

BALD EAGLE WINTER ROOSTS
ON THE MISSISSIPPI AND WISCONSIN RIVERS.

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INTRODUCTION

During the winter Bald Eagles (Haliaeetus leucocephalus) congregate near open water by day searching for food which includes fish, waterfowl, and carrion (Stalmaster 1987). Eagles have also been reported feeding at inland sites, usually where there is a livestock farming operation (Harper et al. 1988). During the evening they congregate at communal roosts which are often used every night. These roosts are thought to provide protection from winds, precipitation, and cold temperatures. The importance of both the winter feeding areas and evening roosts to Bald Eagle populations has been recognized for many years and was considered critical in their recovery by the Northern States Bald Eagle Recovery Team (U.S.D.I. 1987).

Bald Eagles use both the Mississippi and Wisconsin rivers and their tributaries for foraging, rest sites, and evening roosts. Bald Eagle use of the rivers is threatened however from habitat loss due to residential and commercial development, increased recreational activities, and contamination of the eagles prey.

Specific locations of Bald Eagle roost and feeding sites along the Wisconsin portions of the Mississippi and Wisconsin rivers has been poorly documented, and little is known about the numbers of birds, their ages, or seasonal movements. We report here on a project to document eagle use of these rivers which was coordinated by Mark Martell of The Raptor Center at the University of Minnesota and Charlene Gieck from the Wisconsin

Dept. of Nat. Resources and includes data from three separate projects attempting to document roosting Bald Eagle numbers in Wisconsin: the Bald Eagle Action Committee, coordinated by Dave Erickson, working on the Wisconsin River in the Sauk City/Prairie du Sac Area; Eagle Valley Nature Preserve coordinated by Brett Mandernack, working at Glen Haven, Wis.; and The Raptor Center at the University of Minnesota, working on the Mississippi River, coordinated by Mark Martell, Jill Nibe, and Patrick Redig.

During the winter of 1990-1991 we attempted to locate and document roosting sites of Bald Eagles wintering along portions of the Mississippi and Wisconsin rivers. This was done through a literature search for known roosting and feeding sites, and ground searches to locate Bald Eagle roosting areas. We also documented the numbers and ages of eagles using these areas, and attempted to identify factors such as weather and human use patterns which might affect eagle use and impact the management of the area.

METHODS AND MATERIALS

Thirty-five volunteers were enlisted to help with literature searches as well as the field work portions of the project. A list of the volunteers appears in the acknowledgements. To locate data on historic roosts and potential roost and feeding sites, literature searches were conducted at the libraries of the University of Minnesota and the University of Wisconsin. We also

consulted wildlife managers, biologists, and others familiar with the Mississippi and Wisconsin Rivers. Known and potential winter use areas were mapped (Fig. 1). Roost counts and searches for feeding and roosting sites were done by the authors as well as volunteers under their direction.

During the winter of 1990-91 our ground searches included the Mississippi River from river mile (rm) 806 near Prescott Wis., to rm 786 near Wacouta Bay, Minn.; and from Trempeleau, Wis. (rm 714) to Guttenberg, Iowa (rm 615). The Wisconsin River portion extended from the Prairie du Sac dam, downriver about 27 km (17 mi.) almost to Spring Green, Wis. A total of six roosts were observed along the Mississippi River; Big River Coulee (BRC), North Lake Area (NLA), Genoa, Wis. (GEN), Lansing, Iowa (LAN), and Eagle Valley, Wis. (EGV). Six roosts were observed along the Wisconsin River; McDonald (MAC), Fox Road (FOX), Ferry Bluff (FER), Cassell Road (CAS), Blackhawk (BHK), and Sugarloaf (SRL).

Roost counts were done once a week starting on 30 October 1990 at BRC, and NLA,; on 27 November at EGV, SRL, BHK, CAS, FER, FOX, MAC, and on 15 January at GEN, LAN; all counts were discontinued no later than 2 April 1991. Roost counts began one and a half hours before sunset, and ended when there was insufficient light to clearly see the roost, about a half hour after sunset. At each roost site a minimum of one observer was placed near the roost in a position to fully observe the area.

