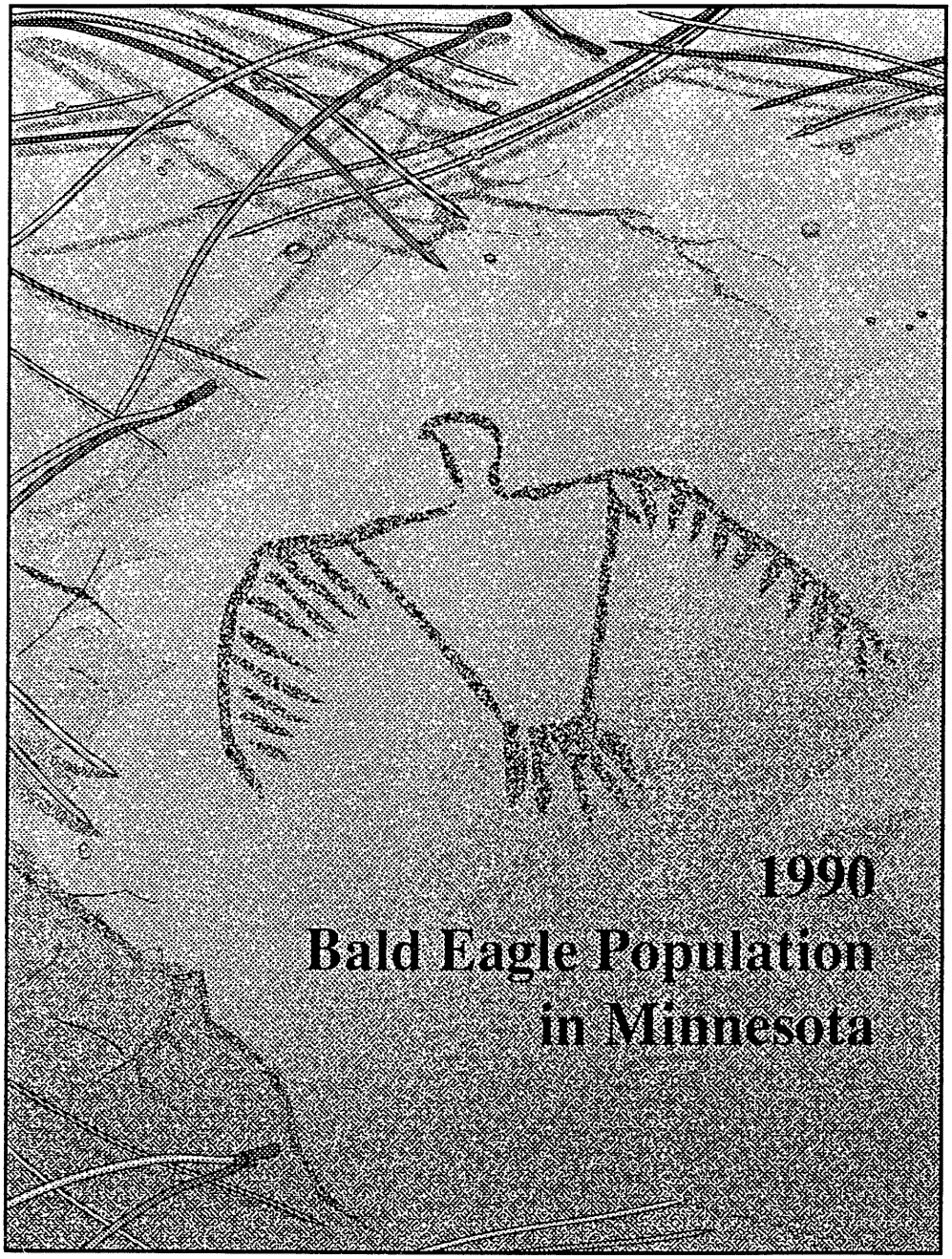

1990 Bald Eagle Population in Minnesota

by
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INNESOTA DEPARTMENT OF NATURAL RESOURCES – BIOLOGICAL REPORT NO. 38

Abstract

Minnesota has been monitoring bald eagles statewide since 1973. In 1990, the Department of Natural Resources' Nongame Wildlife Program and three federal agencies documented a population high of 437 occupied breeding areas that produced 467 young. This exceeds the federal goal of 300 breeding areas by the year 2000.

