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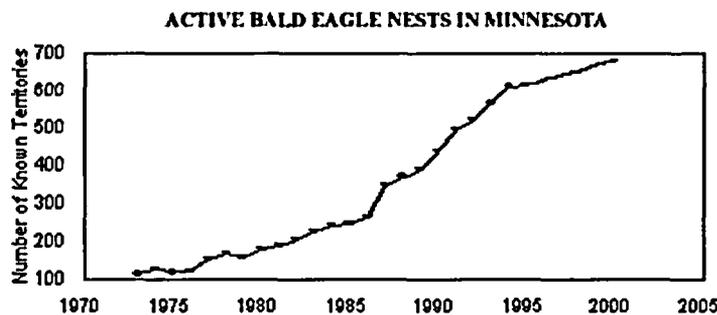
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2000 Minnesota bald eagle survey

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Introduction

The Bald Eagle (*Haliaeetus leucocephalus*), our national symbol, has long been a valued component of Minnesota's wildlife. The state's first bald eagle survey (1973), conducted while the species was in the midst of a severe population decline due to the effects of environmental contaminants, found 115 active nests. Following the bald eagle's protection as a threatened species under the federal Endangered Species Act in 1978, a federal recovery team established a goal for Minnesota of 300 active breeding territories by 2000. This goal was reached in 1987. The Minnesota Department of Natural Resources (DNR) conducted statewide bald eagle surveys annually between 1973 and 1995. These surveys indicated that Minnesota's eagle population experienced a dramatic and ongoing recovery during that period.



In 1999, the U.S. Fish and Wildlife Service proposed to remove the bald eagle from protection under the federal Endangered Species Act. In preparation for this action, the DNR's Nongame Wildlife Program conducted a statewide bald eagle survey during the 2000 nesting season. The survey was designed to visit all known nests, provide a baseline for monitoring the state's bald eagle population in the future, and clarify current habitat needs of the species.

Methods and Results

The DNR began the 2000 bald eagle survey by soliciting reports of eagle nests from natural resource professionals and the public. These reports were combined with previously known

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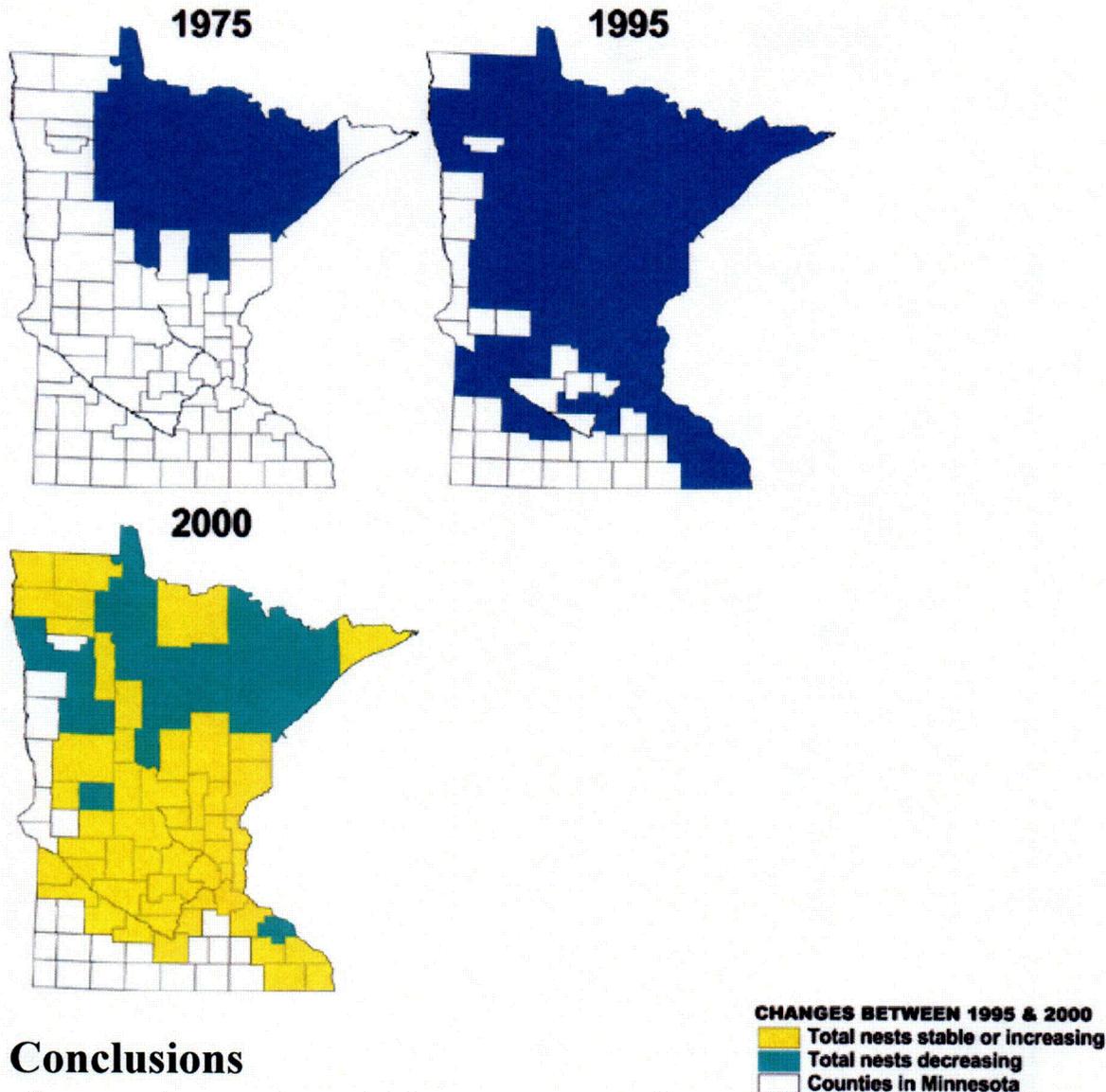
Metro area