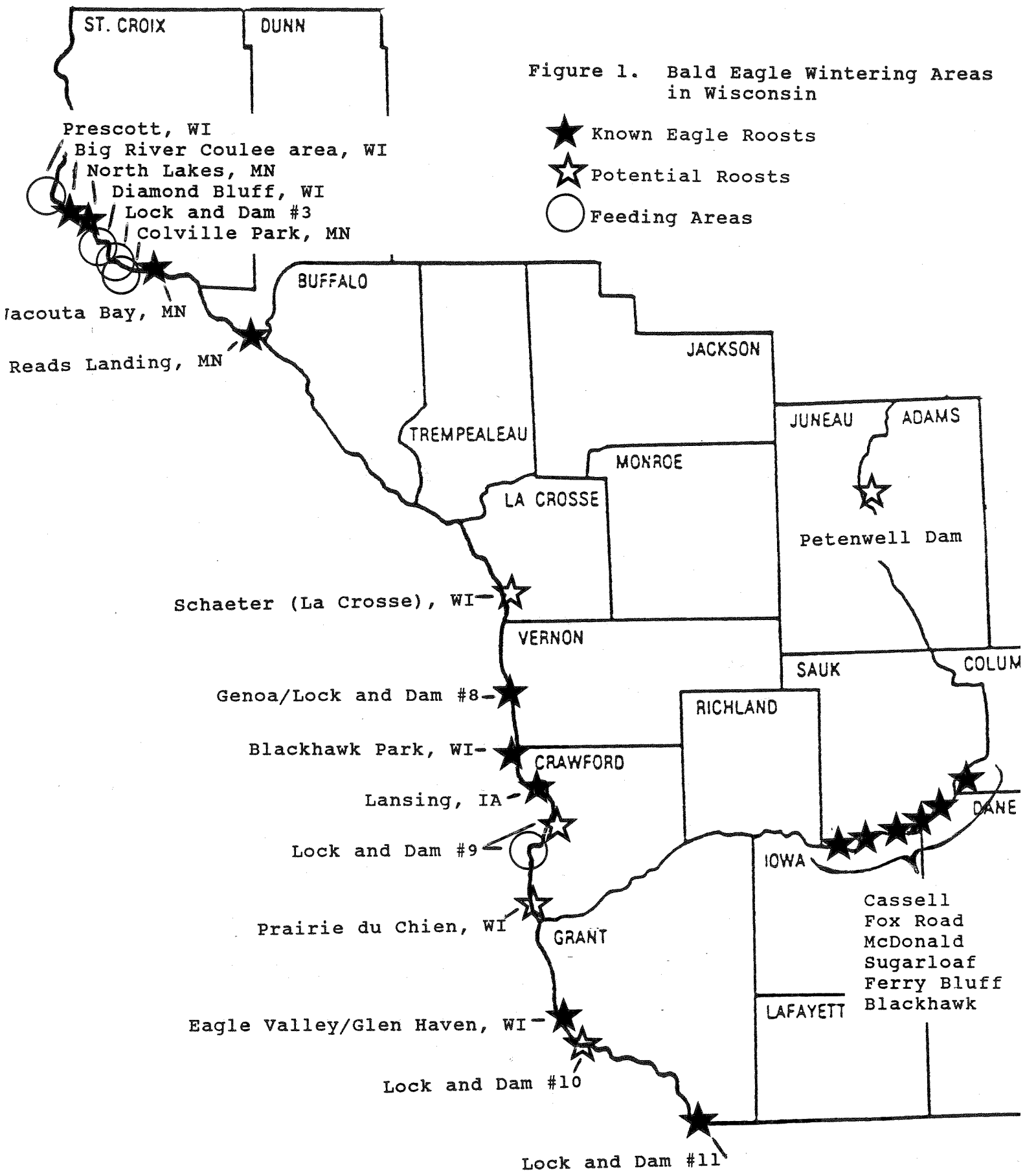
While at the roosts, we recorded the temperature, wind speed

and direction, cloud cover, river ice conditions, number of eagles seen in the roost, numbers of eagles seen but not roosting, and their ages. An eagle was aged as an adult if it had a complete white head and tail, and immature if it was brown with no white head or tail feathers (Stalmaster 1987).

Transitional birds, or those with varying amounts of white and brown on their head and tail, were classified as immatures.

Eagles were classified as unknown if we could not confidently identify them as adult or immature due to poor light conditions or distance. Eagle locations were recorded on USGS 1:24,000 maps. All observations were aided by the use of 20x - 60x spotting scopes and binoculars.