Minnesota currently has the largest breeding population of bald eagles in the lower 48 United States. In addition to conducting population surveys, 1990 protection strategies included data management, two winter studies, development of a bald eagle management plan, ongoing preparation of individual habitat management plans, contaminant monitoring, rehabilitation efforts and translocation.

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Population Monitoring

A. Breeding Season

Survey results: The bald eagle population in Minnesota achieved a record high in 1990. From 115 known occupied breeding areas[1] in 1973, the year statewide surveys were initiated, the population has increased dramatically to 437 areas (Table 1). Four survey areas within the state were monitored by federal and state agencies, including the U.S. Forest Service, the National Park Service, the U.S. Fish &Wildlife Service and the Minnesota Department of Natural Resources' Nongame Wildlife Program (Table 2).

Table 1. Minnesota Bald Eagle Nesting Data, 1973-1990

	Breeding Areas			Young		
Year	Occupied[a]	Number Successful	% Successful	Total	Per Occupied Breeding Area	Average Brood Size
1973	115	71	62	113	.98	1.59
1974	127	77	61	96	0.76	1.25
1975	120	87	73	145	1.21	1.67
1976	122	93	76	163	1.34	1.75
1977	156	114	73	179	1.15	1.57
1978	168	115	68	188	1.12	1.63
1979	159	111	70	196	1.23	1.77
1980	181	133	73	239	1.32	1.80
1981	190	132	69	242	1.27	1.83
1982	207	145	70	245	1.18	1.69
1983	229	170	74	321	1.40	1.89
1984	245	165	67	274	1.12	1.66
1985	250	161[b]	71[b]	275[b]	1.21[b]	1.71[b]
1986	266	187[c]	72[c]	312[c]	1.21[c]	1.67[c]
1987	350	227	65	360	1.03	1.59
1988	372	250	67	412	1.11	1.65
1989	390	261	67	430	1.10	1.65
1990	437	300	69	467	1.07	1.56

[a] Number of occupied breeding areas regardless of outcome.

[b] These figures do not include data from 23 occupied nesting areas of unknown outcome in the Boundary Waters Canoe Area.

[c] These figures do not include data from 9 occupied nesting areas of unknown outcome in the Boundary Waters Canoe Area.

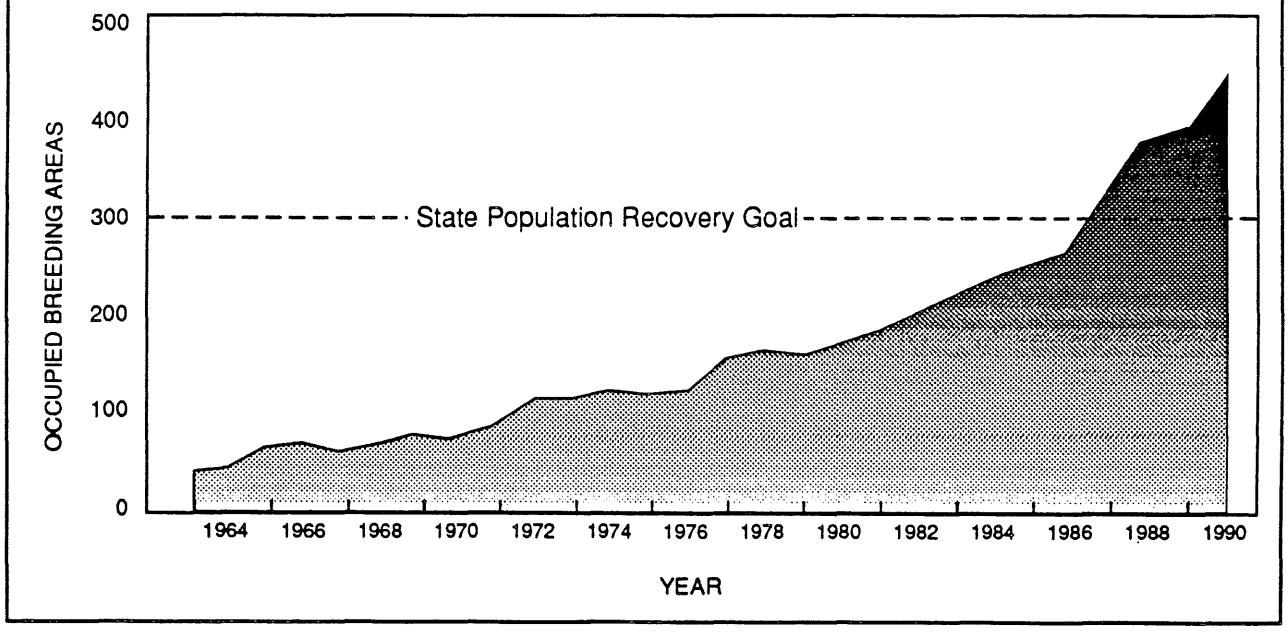
[1] Areas where evidence of breeding is observed: a) young observed, b) eggs or eggshell fragments observed, c) one adult in incubation posture, d) 2 adults at nest or within breeding area, e) 1 adult and 1 immature at or near a nest and f) an empty nest which shows clear evidence of having been repaired in the current season.