nest locations to identify the areas to be searched during the 2000 survey. Surveys were conducted from small aircraft by Minnesota DNR, U.S. Forest Service, U.S. Fish and Wildlife Service, National Park Service, and tribal biologists. In late March and April, observers flew over known nesting areas to determine whether or not eagles were present. Over 1,300 known breeding areas were surveyed to evaluate activity, and 681 occupied breeding areas were identified. A second flight was conducted in June to count the number of nestlings in active nests. In 2000, the DNR chose to reduce costs by assessing reproduction at a portion of occupied breeding areas, representing a range of ownerships and land uses. In all, surveyors obtained counts of young at 413 nests. The number of young per nest averaged 1.22 for all nests visited during the June flights, but this figure ranged widely for different areas of the state. For example, while 8 nests within the Minnesota portion of the Upper Mississippi National Wildlife & Fish Refuge produced an average of 0.87 young per nest, refuge-wide production from 84 active nests averaged 1.28 young per nest. The percent of active nests with any young was less variable, ranging from 69.9% to 100.0%, and averaging 76.5% statewide.

SURVEY RESULTS**NESTS WITH KNOWN OUTCOMES**

	Total occupied breeding areas	Total active nests surveyed	Total young	Average young per active nest	% of nests with young
Major federal land units					
Chippewa National Forest	143	130	130	1.00	70.8%
Superior National Forest	78	73	89	1.22	69.8%
Tamarac National Wildlife Refuge	21	21	25	1.19	76.2%
Upper Miss. National Wild & Fish Refuge	15	8	7	0.87	75.0%
Voyageurs National Park	25	25	25	1.00	76.0%
Surveyed lands outside of major federal land units					
Northwest Minnesota	110	18	29	1.61	88.9%
Northeast Minnesota	56	35	49	1.40	91.4%
Central Minnesota	148	33	44	1.33	72.7%
Southwest Minnesota	30	30	46	1.53	80.0%
Southeast Minnesota	20	13	19	1.46	100.0%
Twin Cities Metro	35	27	41	1.52	85.2%
STATEWIDE TOTALS	681	410	504	1.23	76.5%

Counties with Active Bald Eagle Nests



Conclusions

The 2000 Minnesota Bald Eagle Survey documents the continuing recovery of the species within the state, and provides a baseline for population monitoring into the next millennium. Because the survey was largely limited to known nests, the results describe the minimum number of nests within the state. There are undoubtedly additional nests that have never been reported to the DNR, especially in the more remote and less visited regions of the state, and for eagles using 'atypical' habitat. The DNR will continue to record reports of bald eagle nests in preparation for future surveys.