Three aerial surveys to count wintering eagles along the Mississippi River were flown by John Olson, John Nelson, Greg Stacey, and Darwin Krall of the Wisconsin Department of Natural Resources. All three flights were made from La Crosse WI to Dubuque IA. The first flight was on 9 January 1991, the second was on 5 February 1991, and the third was on 15 March 1991. Two flights were made along the Wisconsin River from the Dells Dam to the rivers confluence with the Mississippi. These flights were made on 18 January 1991 by G. Stacey, J. Speth, and G. Fannucchi and 25 February 1991 by G. Stacey and G. Fannucchi.



RESULTS/DISCUSSION

Eagles have been recorded in many parts of Wisconsin during the winter, and we were able to document a number of historic and current Bald Eagle winter use areas through literature searches and interviews. The areas listed below are those reported on most often or with highest eagle numbers and probably represent the most important wintering areas in the state.

Petenwell Dam/Adams County ... Records exist for wintering eagles in this area beginning in 1954 and extending to the current time. The number of birds recorded varied from 3 to 70, with most of the counts ranging from 20 to 40 birds.

Ferry Bluff Area ... This area on the Wisconsin River extends from Sauk City to Spring Green in Sauk County and includes Mazomanie in Dane County. Eagles have been documented from 1945 to the present. High counts include 201 (1989), 50 (1977), 46 (1988), although most of the counts ranged between 20 to 50. Open water year round and new nesting territories make this area along with Pentenwell Dam an important site for migrating and wintering eagles.

Other Areas on the Wisconsin River ... Bald Eagles are seen downriver of Wisconsin Dells as far as Portage during the winter, although no organized counts have been made (D. Erickson pers. obs.). Poynette and Richland Center are the two other areas near the Wisconsin River which are most often mentioned in Christmas

bird counts. The highest record is 36 eagles from Richland Center in 1988 although in most other years the records are in the single digits. Poynette with its proximity to Ferry Bluff has wintering eagle records but does not seem to be a major area of use.

St. Croix River ... The St. Croix River freezes over during the winter, but small pockets of open water provide habitat for a few eagles. These pockets occur near Hudson, where up to 13 birds have been recorded, and at the mouth of the Kinnikinic River where we have observed a few birds during the past 3 years. This river is not a significant Bald Eagle wintering area.

Prescott ... Located at the confluence of the St. Croix and Mississippi Rivers, Prescott has open water year round providing eagle foraging areas. Eagles have been recorded in this area since 1961. Large numbers of birds have not been recorded in this area although it is very important during migration and periods of extremely cold weather. Written and oral reports indicate that this area is used every year by eagles.

Big River Coulee/North Lake ... Big River Coulee is located 2.5 km south of Prescott. North Lake is a Minnesota DNR Wildlife Management Area 1.5 km south of Big River Coulee. No historical records of eagle use in this area have been found. Systematic observations by personnel from The Raptor Center began in 1988 and have continued to the present. The highest number of eagles

we recorded here was 45 at North Lake (April 1990).

Prairie Island/Lock and Dam #3 ... Warm water discharged from the Prairie Island Nuclear Power Plant located upriver from Red Wing, MN creates a foraging area for wintering eagles. Discussions with local residents indicates that eagles began using this area only after the power plant was built. Ground counts, which are not an effective way of censusing this area, indicate up to 40 birds feeding here. We have not been able to locate a roost in this area.

Colvill Park/Wacouta Bay ... There is no historic data indicating Bald Eagle use of this area, although it currently is used by up to 60 birds a day. Colvill Park, which is located south of Red Wing, Minn., is used as a feeding and resting area. Wacouta Bay, which is approximately 1.5 km south of the park, has been used by up to 47 eagles (1990) for roosting. This roost is used very consistently during the winter by local birds.

Reads Landing ... Counts and observations have been conducted here since the early 1970's although little of it is available in the literature. This area, which is located at the mouth of the Chippewa River, is well known to bird watchers and others as a prime eagle feeding and roosting area. Christmas counts are available from nearby Nelson, Wis. since 1978. These range from 4 in 1980 to 98 in 1986. We assume that these birds were roosting at Reads Landing.

LaCrosse ... Eagles have been reported in the LaCrosse area since 1969 when 56 eagles were counted. Few reports exist from the 1970's but beginning in 1980 Christmas bird count have been done almost every year. Typically less than 10 birds are seen although 23 were seen in 1987.