Table 2. Minnesota Bald Eagle Nesting Activity in Four Survey Areas, 1990

Survey Area	Occupied Breeding Areas	Successful Breeding Areas	Percent Successful	Number of Young	Young per Occupied Breeding Area	Average Brood Size
Chippewa NF	154	102	66	160	1.03	1.56
Superior NF	74	57	77	85	1.15	1.49
Voyageurs NP	28	17	61	23	.82	1.35
"Other Areas"	181	124	68	199	1.10	1.60
Statewide	437	300	69	467	1.07	1.56

Aerial surveys were conducted in the first half of April to determine nest occupancy and in late June or early July to count young near fledging. The results show that the population has surpassed, for the fourth consecutive year, the Minnesota recovery goal set by the Northern States Bald Eagle Recovery Plan (300 occupied breeding areas by the year 2000). This represents an increase of 12% over the 1989 breeding population and continues the significant growth observed since 1980 (Figure 1). Of the 437 occupied areas, 69% (300) were successful, producing a total of 467 young (Table 1). The number of young produced per occupied area was 1.07 and the average brood size was 1.56. The Northern States Recovery Plan establishes a goal of at least 1 young per occupied breeding area as a recovery objective.

Figure 1. Estimated Number of Occupied Breeding Areas for Bald Eagles in Minnesota 1963-1990



In conjunction with the population increase, bald eagles have expanded their breeding range from the north central and northeastern regions of the state to habitats where they have not nested for 100 years or more. Breeding pairs are now established in east-central Minnesota, along the Mississippi River between St. Paul and the Iowa border, in the Twin Cities metropolitan area and in several western counties (Figure 2). Some pairs are now choosing nesting sites near developed areas and adjacent to lakes with moderate recreational use.

Data Management: Data collected from the annual aerial surveys is stored in the Natural Heritage Information System maintained by the Natural Heritage and Nongame Wildlife Programs. Locations of eagle nests are plotted on 7.5 min. quads and included with other information about the nests in a computerized database. An historical database has recently been developed that will also track the breeding activity of each nest each year and will contain additional data (e.g., nest tree characteristics, distances to water and development, etc.) on each nest site. To date, these data have been maintained in manual files and on computers in DNR regional offices. The new database will improve our ability to monitor breeding area productivity as well as individual nest activity.

