number of individual eagles documented in the midwinter survey has risen from an average of 8 individuals detected during the 1981 through 1984 surveys, to an average of greater than 43 individuals from 2001 through 2004 surveys, to nearly 79 individuals from 2011 to 2014.

Habitat

Bald Eagles breed in association with a wide range of aquatic habitats such as lakes, rivers, reservoirs, and coastal estuaries (Buehler 2000). Except for coastal Alaska and parts of northern Canada, where they nest on cliffs or on the ground, eagles nest primarily in forested areas, typically near large water bodies, in mature trees near forest edges, or in super-canopy trees within more uniform forest cover. Distances between nests and water bodies are variable, but are often less than two km. Proximity to foraging areas that harbor abundant, diverse, accessible prey may be a more important factor than actual distance from water. In 2014, 33 of 34 known bald eagle nest structures documented in New Hampshire were in white pines (97%), although cottonwoods or red oaks have also been used infrequently from 1988 to 2014.

During the non-breeding season, Bald Eagles are generally associated with open water, although as opportunistic foragers they will also occur far from water if sufficient food (e.g., carrion) is available. Other important habitat features in the winter include suitable roost sites, where several eagles may congregate in areas with good thermal cover and protection from disturbance.

Populations in different parts of their continent-wide range exhibit variable migratory behaviors, depending on age, breeding status, geographic location of breeding area, and year-round availability of food sources. While territorial on their breeding sites, eagles frequently assemble in higher densities on preferred wintering areas. Such places offer a combination of readily available food and roost sites with good thermal cover and protection from disturbance. Breeding adults from territories in interior Canada typically leave breeding areas for the winter months. Adults breeding in the northern United States often remain on or near breeding territories year-round, while juveniles and non-territorial immatures tend to migrate away from natal areas.

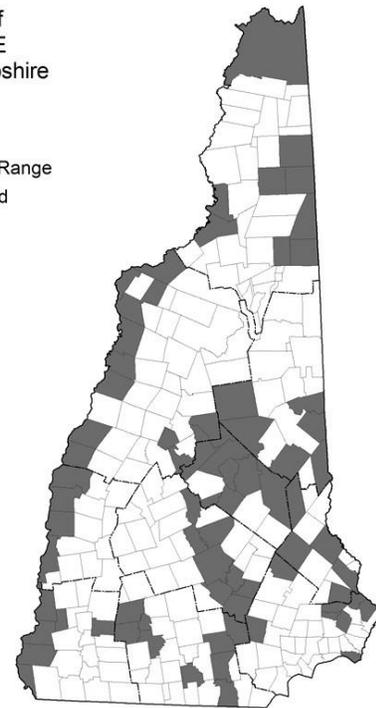
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NH Wildlife Action Plan Habitats

- Large Warmwater Rivers
- Warmwater Rivers and Streams
- Appalachian Oak Pine Forest
- Coldwater Rivers and Streams
- Floodplain Habitats
- Hemlock Hardwood Pine Forest
- High Elevation Spruce-Fir Forest
- Lowland Spruce-Fir Forest
- Marsh and Shrub Wetlands
- Northern Hardwood-Conifer Forest
- Warmwater Lakes and Ponds

Distribution of
BALD EAGLE
in New Hampshire

■ Current Range
▨ Localized



Distribution Map

Current Species and Habitat Condition in New Hampshire

From a single pair at Lake Umbagog from 1988 to 1997, New Hampshire's breeding Bald Eagle population has grown considerably, doubling every five years. As of 2014, there were at least 41 breeding territories in the state, up from ten in 2005. The number of eagles wintering in the state (based on a mid-January survey) has increased threefold in the same time period – from 32 in 2005 to 90 in 2015 (NH Mid-winter Bald Eagle Survey data, <http://gis.nacse.org/eagles/>). Statewide bald eagle productivity has improved from 11 young fledged in 2005 to 41 young fledged in 2014. Productivity per active nest increased from 1.05 young/year over the period 1988-2004 to 1.44 young/year in 2005-2014.

