USE OF THE KENAI NATIONAL WILDLIFE REFUGE'S UPPER KENAI RIVER BY OVERWINTERING BALD EAGLES

Annual Progress Report
1984

by
Theodore N. Bailey
Edward E. Bangs

Key Words: Bald eagles
Kenai River
overwintering numbers
radiotelemetry
movements

Kenai National Wildlife Refuge
P. O. Box 2139
Soldotna, Alaska 99669-2139

October 1984

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

EXECUTIVE SUMMARY OF PUBLICATION OR REPORT

	Refereed publication
	Non-refereed publication
	Unpublished presentation to conference or workshop
X	Internal administrative report
	Other (see remarks)

TITLE: Use of the Kenai National Wildlife Refuge's Upper Kenai River by Overwintering Bald Eagles

DATE: October 31, 1984

I.D. NO. 74525-82-04

AUTHOR(S)

T.N. Bailey and E.E. Bangs

CITATION: 1984. Kenai National Wildlife Refuge Annual Prog. Rpt. (Unpublished), U.S. Fish & Wildlife Service, Soldotna, AK 10pp.

OBJECTIVE:
1. Determine number and population composition of overwintering bald eagles.
2. Document distribution of overwintering bald eagles.
3. Obtain data on feeding habits and mighttime roosting areas
4. Document winter and year-round movements of overwintering eagles.

METHOD OF STUDY
1. Aerial surveys (October-April)
2. Boat surveys (October-April)
3. Capture, leg banding and radio transmitter harnesses attachment.
4. Aerial monitoring of radio-equipped eagles.

MAIN FINDINGS
1. Numbers of eagles increased from October 1983, peaked in January 1984, and declined through March.
2. Peak numbers observed in January were 283 (boat survey) and 201 (aerial survey).
3. Aerial surveys miss 3-69% of eagles depending on various sightability factors.
4. Three radio monitored eagles suggested overwintering eagles come from areas off the Kenai Peninsula.

CONCLUSIONS
1. The Upper Kenai River is an important overwintering area for bald eables because it often remains ice-free throughout the winter and there is an abundant food supply in the form of spawned-out coho salmon carcasses.
2. Eagles move on to the Kenai River from great distances during the winter, at least 50 miles.

MANAGEMENT IMPLICATIONS
1. Any significant increase in public use along the Upper Kenai River in the winter could impact eggle use of the river.
2. Changes in coho salmon escapement could influence the eagle's food supply and hence their overwinter survival.

ADDITIONAL REMARKS

This report covers the first winter (1983-84) of the study.

UPDATES OR SUPERSEDES I.D. NO.

PROGRAM

Refuges

FOR COPIES OF PUBLICATION OR REPORT CONTACT

Kenai National Wildlife Refuge
P. O. Box 2139
Soldotna, AK 99669-2139 (907) 262-7021

1. Title: Use of the Kenai National Wildlife Refuge's upper Kenai River by overwintering Bald Eagles (Revised)

2. Project Number: 74525-82-04

3. Objectives:

    1. To determine the number and population composition of bald eagles wintering on the upper Kenai River within and adjacent to the Kenai National Wildlife Refuge.

    2. To determine and map areas intensively used on the Kenai NWR as feeding and daytime perching areas by bald eagles.

    3. To collect baseline data on the feeding habits of bald eagles wintering on the Kenai River

    4. To locate and describe nighttime roosting areas used by overwintering bald eagles.

    5. To document winter movements of bald eagles along the upper Kenai River and seasonal movements to and/or from these wintering areas.

4. Justification:

The Kenai River is perhaps the most heavily-used outdoor recreational area is southcentral Alaska because of its excellent salmon fishery. This area is not only attracting the development of recreation-oriented dwellings and businesses, but is also an area of rapidly-expanding industrial development related to petroleum resources located on the Kenai Peninsula and in Cook Inlet (U.S. Army Corps of Engineers 1978). Concern over the rapid development and use of the Kenai River and the impacts on fish and wildlife resources were one of the reasons for establishing a special task force in 1982 to make recommendations on management of the river to the Governor of Alaska.