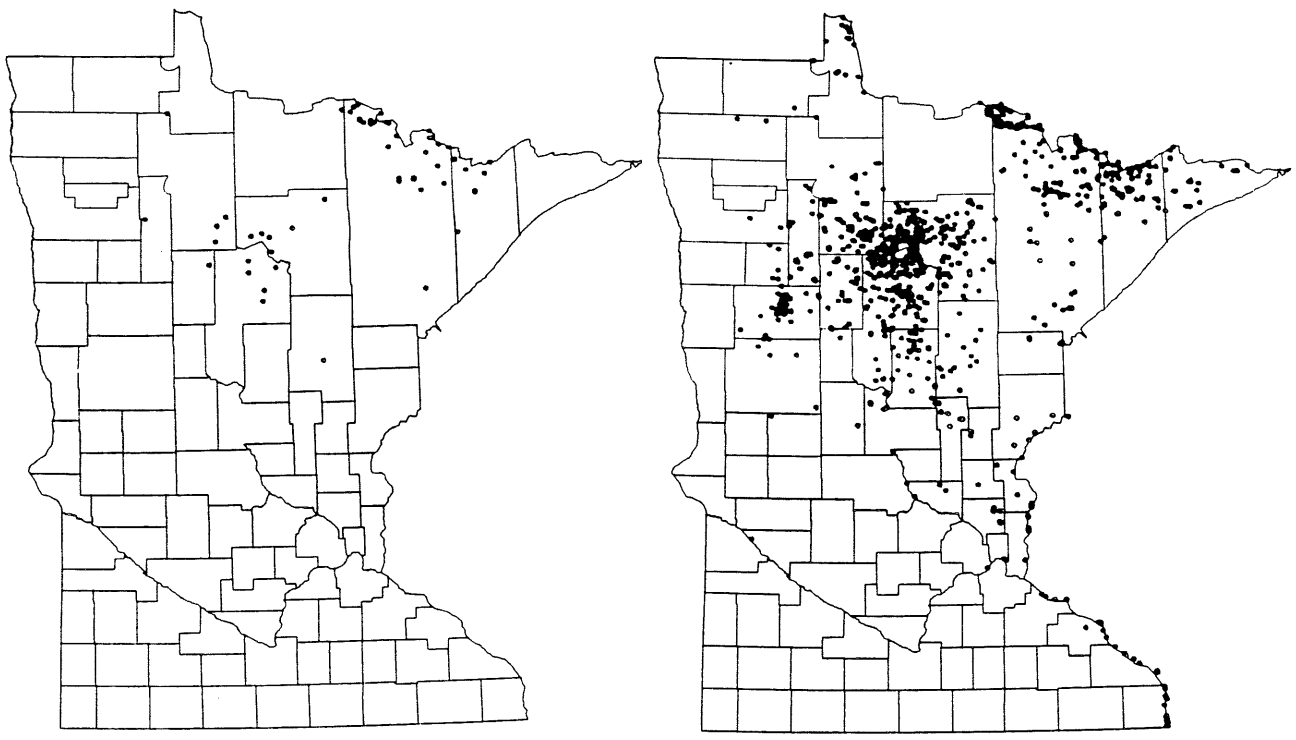
B. Winter Studies

Winter poses special problems for eagles that remain in Minnesota during the cold months. Two ongoing monitoring projects gather data on the population size and habitat requirements of Minnesota's winter eagle population.

Minnesota has participated in the National Wildlife Federation's Mid-Winter Bald Eagle Survey since 1979. In 1987, a standardized survey route was established which includes the Minnesota River from Ortonville to Fort Snelling and the Mississippi River from Minneapolis to Wabasha, the areas in Minnesota most likely to sustain wintering eagles. The route was surveyed in January 1990 by John Schladweiler, Lonnie Hebl and Mary Miller of the Nongame Wildlife Program and Mark Martell of The Raptor Center. Sixty-five eagles were observed, with the greatest concentrations (44) occurring along the Mississippi River between Red Wing and Wabasha (Table 3).

The second project, to identify winter roost and feeding areas utilized by eagles along the Mississippi and St. Croix Rivers, is being conducted by Joan Galli of the Nongame Wildlife Program.

Figure 2. Bald Eagle Records in the Heritage Database



Pre 1976 **As of January 1991**

Aerial surveys to locate eagle concentrations have been conducted for 3 years and will be continued for 1 additional winter in 1990/1991. When areas have been identified, they will be included in the Natural Heritage Information System Database and protection strategies will be explored.

C. Federal Status Assessment

The successful recovery of bald eagle populations in 4 of the 5 federal recovery regions in the lower forty-eight states has led the U.S. Fish and Wildlife Service to review the bird's status in preparation of a proposal to either reclassify or delist the species. Originally, the bald eagle was listed as endangered in the lower 48 states under the 1966 Endangered Species Preservation Act. However, when the Endangered Species Act was passed into law in 1973, the Service reclassified the species as threatened in Minnesota, Wisconsin, Washington, Oregon and Michigan where higher population numbers did not meet the criteria for endangered status. A notice of review published in the Federal Register in February

Table 3. The National Wildlife Federation's Midwinter Bald Eagle Survey

	Route #1 Minnesota River Ortonville-Fort Snelling			Route #2 Minnesota & Mississippi Rivers Black Dog Lake-Hastings			Route #3 Mississippi River Red Wing-Wabasha			Total		Total Eagles
	Adults	Imm.	Total	Adults	Imm.	Total	Adults	Imm.	Total	Adults	Imm.	
1987	14	11	25	1	0	1	18	8	28	33	19	54
1988	16	4	20	11	2	13	20	3	23	47	9	56
1989	23	11	34	6	3	9	33	24	57	62	38	100
1990	12	1	13	6	1	7	42	2	44	60	4	64

1990 states that the Service "is requesting information on... impacts that would result from a proposal to either reclassify, downlist, or delist all or specific populations of the bald eagle."