Bioaccumulation of chemical contaminants is a major concern in high trophic-level predators, such as bald eagles (Dominguez et al. 2003, Evers 2005, Welch 1994). Cooperative studies have assessed mercury levels in northern New England's bald eagle nestlings (DeSorbo et al. 2009). These studies have found mercury present in low to moderate levels in most nestling eagles.

Population Management Status

Ongoing management strategies for bald eagles in New Hampshire fall into 4 main categories:

(1) Locate territorial pairs

In collaboration with NHFG, NHA biologists solicit and evaluate public reports of bald eagles in areas of potential breeding habitat and follow up with field surveys to identify occupied territories.

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(2) Monitor and manage nesting attempts and wintering areas

Nesting attempts are monitored by trained volunteers observers and NHA staff biologists. NHA staff installed sheet metal predator guards around the bases of nest trees to deter tree-climbing mammalian nest predators and increase nesting success. NHA staff and trained volunteers monitor numbers and distribution of bald eagles in winter foraging and roosting areas through participation in the national Mid-winter Bald Eagle Survey coordinated by USGS.

(3) Manage human activity at breeding and wintering sites

In collaboration with NHFG, NHA biologists evaluated potential negative impacts of human recreation on nesting sites and implemented temporary closures when appropriate. In situations where the volume of boating or pedestrian activity threatens to jeopardize the nesting attempt, land-based or floating signs have been placed to create a buffer zone around the nest area. The NHA staff assists NHFG personnel with implementation of appropriate closures and landowner outreach strategies at important winter roost sites.

(4) Public outreach and education

Disseminating information on the goals, objectives, and status of bald eagle conservation efforts in New Hampshire has occurred in a variety of ways and has involved many different target audiences. Extensive efforts are made to educate the public on accurate identification and reporting of bald eagles. Articles and media news releases on the state's bald eagle recovery efforts and opportunities for direct public volunteer involvement appear frequently in print and electronic media. NHA staff offers public lectures to encourage effective public participation in bald eagle conservation. Outreach to landowners, developers, and others concerning bald eagle habitat needs are ongoing and essential.

Regulatory Protection (for explanations, see Appendix I)

- CITES - Convention on International Trade of Endangered Species of Wild Fauna and Flora
- Federal Endangered Species Act
- Bald and Golden Eagle Protection Act
- Federal Insecticide/Fungicide/Rodenticide Act
- Endangered Species Conservation Act (RSA 212-A)
- Migratory Bird Treaty Act (1918)

Quality of Habitat

The bald eagle population in New Hampshire is increasing vigorously and habitat in the state is sufficient to support a healthy, expanding population. Large lakes, reservoirs, and ice-free areas below dams will likely support additional breeding pairs over the coming decade. Bald eagles are generalist feeders; in addition to fish, they feed on aquatic mammals, waterfowl and gulls, and often carrion. Suitable nesting substrate does not appear to be a limiting factor. The greatest ongoing habitat quality concerns include the following:

- Additional shoreline development on rivers and large lakes, especially in the Merrimack River watershed and Lakes Region areas
- Increasing use of powerful motorized watercraft and growing popularity of kayaks and canoes, especially in the lakes Region and in the Androscoggin River watershed
- Growing pedestrian use in the winter months near wintering sites along the Merrimack River and in

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the Lakes Region.

- Increasing concerns about mercury and other contaminants, especially in the Merrimack River watershed and in the Great Bay/Seacoast area

Habitat Protection Status

Of 36 bald eagle nest sites known in 2014, 9 (25%) were located on public lands while the other 27 (75%) were located on private lands. Only a few of the sites on private land were subject to formal conservation easements. Few of the state's winter roost sites are on protected land.

Habitat Management Status

Nest sites on public land are managed in a manner that promotes "no activity" buffer zones around nest trees. Nest sites on private land are subject to landowner decisions, but outreach and education with landowners has usually resulted in land use practices that benefit eagles. Formal management of winter roost areas has been a great challenge because so few sites are on protected land.