As expected, growth of the state's bald eagle population appears to be slowing, but remains at a healthy level. As illustrated above, a comparison of 1995 and 2000 survey results indicates that bald eagles are slowly expanding into the southern and western portions of the state, where prime bald eagle habitat (large areas of forest near open water) is scarce, but critical habitat components (large trees for nesting; open water for foraging) are available. At the same time, the number of nests and reproductive success of eagles appears to be dropping in the forested region that provided a refuge for eagles in the 1970s. Due to the extraordinary efforts of Chippewa National Forest biologists over the years, data for that prime bald eagle habitat area provide a particularly complete example of this.

CHIPPEWA NATIONAL FOREST

	Total active nests	Ave. young per nest
1990	154	1.56
1994	188	1.57
2000	143	1.00

The observed decline in nest numbers and reproductive success in the forested region's prime habitat may indicate that available habitat in that region has reached its capacity to support eagles. Those eagles remaining in this densely populated region may need to expend more energy competing with other eagles, leaving less time for feeding young, and resulting in lower reproductive success. This observed decline may also be due, in part, to recent landscape-scale blow-downs of large trees in the region. This loss of nest trees may have displaced many eagles to locations that have yet to be found or are supporting less successful nests.

In cooperation with the U.S. Fish and Wildlife Service and Dr. James Grier, an eagle expert at North Dakota State University, the DNR will be using the 2000 Minnesota Bald Eagle Survey results to characterize bald eagle habitat in Minnesota, and to study the relationship of human disturbance to the reproductive success of eagles. These studies will provide information critical to the sustainable management of the state's bald eagle population.

Minnesota's bald eagle population appears large, healthy, and expanding as the new millennium begins. All indications are that more and more Minnesotans will be enjoying the awesome experience of watching an eagle soaring gracefully overhead. However, this prediction relies on the continued vigilance of every citizen in respecting bald eagles, protecting eagle habitat, and avoiding excessive disturbance to eagle nests. Only with this attention can Minnesotans insure that their children and grandchildren will have the pleasure of sharing their world with this magnificent bird.

The 2000 Minnesota Bald Eagle Survey was funded by Minnesotans who purchase Conservation License Plates for their automobiles, contributions to the Nongame Checkoff on state tax forms, and a grant from the U.S. Fish and Wildlife Service.



For more information on the 2000 Minnesota Bald Eagle Survey, where to see eagles in Minnesota, or to report sightings of nests, please contact the Minnesota Department of Natural Resources' Nongame Wildlife Program at: 888/646-6367 (toll-free) or 651/297-4966; 500 Lafayette Rd., Box 25, St. Paul, MN 55155-4025

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Environmental Review Fact Sheet Series

Endangered, Threatened, and Special Concern Species of Minnesota

Bald Eagle
(Haliaeetus leucocephalus)

Minnesota Status: Special Concern
Federal Status: Threatened

State rank¹: S3
Global Rank¹: G4

HABITAT

During the breeding season, the Bald Eagle typically inhabits forests near lakes and rivers where large trees are available for nesting. The nest trees are usually within 1 mile of water, and are often closer. In northern Minnesota, red or white pines in the supercanopy (taller than the surrounding forest) are often selected as nest trees, whereas in the central and southern part of the state, eagles choose large hardwoods such as aspen or cottonwood. In winter, Bald Eagles can be found in upland areas where game or carrion is available. However, it is most common for them to congregate along major rivers where open water remains (such as near dams or power plants), as these areas provide opportunities for obtaining their major food items, fish and waterfowl.

LIFE HISTORY

For the purpose of assessing the impacts of human activity on Bald Eagles, the nesting period can be broken into four segments, as detailed in the following table. The "wintering" season for Bald Eagles varies by latitude, but can generally be considered to be October 15th through March 15th (a period which includes spring and fall migration).

Nesting Period Segment	Dates for	
	Northern Minnesota*	Southern Minnesota*
Critical - Eagles are involved with courtship, egg-laying, and incubation.	March 15 th - May 15 th	Feb. 10 th - May 1 st
Moderately critical - Eagles are becoming physiologically conditioned for breeding (February/March), or newly hatched chicks require frequent brooding and feeding (May/June).	Feb. 15 th - March 15 th and May 15 th - June 15 th	Jan. 10 th - Feb. 10 th and May 1 st - June 1 st
Less critical - Eagle chicks are one month old to 1 week post-fledging.	June 15 th - Aug. 15 th	June 1 st - July 31 st
Non-critical - Most eagles are not regularly present at the nest site.	Aug. 15 th - Feb. 15 th	July 31 st - Jan. 10 th

*The state is arbitrarily divided into north and south by State Highway 210.