Minnesota's eagle population is the largest in the conterminous States; however, it is unlikely that delisting will occur. A news release from the Department of the Interior issued on the same day as the notice of review quotes Service Director John Turner as saying "...It is possible a reclassification to threatened (i.e., throughout the species range) may reflect more accurately the species' actual biological status. I want to emphasize the Service is not considering removing the bald eagle from the protection of the Endangered Species Act. A reclassification to threatened, should we decide that is warranted, would continue to offer the full protection of the Endangered Species Act." An additional statement in the news release further appears to negate the delisting possibility. "No consideration is being given to completely removing any bald eagle population from the Endangered Species List."

The Minnesota Department of Natural Resources submitted comments to the Endangered Species Coordinator of the USFWS in March of 1990. The Department agreed with the proposed downlisting of the bald eagle to Threatened due to recovery of the species throughout much of its range, and supported retaining the species as federally threatened in Minnesota. A decision on reclassification is expected sometime in 1991.

In the event that Minnesota's federally threatened bald eagle population is delisted, population monitoring will continue. Section 4 of the Endangered Species Act directs the Secretary of the U.S. Fish and Wildlife Service to implement a system to monitor recovered species for not less than 5 years. When monitoring shows that protection is needed to prevent a significant risk to a species, the Service is to utilize the Act's existing emergency listing authority.

Bald Eagle Management Plan

Eagle management has been carried out in Minnesota for nearly 10 years, according to the guidelines in the North Central States Bald Eagle Recovery Plan. In 1990 personnel of the Nongame Wildlife Program (NWP) completed a draft of the *Minnesota Department of Natural Resources Bald Eagle Management Plan*. This document will provide specific guidance on managing the species in Minnesota for NWP staff and other Department of Natural Resources (DNR) divisions, especially those with land management responsibilities.

The eagle management plan includes discussions of historical distribution, biology, management history and management actions. Management actions address monitoring and protection of eagles and their habitat. These include continuation of the annual eagle counts, preparation of habitat management plans for each nesting territory, and coordination with other public and private landowners. Maintaining the only statewide database on eagle distribution and nesting activity is noted as being essential for each of these activities. Minnesota's involvement in providing eaglets for translocation and rehabilitation of injured birds is also discussed in the plan, as are ideas for additional research projects.

Habitat Management Plans

The North Central States Bald Eagle Management Recovery Plan calls for the preparation of management plans specific to each nesting territory. One hundred and six habitat management plans for bald eagle breeding territories have been completed since 1984 by Nongame Wildlife personnel (Table 4). Eleven plans were completed in 1990. Each plan characterizes the general breeding area and nest site and describes the behavior and nesting history of the resident pair. Management constraints that are necessary to ensure full protection of the nest site are also specified. To date the emphasis in preparing nest management plans has been on private lands (Figure 3). Although many plans have also been prepared for nests in public ownership, these efforts will be scaled back beginning in 1991 because of the species significant population growth. An abbreviated field review sheet will replace the more detailed nest management plan for these sites.

Table 4. Number of Nest Management Plans Completed 1984 - 1990 by Region

	REGION 1	REGION 2	REGION 3	REGION 5	REGION 6	TOTAL
1984		2	5			7
1985	1	10	4			15
1986	10	8	7			25
1987	11		1	1		13
1988	16	5	5			26
1989	3	2	3		1	9
1990			9		2	11
Total	41	27	34[a]	1[b]	3	106