Threats to this Species or Habitat in NH

Threat rankings were calculated by groups of taxonomic or habitat experts using a multistep process (details in Chapter 4). Each threat was ranked for these factors: Spatial Extent, Severity, Immediacy, Certainty, and Reversibility (ability to address the threat). These combined scores produced one overall threat score. Only threats that received a "medium" or "high" score have accompanying text in this profile. Threats that have a low spatial extent, are unlikely to occur in the next ten years, or there is uncertainty in the data will be ranked lower due to these factors.

Mortality and disturbance from lead toxicity from ingesting ammunition and tackle (Threat Rank: High)

Eagles can ingest lead in the course of scavenging fish and wildlife carcasses that contain lead tackle (e.g., sinkers) or ammunition. Lead is a potent neurotoxin that generally results in the death of the animals that ingest it, and sub-lethal levels may cause physiological impairment. In a study of 127 New England Bald Eagle recovered as either dead or injured, 14% had lead concentrations indicative of poisoning (Mierzykowski et al. 2013).

Habitat conversion due to development of shoreline (Threat Rank: Medium)

Ongoing residential and commercial development results in permanent loss of habitats for wildlife. Removal of mature trees in particular will reduce habitat suitability for Bald Eagles.

Mortality of individuals from vehicles on roadways (Threat Rank: Medium)

Eagles are occasionally attracted to road kills, where they run the risk of being hit by vehicles. In the last decade, several eagles with such injuries have been brought to rehabilitators in New Hampshire.

Mortality related to intentional or unintentional shooting and trapping (Threat Rank: Medium)

Bald eagles are attracted to bait placed in traps for other species and are occasionally caught and killed or injured. Anecdotal data in support of this threat include sightings of eagles with missing toes.

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Mortality and disturbance due to secondary poisoning from consumption of baits or poisoned target organisms (Threat Rank: Medium)

Poisoned baits (e.g., carcasses) put out for Coyotes or other “nuisance” predators can be consumed by eagles, and this usually results in mortality.

Disturbance at nests and roosts resulting from land-based recreation (Threat Rank: Medium)

Increasing bald eagle population and growing outdoor recreation industry coupled with diminishing monitoring can increase exposure to this disturbance. Repetitive defense of nest, eggs, and young may reduce food provisioning, expose young to elements and predators, displace adults from primary nest locations. Note: add a note about water-based disturbance.

Mortality and disturbance from nest predation (Threat Rank: Medium)

Raccoons are the principal predators of eagle eggs and nestlings in NH, often because they are attracted to prey remains at the base of nest trees. In addition to direct mortality, predators can injure young birds.

Disturbance from persistent organic compounds (Threat Rank: Medium)

An emerging concern is presence of increasing levels of flame-retardant bromines in raptors and their prey, as demonstrated in 114 Peregrine Falcon eggs collected at New England nest sites from 1990-2006 (Chen et al. 2008). It is still unclear whether there is any reduction in productivity associated with increased levels of organic contaminants in prey species.

List of Lower Ranking Threats:

- Mortality from oiling or ingesting oil after an oil spill
- Disturbance from mercury toxicity
- Disturbance from noise associated with recreational activity
- Disturbance to nests by watercraft
- Habitat degradation from removal of nest trees through forestry practices
- Disturbance at nest during research activities
- Disturbance from increased spring storms that impact reproduction

Actions to benefit this Species or Habitat in NH

Bald Eagle monitoring

Objective:

Continue to assess Bald Eagle recovery in New Hampshire.

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General Strategy:

Future distribution and abundance of bald eagles in New Hampshire should be monitored by conducting spring breeding surveys of known and potential breeding habitat. Active breeding territories should be checked periodically to determine occupancy status and reproductive outcome, and surveys of potential breeding territories should be conducted on a rotating basis, with annual survey intensity determined by funding and human resources available. For example, sites could be checked on a biennial or triennial rotating basis, covering 50% or 33% of potential sites annually. New Hampshire should continue to participate in the national mid-winter bald eagle survey.

Political Location:

Statewide

Watershed Location:

Statewide

Contaminants Research

Objective:

Assess levels of known and emerging contaminants in Bald Eagles.

General Strategy:

Participate in collaborative regional sampling for contaminants as a means of assessing their overall prevalence in northeastern Bald Eagles. Includes taking tissue samples (eggs, blood, feathers) and having these analyzed for contaminant loads.