Grant County ... Counts have been conducted for many years in Grant County. The first count we found was of 12 eagles in 1940. Since that time counts of up to 302 eagles (1983) have been recorded. Christmas bird counts from Beetown, and data collected by the Eagle Valley Environmentalists, provide a clear picture of a well used and important wintering area in Wisconsin. The Eagle Valley Roost, located near Glen Haven, has been protected since the 1970's, first by the Eagle Valley Environmentalists, and currently by the Kohler Company.

1990 - 1991 ROOST COUNT RESULTS

The roosts studied did not receive equal amounts of use by eagles. Roosts, particularly those on the Mississippi River were not used consistently by eagles. We often saw eagles sitting individually or in small groups in trees on the Mississippi River at dusk and dawn leading us to believe that the birds were not always going to communal roosts. Eagles were also seen at inland sites away from the river in both the Lansing, IA, Eagle Valley and Sauk City areas. These birds were seen feeding at nearby livestock operations.

Mississippi River

The highest concentrations of eagles seen at any roost during this study was at Lansing, IA on 29 and 30 January with 131 and 158 eagles seen respectively (Table 7). The number of eagles here dropped off sharply after this date however. The eagles roosted on an Iowa bluff overlooking an area which is kept open by warm water discharged from the Interstate Power Plant. This probably provides a permanent location at which the eagles can feed when other portions of the river freeze over. We were not aware of the existence of this roost until it was discovered by one of our volunteers, Pat Skewes, in mid-January. Further monitoring of this area is needed to determine the extent of its use.

Eagle Valley recorded 41 eagles on 19 February, although 71 birds were seen leaving the roost the following morning (20 February). Eagles were recorded in this roost on 7 of the 18 Tuesdays (39%) on which counts were made. The roost was used almost nightly through 11 March, but no birds stayed in the roost on Tuesday 5 March which was a very warm evening. The following evening 6 March 32 eagles were counted. A blizzard on 12 March hindered observations.

Lock and Dam #8 at Genoa, Wis. provides open water used by eagles for foraging. We observed up to 30 eagles in this area during the day, but they typically left at dusk and flew to the west and south-west. We were unable to determine where these birds roosted although an extensive area of bottom woodlands in

Minnesota should provide excellent roosting opportunities and is a likely roost spot. We did observe some eagles roosting a few miles south of Lock and Dam #9 near Blackhawk Park, but we were unable to obtain accurate counts there. An effort should be made to locate the roost of the birds feeding in the Genoa area.

Frozen water during most of the winter kept eagles from roosting in the LaCrosse area, although they are reported to be common during migration and other times when there is open water. The other two roosts observed, Big River and North Lake, were not used as heavily as the other areas under observation on the Mississippi River. Big River had a high count of 4 birds on 12/18/91 and had no birds on 9 of the 17 evenings observed (53%). This is less use than we observed here in 1988-89 and 1989-90. We do not know if this drop-off is due to weather or the result of some habitat change in or around the roost. Recent residential developments on top of the surrounding bluffs could be interfering with the eagles use of this roost.

Wisconsin River

The highest number of eagles recorded at the Sauk City/Prairie du Sac Roosts (Wisconsin River) was 86 birds on 1 January (Table 11). An average of 49 birds were seen in this area during January, while an average of 35 birds were seen in February. Of the six roosts in the area, Sugarloaf received the most use with an average of 26 birds roosting there at each count (n=7) (Tables 12, 28).

From the beginning of January the highest counts of eagles occurred at Sugarloaf except on 8 January when more eagles used the Blackhawk Roost. During January and February, Blackhawk and Ferry Bluff also had significant use by eagles with an average of 16 (n=5) (Tables 14, 28) and 11 (n=4) (Tables 16, 28) birds per night occupied, respectively. Cassell Road (x=3, n=3) (Tables 18, 28), Fox Road (x=1, n=4) (Tables 20, 28), and McDonald (x=0, n=2) (Tables 22, 28) roosts received little to no use most weeks. This is not consistent with use of the area seen in past years. Bald Eagle numbers appeared to be higher in previous years, and use of the Ferry Bluff, McDonald and Fox Road roosts in particular were greater in 1988 -1990. Weather patterns are the most likely explanation for these differences.

The results of the daytime aerial counts of the Mississippi River are presented in Tables 24, 25, and 26 and the results of the Wisconsin River aerial surveys are in Table 27. On all of these counts adults outnumbered immatures at least 3:1. The numbers of birds counted increased each month in both surveys. This probably reflected eagle movements back north along the river, but may also be a reflection of increased capability of the pilot and observer as they became more familiar with the censusing techniques and geography of the area.