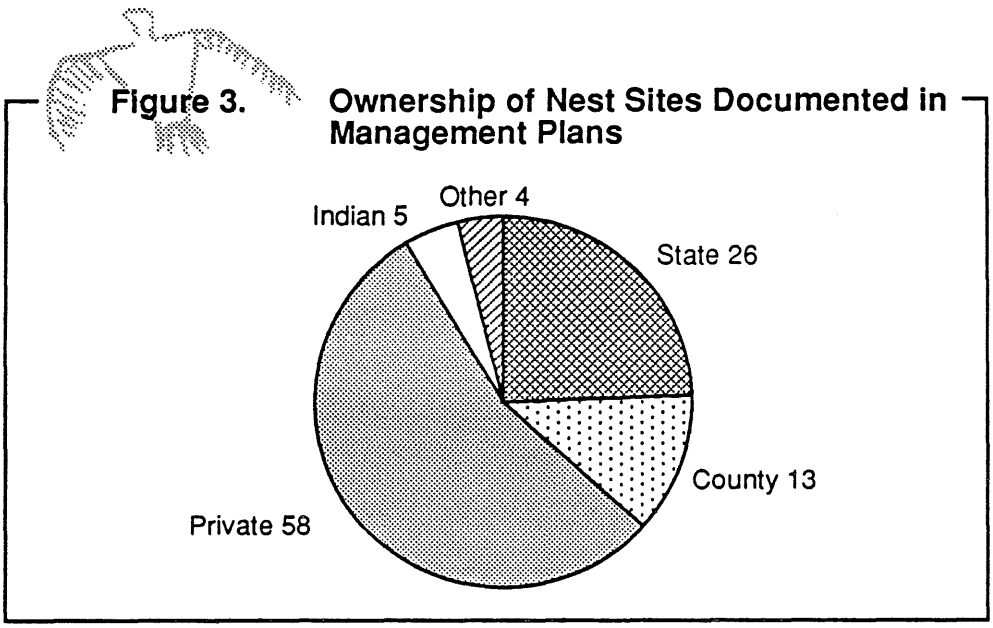
[a] Includes 7 Aitkin county plans completed before transfer of Aitkin from region 2 to region 3.
[b] Nongame Specialist position created in 1988.

Contaminant Monitoring

Legislation restricting the use of organochlorines in the early 1970s is one of the primary factors responsible for current bald eagle population increases. Despite this success, there is growing concern that contaminants, including heavy metals, PCB's, DDE and dieldrin continue to pose problems. Several studies in the Great Lakes region have reported that eagles nesting along the shoreline have lower reproductive success than those nesting further inland. Contaminant levels from addled eggs collected close to the shoreline are also higher than levels in eggs collected inland.

In 1987 Bill Bowerman, Michigan State University, initiated a more intensive study in Michigan to explore these findings. Prior to 1987 contaminant levels had only been measured in addled eggs. This study measured organochlorine and PCB levels in blood sera from nestling eagles. This non-destructive methodology permitted a more intensive and systematic sampling design.

In 1989 Bowerman's work was expanded to other states in the Great Lakes Region including Minnesota. The emphasis in Minnesota is on birds from three areas: Voyageur's National Park, where there were known contaminant problems in fish; at Trout Lake in Itasca County, where high contaminant levels had also been documented; and along the Mississippi River, where it was suspected that an expanding population of bald eagles was being subjected to a variety of contaminants.



With assistance from Voyageur's National Park (VNP), the Chippewa National Forest, the Minnesota Pollution Control Agency (MPCA), the Raptor Center and the Nongame WildlifeProgram, blood samples were collected from 2 eaglets at Trout Lake, 8 in VNP, 3 from the Mississippi River (one in Minnesota and two in Wisconsin), and 4 from young that were collected for translocation projects in east-central Minnesota. Breast feathers were also collected from VNP and Trout Lake birds for mercury analysis. Results of the blood contaminant analyses are not yet available. Mercury analysis of the breast feathers, however, showed high levels (>11 mg/kg) in 6 of 10 birds sampled (Larsen, MPCA, personal communication).

In 1990, with funds provided by the Wisconsin DNR (WDNR), the Raptor Center, and MNDNR, Bowerman and the USFWS collaborated to increase sampling of birds along the Mississippi River. A total of 13 blood and feather samples and 4 addled eggs were collected for analysis from 10 nests (6 in Minnesota, 1 in Iowa, and 3 in Wisconsin). These results will be compared to a control sample from 14 eaglets in Wisconsin collected for translocation to Tennessee and Arkansas.