Because of rapid development along the Kenai River, the last remaining undeveloped and least disturbed sections of the river lie within the Kenai National Wildlife Refuge. In the past several years, concentrations of bald eagles have been observed along the upper sections of the river primarily within the Kenai National Wildlife Refuge. Aerial surveys along the river in January 1982 and March 1983, revealed a minimum number of 57 and 53 bald eagles, respectively. The vast majority of overwintering eagles during the 1982 survey were located along a one mile region of river below Skilak Lake on the refuge in T 4 N, R 8 W, S 1 - a section selected by the Kenai Native Association. During the 1983 survey, 70% of the bald eagles were observed on the refuge below the outlet of Skilak Lake. Because of difficulty observing bald eagles, particularly immatures, from the air, it is believed the actual numbers of eagles overwintering on the upper Kenai River is much greater, perhaps twice as great or more, as the number observed during the brief aerial surveys. A preliminary feasibility study using 5 radio transmitters in 1982, revealed that eagles reared on the refuge, used the Kenai River corridor and flew as far east as Seward. The continued rapid development along the Kenai River off the refuge, the increasing use of the entire river, and potential changes in forest habitats adjacent to the river on and off the refuge which may serve as bald eagle roosting sites, necessitate that the importance of the upper Kenai River to overwintering bald eagles be documented as soon as possible.

In summarizing the management of wintering bald eagles, Steenhof and Brown (1978) emphasized that the proper management of wintering sites is essential for preserving and enhancing bald eagle populations, especially as human encroachment concentrates bald eagles into smaller and fewer sites where habitat and food are adequate. As development occurs along the Kenai River, we can expect eagles also to be concentrated into smaller areas. Steenhof and Brown also stressed that communal roosts should be identified and preserved, noted that boating was especially disruptive to eagle activity patterns, reported that powerlines at eagle wintering sites are especially hazardous because they can be a significant cause of eagle mortality, and recommended restriction of public use to designated zones to minimize disturbance to wintering eagles. Nothing is known about the existence or locations of bald eagle communal roosts along the Kenai River, boat traffic on the river is

increasing annually with use occurring earlier in the year when eagles are still present, powerlines run adjacent to bald eagle wintering areas between river miles 70 through 80, and there area currently no restrictions on public use, except off-road vehicles, in the refuge's bald eagle eagle wintering areas. It is essential to locate any communal roosts, if they exist, as quickly as possible in order to protect them from being destroyed by fire, mechanical manipulation, and/or land exchanges.

5. Procedures:

A. Methods and Materials:

Objective 1: Both boat and aerial surveys will be conducted along the Kenai River from October through March for 3 winters (1983-84, 1984-85, 1985-86). Monthly aerial surveys will include the Kenai River from the confluence of the Moose River to Skilak Lake (Route 1), Skilak Lake to Russian River (Route 2), and Russian River to Kenai Lake (Route 3)(Fig. 1). Intensive surveys via boat will occur between river miles 40 through 50 in Route 1, and between river miles 69 through 74 in Route 2, and between river miles 74 through 82 in Route 3, at least once monthly from October through March. Total numbers, relative ages, location, and activity of eagles will be recorded during boat surveys. Total numbers, ages (as practical), and approximate locations will be recorded during aerial surveys. Aerial surveys will be conducted with the refuge PA-18 Supercub or Cessna 206. Boat surveys will be conducted from a raft, boat, or canoe. A 10-45x spotting scope and 10-35x binocular will be used on the boat surveys. Weather permitting, surveys will be conducted during the same time of day (1300-1600 for aircraft, 1000-1600 boat survey) to reduce behavioral variability.

Objective 2: Detailed maps will be prepared for the riparian corridor adjacent to the Kenai River on the Kenai NWR between river miles 45-50 and 70-74. Maps will be prepared from existing aerial photographs and actual observations during the ground surveys. Eagles observed during the ground surveys will be accurately plotted on these maps to identify key use areas. Individual's trees intensively used by feeding eagles as perching trees may be identified, measured, and characterized by height, diameter, number, and structure of branches.

Objective 3: During the boat surveys, any food observed being eaten or believed to have been eaten by bald eagles will be recorded. If food items can be examined closely, they will be described by species, sex, size, and condition, if practical. An attempt will be made to locate and collect castings from perch trees for analysis of prey remains in the laboratory. Records will be maintained on the relative abundance of fish, particularly salmon, and the availability of carcasses of fish during the boat surveys.

Objective 4: Two techniques will be used to locate communal roosting areas: direct observations and radio telemetry. The directions eagles fly to and from the feeding areas will be determined, if practical, to help locate roosting areas. In addition, up to 10 bald eagles will be captured in either padded No. 3 foot traps, set near salmon carcasses, or by a rocket net, and fitted with a standard USFWS leg band, and a small (75-80 gm) radio transmitter attached. These radios will be used to locate communal roosts by using ground triangulation and perhaps aerial locations, if practical. Radios will be attached to eagles in a back-pack harness arrangement.