Except for the 18 January flight on the Wisconsin River, the aerial surveys recorded more birds than our roost counts. A couple of factors may account for this. First, eagles can be very difficult to count along the river from the ground. Limited

access prevents many areas from being counted from the ground that can be seen from the air. Secondly, it seems that not all of the birds along the river are using the communal roosts. This is also apparent from the variations in counts from week to week at each roost. Third, there may be roosts yet to be found to which some of these birds are going. Most likely a combination of all three explanations accounts for the discrepancies noted.

At both the Mississippi and Wisconsin river roosts, adult Bald Eagles generally outnumbered immatures (Table 29). This ranged from 5.7:1 on the Mississippi River during December to 1:1 on the Wisconsin River in February. No single weather condition seemed to determine if eagles chose to use a roost or not. We suspect that a combination of daily and long term weather factors, particularly temperature and wind speed, as well as availability of open water determine eagle use of any particular roost. The Mississippi River had higher concentrations of eagles than the Wisconsin River during January and February, the only months for which we have sufficient data.

CONCLUSIONS/RECCOMENDATIONS

All counts of wintering eagles currently used should be regarded as conservative estimates of the true numbers of birds in the area. Aerial flights currently being conducted limit themselves to the river valley and do not always count birds on bluffs or feeding at inland sites. Our observations of birds during the day would indicate that quite a few eagles are not feeding on the river but going to inland sites. On the other hand ground counts at roosts and feeding areas are limited by the inaccessibility of many sites and the difficulty of obtaining accurate count of birds in failing light.

In spite of the fact that not all of the roosts were used at each visit, communal roost sites still must be considered critical to the maintenance of healthy Bald Eagle populations in Wisconsin and the surrounding states. Management options need to be explored and the welfare of these roosts should be of primary importance when land use decisions are being made, both at the roost, and at surrounding areas.

Due to the yearly variation in wintering eagle numbers and the apparent influences exerted by weather, the amount of open water, and the availability of food we believe that continued monitoring of these roosts and searches for other roosts should continue. Experiences at Eagle Valley indicate that counts of eagles may be more effective if conducted at dawn. This possible change in protocol should be investigated at more sites. The nesting origin of birds using the Wisconsin and Mississippi

Rivers remains a mystery and attempts at determining this should be made. This could be done through observation stations at feeding sites or through marking and radio-tagging of birds on the wintering ground. Finally, the presence of contaminants in the ecosystems of both rivers suggests that a study to monitor contaminants in wintering eagles is needed. This study should be conducted in conjunction with other contaminant studies currently being done in the state, and could be done along with some of the other research mentioned above.

APPENDIX I

A PARTIAL BIBLIOGRAPHY OF BALD EAGLE USE OF THE MISSISSIPPI AND WISCONSIN RIVERS, AND WINTERING BALD EAGLE BIOLOGY

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APPENDIX II

DATA TABLES

Table 1

Number of Bald Eagles seen roosting in Big River Coulee Roost:
Winter 1990 - 1991

Date	Adult	Immature	Unknown Age	Total
10/30/90	0	0	0	0
11/06/90	0	0	0	0
11/13/90	1	1	0	2
12/04/90	0	1	0	1
12/11/90	0	0	0	0
12/18/90	3	0	1	4
01/03/91	0	0	0	0
01/08/91	0	0	0	0
01/15/91	2	0	0	2
01/29/91	1	0	0	1
02/12/91	0	0	0	0
02/19/91	0	0	0	0
02/26/91	2	0	0	2
03/06/91	0	0	1	1
03/19/91	1	0	0	1
03/26/91	0	0	0	0
04/02/91	0	0	0	0

Table 2

Number of Bald Eagles seen but not roosting
in the Big River Coulee Roost: Winter 1990 - 1991

Date	Adult	Immature	Unknown Age	Total
10/30/90	0	0	0	0
11/06/90	1	1	0	2
11/13/90	0	1	0	1
12/04/90	4	0	2	6
12/11/90	1	0	1	2
12/18/90	2	0	1	3
01/03/91	3	0	1	4
01/08/91	2	0	0	2
01/15/91	3	0	0	3
01/29/91	2	1	1	4
02/12/91	6	2	0	8
02/19/91	1	0	0	1
02/26/91	5	2	0	7
03/06/91	6	1	3	10
03/12/91	6	1	0	7
03/19/91	1	0	1	2
03/26/91	5	0	2	7
04/02/91	1	3	0	4