Rehabilitation

In 1990, The Raptor Center at the University of Minnesota accepted nineteen bald eagles from Minnesota. Of that number, twelve were sent to the Center by the regional Nongame Wildlife Specialists: five from region 1, six from region 2 and one from region 3. The birds' problems included

shooting, starvation, trapping, wing problems and nest blowdown. Five of the birds were released, including one young bird that was sent to Georgia for hacking (fledging young from an artificial nest structure, usually a box set on a tall platform or building). A fifth bird which was hacked in Oklahoma last year is ready for release. Three of the birds are still being held at the Center and two were euthanized. Another bird, which suffered a broken wing, is being housed in Nashville, Tennessee for educational purposes (Table 5). That 42% of the birds sent in by the nongame regional specialists have been fully rehabilitated (with 3 more probable releases in the future) indicates the importance of rehabilitation efforts for federally listed species.

Translocation

To help restore eagle populations to other areas of the country, the Department of Natural Resources each year takes four eagle chicks in northern Minnesota for transport and release in other states. The three northern DNR regions are selected on a rotational basis. Only one young is taken from a nest containing two or more eaglets, leaving at least one eaglet for the parents to raise. Over the years, New York, Pennsylvania, Tennessee, Missouri, Arkansas and Georgia have been recipients of Minnesota chicks. Three of the young taken in 1990 came from region 1 in northwestern Minnnesota, two from Hubbard county nests and one from a Beltrami county nest. The fourth bird was from St. Louis county (in Region 2). It survived a nest blowdown and was sent to The Raptor Center prior to translocation. All four birds were sent to Georgia for release. In 1991, four young will be selected from region 3 in central Minnesota for translocation, once again, to Georgia.

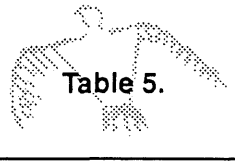


Table 5. Bald Eagles Sent to the Raptor Rehabilitation Center by Regional Nongame Wildlife Specialists in 1990

	Region 1		Region 2		Region 3	
	Admission	Outcome	Admission	Outcome	Admission	Outcome
Eagle 1	Shooting	Still at RRC	Tip of wing missing	Released	Couldn't fly	Euthanized
2	Injured	Still at RRC	Nest blowdown	Hacked in Georgia		
3	Starvation (bird had been hacked in Oklahoma)	Ready for release	Broken wing	Housed in Nashville, Tenn. for educational purposes		
4	Broken wing	Euthanized	Waterlogged	Released		
5	Found in duck pen	Released	Caught in trap	Still at RRC		
6	Couldn't fly	Released				

Funding

In 1990, the Nongame Wildlife Program spent $38,605 on bald eagle management. This included survey work, habitat management plan development and protection strategies, and database maintenance (Figure 4). The greater expenditure in Region 6, which includes the metro area, reflects the aerial surveys to determine critical winter feeding and roosting areas. The central office staff compiled survey results and updated the Natural Heritage Database.

Public Education

Several publications about bald eagles are available through the Nongame Wildlife Program. The bird's biology and history are subjects of short papers and pamphlets which can be sent to requesters. The newest publication, *Bald Eagles in Minnesota*, gives a short history of the species nation-wide and in Minnesota, highlights the people and agencies most responsible for the recovery effort, delineates the contributions made by the Nongame Wildlife Program and gives a brief description of the bird's breeding biology. Perhaps of most interest to the public is the information, complete with maps, of where eagles