Political Location:

Statewide

Watershed Location:

Statewide

Predator guards

Primary Threat Addressed: Mortality and disturbance from nest predation

Specific Threat (IUCN Threat Levels): Invasive & other problematic species, genes & diseases

Objective:

Reduce predation risk at eagle nests.

General Strategy:

Install predator guards (e.g., metal flashing) at active Bald Eagle nests.

Political Location:

Statewide

Watershed Location:

Statewide

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Eagle site management

Primary Threat Addressed: Disturbance at nests and roosts resulting from land-based recreation

Specific Threat (IUCN Threat Levels): Human intrusions & disturbance

Objective:

Minimize human disturbance at vulnerable Bald Eagle nest and roost sites.

General Strategy:

Some level of monitoring is required to identify locations where eagles are more vulnerable to human disturbance. At vulnerable sites work with landowners and law enforcement personnel to minimize disturbance through signage, outreach, trail relocation, or other means.

Political Location:

Statewide

Watershed Location:

Statewide

Reduce environmental lead availability

Primary Threat Addressed: Mortality and disturbance from lead toxicity from ingesting ammunition and tackle

Specific Threat (IUCN Threat Levels): Biological resource use

Objective:

Minimize future lead toxicosis in Bald Eagles.

General Strategy:

Support educational and action initiatives to remove lead items from use as fishing tackle and hunting ammunition. This has largely occurred with respect to fishing tackle in New Hampshire, but more work is needed on alternatives to lead ammunition.

Political Location:

National, Northeast, Statewide

Watershed Location:

Statewide

Increased shoreline protection

Primary Threat Addressed: Habitat conversion due to development of shoreline

Specific Threat (IUCN Threat Levels): Residential & commercial development

Objective:

Reduce the extent to which future shoreline development impacts Bald Eagle habitat.

General Strategy:

Strengthen zoning and land use policies that govern shoreline development, and encourage land conservation initiatives for shoreland areas.

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Political Location:

Statewide

Watershed Location:

Statewide

References, Data Sources and Authors

Data Sources

General natural history information and some sources of original research discussed in this document were obtained primarily from *The Birds of North America*, No. 506: Bald Eagle (Buehler 2000)). Unless otherwise noted, the source for New Hampshire specific data is field monitoring and management activities conducted by NHA from 1983 to 2004 under annual contracts and/or grants received from the NHFG and/or the USFWS (see Martin 2004a, Martin 2004b, and prior annual reports).

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Data Quality

Since the early 1980s, the bald eagle has been one of the most intensively monitored and managed species in New Hampshire. Breeding site data are derived from field monitoring conducted for nearly 2 decades by NHA staff and trained volunteer observers, who employed standardized monitoring techniques to determine nest occupancy and productivity, as well as locations and numbers of individuals present within the state's 5 major wintering areas (Deming 2004, Deming and Martin 2004, Martin 2004b).

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2015 Authors:

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2005 Authors:

Literature

Buehler, D.A. 2000. Bald Eagle (*Haliaeetus leucocephalus*). In *The Birds of North America*, No. 683 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, Pennsylvania, USA.

Chen, D., M. J. LaGuardia, E. Harvey, M. Amaral, K. Wohlfort, and R. C. Hale. 2008. Polybrominated diphenyl ethers in peregrine falcon (*Falco peregrinus*) eggs from the northeastern U.S. *Environmental Science and Technology* 42:7594-7600.

DeSorbo, C. R., C.S. Todd, S.E. Mierzykowski, D.C. Evers, and W. Hanson. 2009. Assessment of mercury in Maine's interior bald eagle population. Peer-reviewed unpublished USFWS. Spec. Proj. Report FY07-MEFO-3-EC. Maine Field Office. Old Town, ME. 42 pp.

Mierzykowski, S.E., C.S. Todd, M.A. Pokras and R.D. Oliveira. 2013. Lead and mercury levels in livers of bald eagles recovered in New England. USFWS. Spec. Proj. Rep. FY13 - MEFO - 2 - EC. Maine Field Office. Orono, ME. 26 pp.