Table 3

Number of Bald Eagles seen roosting at North Lake Roost:
Winter 1990 - 1991

Date	Adult	Immature	Unknown Age	Total
10/30/90	0	0	0	0
11/01/90	0	1	0	1
11/06/90	0	0	0	0
12/04/90	8	1	0	9
12/11/90	0	0	0	0
01/03/91	0	0	0	0
01/15/91	5	1	0	6
02/12/91	22	1	0	23
02/19/91	13	0	0	13
03/05/91	12	5	1	18
03/12/91	12	8	1	21
03/19/91	14	3	4	21
03/26/91	8	7	0	15
04/02/91	1	1	0	2

Table 4

Number of Bald Eagles seen but not roosting,
North Lakes Roost: Winter 1990 - 1991

date	Adult	Immature	Unknown Age	Total
10/30/90	0	0	0	0
11/01/90	0	0	0	0
11/06/90	1	3	0	4
12/04/90	10	1	0	11
12/11/90	0	0	3	3
01/03/91	1	0	0	1
01/15/91	1	0	0	1
02/12/91	0	0	0	0
02/19/91	0	0	0	0
03/15/91	0	0	0	0
03/12/91	11	3	0	14
03/19/91	0	0	0	0
03/26/91	0	0	0	0
04/02/91	0	0	0	0

Table 5

Number of Bald Eagles seen roosting at Genoa, Wis. Roost:
Winter 1990 - 1991

Date	Adult	Immature	Unknown Age	Total
01/15/91	3	1	0	4
01/23/91	0	0	0	0
02/06/91	3	0	1	4
02/12/91	1	1	1	3
02/26/91	0	0	10	10

Table 6

Number of Bald Eagles seen but not roosting, Genoa Wis. Roost:
Winter 1990 - 1991

Date	Adult	Immature	Unknown Age	Total
01/15/91	0	0	0	0
01/23/91	1	0	0	1
02/06/91	1	0	1	2
02/12/91	5	1	3	9
02/26/91	22	11	5	38

Table 7

Number of Bald Eagles seen roosting at Lansing, IA Roost:
Winter 1990 - 1991

Date	Adult	Immature	Unknown Age	Total
01/12/91	0	0	63	63
01/22/91	47	13	10	70
01/29/91	80	24	27	131
01/30/91	75	19	64	158
02/02/91	0	0	41	41
02/05/91	22	5	2	29
02/12/91	6	4	0	10
02/14/91	9	8	4	21
02/19/91	3	7	0	10
02/26/91	1	0	0	1
03/05/91	0	0	0	0

Table 8

Number of Bald Eagles seen but not roosting
Lansing, IA Roost: Winter 1990 - 1991

Date	Adult	Immature	Unknown Age	Total
01/12/91	0	0	8	8
01/22/91	25	3	6	34
01/29/91	24	6	4	34
01/30/91	0	0	28	28
02/02/91	0	0	0	0
02/05/91	0	0	0	0
02/12/91	1	1	0	2
02/14/91	0	0	0	0
02/19/91	0	0	0	0
02/26/91	4	3	0	7
03/05/91	4	0	0	4

Table 9

Number of Bald Eagles seen roosting at Eagle Valley Roost:
Winter 1990 - 1991

Date	Adult	Immature	Unknown Age	Total
11/27/90	4	0	0	4
12/04/90	0	0	0	0
12/11/90	0	0	0	0
12/18/90	0	0	0	0
01/01/91	0	0	0	0
01/08/91	0	0	0	0
01/15/91	0	0	0	0
01/22/91	16	2	0	18
01/29/91	20	10	0	30
02/05/91	1	1	1	3
02/12/91	3	1	0	4
02/19/91	28	13	0	41
02/20/91*	38	16	17	71
02/26/91	12	13	0	25
03/05/91	0	0	0	0
03/12/91**	0	0	0	0
03/19/91	0	0	0	0
03/26/91	0	0	0	0
04/02/91	0	0	0	0

* AM Count of eagles leaving roost

** Blizzard - No visibility

Table 10

Number of Bald eagles seen but not roosting
at Eagle Valley Roost: Winter 1990 - 1991