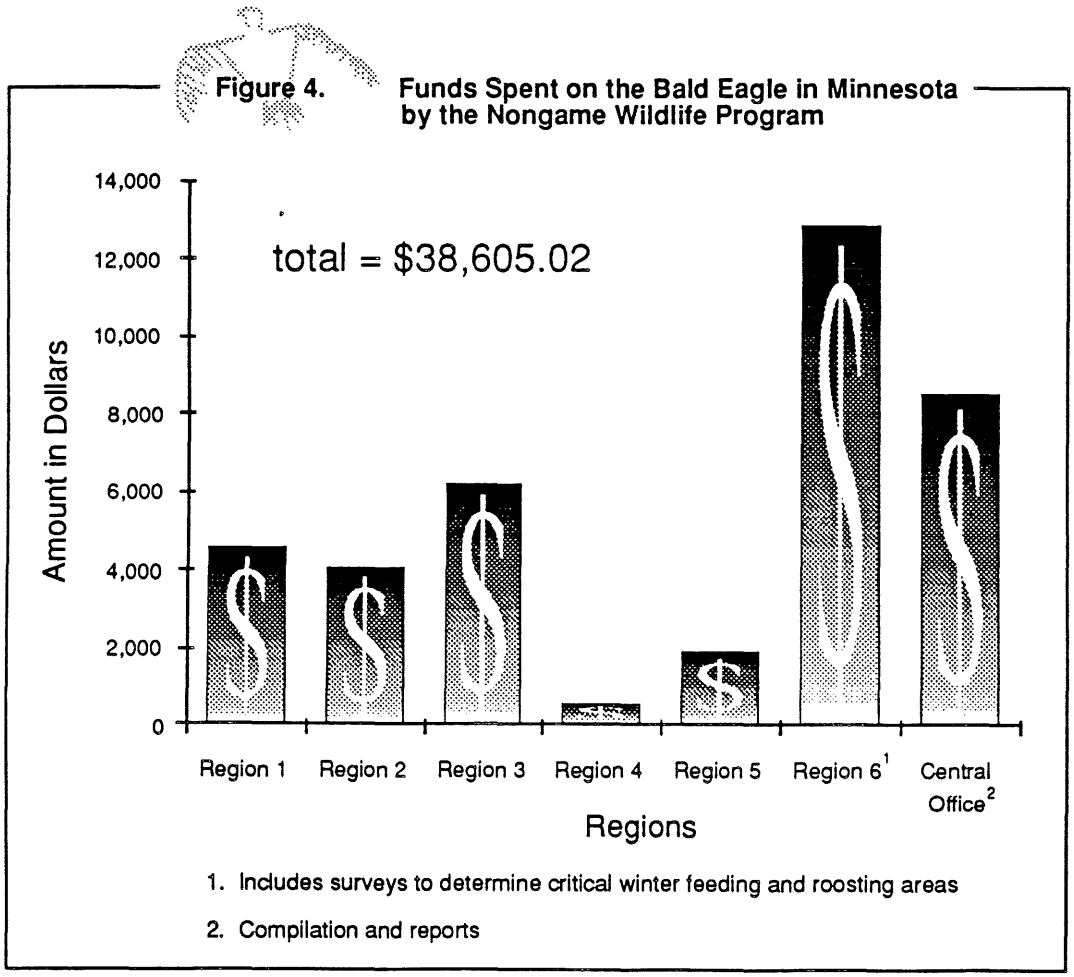


Figure 4. Funds Spent on the Bald Eagle in Minnesota by the Nongame Wildlife Program

1. Includes surveys to determine critical winter feeding and roosting areas
2. Compilation and reports

can be observed during both summer and winter. This and other publications on bald eagles can be obtained by writing to:

DNR Nongame Wildlife Program
Box 7, 500 Lafayette Rd.
St. Paul, MN 55155-4007

Several films are also available to the public through the DNR's Film Library . *Last Stronghold of the Eagle* (#165), is a 16mm film about a gathering of bald eagles in the Chilkat Valley of Alaska. It is a splendid 25 minute documentary about bald eagle biology. *We Care about Eagles* (#505), is available in either filmstrip and cassette (includes teacher's guide) or slides and cassette. This 15 1/2 minute filmstrip includes over 70 color pictures of eagles soaring and shots of young in their treetop nest. *Nongame Wildlife Program* (#148), and *Wildlife on Reprieve* (#156), contain segments on the bald eagle. Films can be ordered from:

Department of Natural Resources
Information and Education Film Library
500 Lafayette Road
St. Paul, MN 55155-4046
(612) 296-0899

Acknowledgments

Personnel stationed at the National Forests and National Park coordinated population surveys within their respective boundaries (John Mathison, Chippewa National Forest; Ed Lindquist, Superior National Forest; and Lee Grim, Voyageurs National Park), while other areas of Minnesota were surveyed by Dr. Dan Frenzel, National Park Service personnel on the Lower St. Croix National Scenic Riverway, U.S. Fish and Wildlife personnel from Tamarac NWR and the Upper Mississippi River Fish and Wildlife Refuge, Joan Galli (DNR) from St. Paul, Bruce Lenning (DNR) from Bemidji, Doug Keran (Brainerd VoTech), Kevin Woizeschke (DNR), Dick Stoltman (DNR) and Pam Perry (DNR) from Brainerd, Jeff Hines (DNR) from Grand Rapids and Bob Bohm (Minnesota Power) from Duluth. The DNR Nongame Wildlife Program assumed responsibility for coordinating the results of the surveys. Tom Klein prepared the cover, text, tables and figures. Bonita Eliason provided helpful comments on the draft report.

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