IMPACTS / THREATS / CAUSES OF DECLINE

- habitat loss
- human disturbance
- farm runoff and industrial pollution
- leg-hold traps
- management activities such as timber harvest and burning
- power lines and transmission structures (collisions, electrocutions)
- roads and bridges (vehicle collisions)
- lead poisoning (e.g. by lead shot ingested by eagles during feeding)
- shooting (in violation of state and federal law)
- contaminants and poisons (particularly organochlorine, organophosphorus, mercury and other heavy metals)

PROTECTION

Bald Eagles are protected under the Migratory Bird Treaty Act, and under the Bald and Golden Eagle Protection Act of 1940 and the Endangered Species Act of 1973, as amended, which prohibit the possession or taking of Bald Eagles, or their nests, eggs, or young. "Taking" is defined by the Endangered Species Act as to harass (i.e., create the likelihood of injury), harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Prohibited activities include, for example, cutting down nest trees (at any time of the year), and intense human activity that is demonstrated to have caused adult eagles to abandon eggs or young in the nest. Possession permits may be issued by the U.S. Fish & Wildlife Service for Indian religious purposes, or for scientific or exhibition purposes of public museums, public scientific societies, or public zoological parks.

In addition, the National and Minnesota Environmental Protection Acts prevent certain actions which would cause significant adverse impacts to the environment (including destruction of habitat for listed species) if there is a reasonable alternative to the proposed action.

If you are uncertain whether a proposed action may take Bald Eagles or their nests, or if you for any reason cannot follow the recommendations below, contact USFWS Ecological Services at (612) 725-3548.

RECOMMENDATIONS FOR AVOIDING AND MINIMIZING IMPACTS

These recommendations will be useful in avoiding or minimizing effects that may be caused by federal or non-federal actions, but all federal actions that may affect bald eagles must also complete consultation with U.S. Fish and Wildlife Service under section 7 of the Endangered Species Act. A federal action is any action that a federal agency funds, authorizes, or carries out. Contact the U.S. Fish and Wildlife Service at (612) 725-3548 for further information regarding section 7 consultation.

WINTERING AREAS²

Bald Eagle wintering area habitat contains three main components: foraging (feeding) areas, daytime perching areas, and night roosts. Within these areas, eagles need to be protected from human disturbance, physical alterations of their habitat, environmental contaminants, and loss of food resources.

Foraging and Daytime Perching Areas: In Minnesota, winter foraging areas where Bald Eagles congregate are located primarily along major rivers. Daytime perches tend to be near these foraging areas. While eagles are present, buffer zones (areas within which there is no human activity) of at least 1/4 mile (400m) should be maintained around foraging areas where possible. Where this is impractical, human use should be avoided between sunrise and 10am, when Bald Eagle feeding activity is greatest. Buffer zones around daytime perches should be 1/8 to 1/4 mile (250m-400m). At foraging areas along rivers, trees within 100 ft. of the shore seem to be preferred as perches. Therefore, no trees greater than 12 in. diameter should be removed within 100 ft. (33m) of river banks or other foraging areas. Activities which have the potential to kill trees (such as livestock grazing and dumping of dredge spoil) should be avoided within foraging and perching areas. New road and bridge construction should be at least 2 mile from major foraging areas.

Night Roosts: Bald Eagles are more sensitive to disturbance at night roosts than at foraging and daytime perching areas. No logging, development, or road building should occur at any time in critical roosts. Critical roosts are defined as those used more than 14 nights per season by eagles from local breeding territories *or* more than 14 nights per season by more than 15 eagles *or* roosts which have been documented as active for 5 years or longer. A buffer zone of at least 1/4 mile (400m) should be maintained around night roosts, within which both low and high impact activities, including recreation, are restricted while the roost is in use. New road or bridge construction should be at least 1/5 mile from critical roosts.

RECOMMENDATIONS FOR AVOIDING AND MINIMIZING IMPACTS Cont.

NESTING AREAS

Studies show that Bald Eagles are vulnerable to human intrusion. The vulnerability varies with the type of disturbance and the particular eagle, as some individuals have become accustomed to human activity near their nests. However, because some eagles are easily disturbed, human contact with Bald Eagles should be avoided whenever possible, particularly during the critical segment of the nesting period. The following table, adapted from the Minnesota Department of Natural Resources (DNR) Management Guidelines for Bald Eagle Breeding Areas, and the Northern States Bald Eagle Recovery Plan, summarizes recommendations for protecting individual occupied and active nest sites.