Date	Adult	Immature	Unknown Age	Total
11/27/90	1	1	0	2
12/04/90	3	1	13	17
12/11/90	5	5	4	14
01/01/91	0	0	1	1
01/05/91	0	0	0	0
01/15/91	2	0	0	2
01/22/91	16	3	0	19
01/29/91	25	10	0	35
02/05/91	1	3	1	5
02/12/91	17	4	2	23
02/19/91	0	0	60	60
02/26/91	0	0	0	0
03/05/91	11	0	3	14
03/12/91	0	0	0	0
03/19/91	2	1	0	3
03/26/91	0	0	0	0
04/02/91	0	0	0	0

Table 11

Number of Bald Eagles Roosting
in the Sauk City/Prairie du Sac Area (Wisconsin River):
1990-1991

Date	Adult	Immature	Unk. Age	Total
11/27/90	1	0	0	1
12/18/90	16	13	3	32
01/01/91	55	26	5	86
01/08/91*	34	9	7	50
01/15/91*	18	8	2	28
01/22/91	18	10	5	33
01/29/91**	12	6	0	18
02/05/91	14	21	6	41
02/12/91	14	3	8	25
02/19/91	8	11	18	37

* Sugarloaf and Blackhawk Roosts Only

** Blackhawk Roost only

Table 12

Number of Bald Eagles seen roosting at
Sugarloaf, Wis Roost: Winter 1990 - 1991

Date	Adult	Immature	Unknown Age	Total
11/27/90	0	0	0	0
12/18/90	0	0	0	0
01/01/91	29	14	1	44
01/08/91	14	6	2	22
01/15/91	17	8	2	27
01/22/91	11	8	3	22
02/05/91	5	15	3	23
02/12/91	14	3	8	25
02/19/91	0	0	17	17

Table 13

Number of Bald Eagles seen but not roosting
at Sugarloaf, Wis. Roost: Winter 1990 - 1991

Date	Adult	Immature	Unknown Age	Total
11/27/90	0	0	0	0
12/18/90	2	0	0	2
01/01/91	0	0	0	0
01/08/91	0	0	0	0
01/15/91	0	0	0	0
01/22/91	0	0	0	0
02/05/91	0	0	0	0
02/12/91	0	0	0	0
02/19/91	0	0	50	50

Table 14

Number of Bald Eagles Roosting at Blackhawk Roost:
Winter 1990 - 1991

Date	Adult	Immature	Unknown Age	Total
11/27/90	1	0	0	1
12/18/90	5	5	0	10
01/01/91	15	7	0	22
01/08/91	20	3	5	28
01/15/91	1	0	0	1
01/22/91	0	0	0	0
01/29/91	12	6	0	18
02/05/91	0	0	0	0
02/12/91	0	0	0	0
02/19/91	2	9	0	11

Table 15

Number of Bald Eagles seen but not roosting
at Blackhawk Roost: Winter 1990 - 1991

Date	Adult	Immature	Unknown age	Total
11/27/90	1	0	0	0
12/18/90	0	0	1	1
01/01/91	12	6	0	18
01/08/91	4	3	0	7
01/15/91	4	1	1	6
01/22/91	6	5	0	11
01/20/91	2	2	0	4
02/05/91	0	1	0	1
02/12/91	0	3	1	4
02/19/91	7	4	5	16

Table 16

Number of Bald Eagles roosting at Ferry Bluff Roost:
Winter 1990 - 1991

Date	Adult	Immature	Unknown Age	Total
11/27/90	0	0	0	0
12/18/91	7	4	3	14
01/01/91	9	5	1	15
01/22/91	3	1	1	5
02/05/91	7	5	3	15
02/19/91	6	2	1	9

Table 17

Number of Bald Eagles seen but not roosting
at Ferry Bluff Roost: Winter 1990 - 1991

Date	Adult	Immature	Unknown age	Total
11/27/90	0	0	0	0
12/18/90	0	0	0	0
01/01/91	1	0	0	1
01/22/91	0	0	0	0
02/05/91	0	0	0	0
02/19/91	8	3	1	12

Table 18

Number of Bald Eagles Roosting at Cassell Road Roost:
Winter 1990 - 1991

Date	Adult	Immature	Unknown Age	Total
11/27/90	0	0	0	0
12/18/90	0	0	0	0
01/01/91	0	0	3	3
01/22/91	2	1	1	4
02/05/91	1	1	0	2

Table 19

Number of Bald Eagles seen but not roosting
at Cassell Road Roost: Winter 1990 - 1991

Date	Adult	Immature	Unknown Age	Total
11/27/90	0	0	0	0
12/18/90	0	0	0	0
01/01/91	1	0	0	1
01/22/91	2	0	0	2
02/05/91	0	1	0	1

Table 20

Number of Bald Eagles roosting at Fox Road Roost:
Winter 1990 - 1991

Date	Adult	Immature	Unknown Age	Total
11/27/90	0	0	0	0
12/18/90	4	3	0	7
01/01/91	2	0	0	2
01/22/91	2	0	0	2
02/05/91	1	0	0	1
02/19/91	0	0	0	0

Table 21

Number of Bald Eagles seen but not roosting
at Fox Road Roost: Winter 1990 - 1991

Date	Adult	Immature	Unknown age	Total
11/27/90	0	0	0	0
12/18/90	0	1	0	1
01/01/91	0	0	0	0
01/22/91	0	1	0	1
02/05/91	0	0	0	0
02/19/91	0	0	0	0

Table 22

Number of Bald Eagles roosting in McDonald Roost:
Winter 1990 - 1991

Date	Adult	Immature	Unknown Age	Total
11/27/90	0	0	0	0
12/18/90	0	1	0	1
01/01/91	0	0	0	0
02/05/91	0	0	0	0

Table 23

Number of Bald Eagles seen but not roosting
at McDonald Roost: Winter 1990 - 1991

Date	Adult	Immature	Unknown Age	Total
11/27/90	0	0	0	0
12/18/90	0	0	0	0
01/01/91	0	0	0	0
02/05/91	0	0	0	0

Table 24

Results of the 9 January 1991 Mississippi River Aerial Survey
LaCrosse to Dubuque, IA

Location	Number of eagles seen		Total
	Adult	Immature	
Wisconsin	87	14	101
Minnesota	32	11	43
Iowa	18	4	22
Total	137 (82.5%)	29 (17.5%)	166

Conducted by John Olson and Darwin Krall

Table 25

Results of the 13 February 1991 Mississippi River Aerial Survey
LaCrosse to Dubuque, IA

Location	Number of eagles seen		Total
	Adult	Immature	
Wisconsin	130	37	167
Minnesota	7	7	14
Iowa	49	9	58
Total	186 (78%)	53 (22%)	239

Conducted by John Olson and Darwin Krall

Table 26

Results of the 15 March 1991 Mississippi River Aerial Survey
LaCrosse to Dubuque, IA

Location	Number of eagles seen		Total
	Adult	Immature	
Wisconsin	214	84	298
Minnesota	33	7	40
Iowa	62	14	76
Total	309 (75%)	105 (25%)	414

Conducted by John Olson, John Nelson, and Greg Stacey

Table 27

Results of the 18 January and 25 February 1991
Wisconsin River Eagle Survey
Lake Delton to the Confluence of Miss. and Wis. rivers
Conducted by Greg Stacey, Genny Fannucchi and J. Speth

Date	Number of Bald Eagles Seen		Total
	Adult	Immature	
18 January 1991	11 (92)	1 (8)	12
25 February 1991	67 (83)	14 (16)	81

Table 28

Average Number of Roosting Eagles Seen Between
18 December 1990 and 2 April 1991

Location	(x)	(h)	(l)	(n)
Big River Coulee	2	4	1	8
North Lake	13	23	1	10
Genoa	5	10	3	4
Lansing	53	158	1	10
Eagle Valley	22	71	3	7
Sugarloaf	26	44	17	7
Blackhawk	15	28	1	6
Ferry Bluff	12	15	5	5
Cassell	3	4	2	3
Fox Road	3	7	1	4
McDonald	1	1	1	1

Average number of Bald Eagles seen (x), High (h), Low (l),
Number of times area counted (n)

Table 29

Number of Adult and Immature Bald Eagles Seen in roosts
on the Wisconsin and Mississippi Rivers Winter 1990-1991

River	Month	Adults	Immature	Total
Wisconsin	December	16 (55%)	13 (45%)	29
Mississippi	December	22 (85%)	2 (15%)	24
Wisconsin	January	137 (70%)	59 (30%)	196
Mississippi	January	249 (78%)	70 (22%)	319
Wisconsin	February	36 (51%)	35 (49%)	71
Mississippi	February	136 (70%)	57 (30%)	193
Mississippi	March	47 (67%)	23 (33%)	70