If a nest is not occupied during the year in which the activity will occur, the recommendations for the Non-critical Nesting Period Segment may be used year-round. If a nest is abandoned (unused for more than 5 years and not being maintained by eagles), activities are only restricted within the Primary Zone. Whether a nest is occupied, unoccupied, or abandoned must be determined in consultation with a DNR Nongame Specialist (see contact numbers below the table) and the U.S. Fish and Wildlife Service (612-725-3548). Because eagles often rebuild nests that have been blown out of trees, in this situation activities are restricted within the Primary Zone for 3 years after the event. If the nest is not rebuilt, zone restrictions are removed.

Activity	Nesting Period Segment			
	Critical	Moderately	Less Critical	Non-critical
Primary Zone: (within 330 feet of the nest)				
Landscape Alteration ^a	avoid	avoid	avoid	avoid ^b
Construction (structures, trails, etc.) ^c	avoid	avoid	avoid	avoid ^b
Burning ^d	avoid	avoid	avoid	restrict/minimize ^b
Minor Forest Maintenance ^e	avoid	avoid	avoid	restrict/minimize ^b
Motorized Access	avoid ^f	avoid ^f	restrict/minimize ^b	restrict/minimize ^b
Human Entry	avoid ^f	avoid ^f	restrict/minimize ^b	restrict/minimize ^b
Low Flying Aircraft	avoid	avoid	no restrictions	no restrictions
Secondary Zone: (330 to 660 feet from the nest)				
Landscape Alteration ^a	avoid	avoid	avoid	restrict/minimize ^b
Construction (structures, trails, etc.)	avoid	avoid	restrict/minimize ^b	restrict/minimize ^b
Burning ^d	avoid	avoid	avoid	restrict/minimize ^b
Minor Forest Maintenance	avoid	avoid	no restrictions ^f	no restrictions ^g
Motorized Access	avoid ^f	restrict/minimize ^b	restrict/minimize ^b	no restrictions ^g
Human Entry	avoid ^f	restrict/minimize ^b	restrict/minimize ^b	no restrictions
Low Flying Aircraft	avoid	restrict/minimize ^b	no restrictions	no restrictions
Tertiary Zone: (660 feet to 1/4 mile from the nest - May extend up to 2 mile from the nest, if topography or vegetation permit a direct line of sight to the disturbance area.)				
Landscape Alteration ^a	avoid	avoid	avoid	no restrictions ^g
Burning ^d	avoid	avoid	avoid	restrict/minimize ^b
Other Activities (as listed above)	avoid ^f	no restrictions ^g	no restrictions ^g	no restrictions ^g

^a Landscape alteration includes activities such as clear cutting or land clearing, which result in significant changes in the landscape.

^b Restrictions should be decided on a case by case basis, based on type, extent, and duration of proposed activity, and sensitivity of individual eagle pairs. For assistance, contact your nearest DNR Nongame Specialist: Bemidji (218-755-2976); Grand Rapids (218-327-4267); Brainerd (218-828-2228); New Ulm (507-359-6033); Rochester (507-280-5070); St. Paul (651-297-2277).

^c For construction involving land clearing, see also recommendations for the "Landscape Alteration" activity.

^d If burning can not be done within the non-critical nesting period segment, please contact your nearest DNR Nongame Specialist (see contact numbers above).

^e Such as thinning of tree stands, pruning, and other like maintenance.

^f Some eagles have become habituated to human activity and can be tolerant of these activities, particularly if they were occurring regularly at the time the eagles began nesting. In these cases, complete avoidance of the activity may not be necessary. If you believe this is the case in your particular situation, contact your nearest Nongame Specialist (see contact numbers above).

^g However, the habitat should not be altered in ways that would make it unsuitable for future nesting.

REFERENCES

- ¹Association for Biodiversity Information. "Heritage Status: Global, National, and Subnational Conservation Status Ranks." NatureServe. Version 1.3 (9 April 2001). <http://www.natureserve.org/ranking.htm> (15 April 2001).
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- ²Martell, M. 1992. Bald Eagle Winter Management Guidelines. Unpublished brochure, The Raptor Center, University of Minnesota, St. Paul, unpagged. August.