Objective 5: The locations of radio-equipped bald eagles will be determined by ground and aerial radio tracking to determine the extent of their movements along the Kenai River during the winter. Once the eagles leave the Kenai River, a radio-monitoring flight will be accomplished monthly along the eastern and western coastlines of the Kenai Peninsula. A bi-weekly flight will occur along the western side of Cook Inlet from the Susitna River to the Tuxedni River. This will document the significance of the area to eagles on the Kenai Peninsula and the Cook Inlet Region.

B. Results: The results of the study will be combined with past bald eagle survey and telemetry data, integrated with salmon harvest and escapement data for the Kenai River and be presented in a final report with recommendations by September 30, 1986. One or more scientific and/or technical publications may be derived from the final report.

C. Interpretation: This information will be used to develop a bald eagle management plan for the Kenai National Wildlife Refuge. It will also be used to develop public use plans for use of the Kenai River on the refuge and to protect bald eagle communal roosting sites discovered in forest habitats on the refuge from accidental or prescribed fires, logging, fire wood cutting, and mechanical vegetation manipulation.

6. Cooperators: The information obtained from the project will be disseminated to borough, State, and Federal agencies who have responsibility for managing resources on the upper Kenai River adjacent to the refuge. Since the other major, single, land owner on the upper Kenai River is the U.S. Forest Service, any on-ground operations which may occur on Forest Service lands will be coordinated through the appropriate personnel in the Seward office.

7. Responsibilities: This project will be conducted by the Kenai NWR staff with the aid of 2-4 seasonal volunteers. Refuge Manager Robert L. Delaney is ultimately responsible for all Kenai NWR projects and the Principal Investigator will be Refuge Fish & Wildlife Biologist Theodore N. Bailey. He, Wildlife Biologist Edward E. Bangs, Biological Technician Mary Portner, and biological volunteers will conduct the field studies.

8. Costs: The cost of the project excluding salaries are:

I. Equipment and Support

	Estimated Costs		
Equipment	FY 83-84	FY 84-85	FY 85-86
Radio Transmitters (10)	$2,200	$2,400	$2,600
Back-pack harnesses	300	350	400
Batteries, tape, etc.	200	200	200
Support			
Vehicle	1,500	1,600	1,800
Aircraft	3,000	3,200	3,400
Data Analysis	300	500	200
Publication Costs	-----	-----	800
Subtotal	$7,500	$8,250	$9,400

II. Salaries and Person Years

		COST		
Salaries	Person Yrs	FY 83	FY 84	FY 85
GS-12 Refuge Pilot	.04	$1,940	$2,000	$2,060
GS-11 Fish & Wildlife Biologist	.04	1,550	1,600	1,650
GS-09 Wildlife Biologist	.02	580	600	620
GS-05 Biological Technician	.03	580	600	620
Biological Volunteers	.40	1,000	1,500	1,500
Subtotal	0.54	5,650	6,300	6,450
TOTAL		$13,150	$14,500	$15,850

9. Schedule:

Phase I:	October 1983-March 1984	- Monthly aerial surveys and boat surveys.
Phase II:	January 1984-March 1984	- Capture and reattach radio transmitters to bald eagles
Phase III:	January 1984-October 1984	- Monitor radio equipped bald eagles
Phase IV:	October 1984-March 1985	- Monthly aerial surveys and boat surveys (Write 1st progress report)
Phase V:	November 1984-March 1985	- Capture and attach radio transmitters to bald eagles
Phase VI:	November 1984-October 1985	- Monitor radio equipped bald eagles
Phase VII:	October 1985-March 1986	- Monthly aerial surveys and boat surveys (Write 2nd progress report)
Phase VIII:	November 1985-March 1986	- Capture and attach radio transmitters to bald eagles
Phase IX:	November 1985-September 30, 1986	- Monitor radio equipped bald eagles (Write final report)

Table 1. Bald eagles observed during aerial surveys along the Upper Kenai River, 1983-84 winter.

Month	Date	River Route Number			Total
		1[1]	2[2]	3[3]	
October	10/28/83	13	2	4	19
November	11/25/83	35	39	4	78
December	12/22/83	72	39	8	119
January	01/19/84	102	69	30	201
February	02/13/84	37	16	35	88
March	03/15/84	34	3	9	46
Total		293	168	90	551

[1]Moose River confluence to outlet of Skilak Lake.
[2]Skilak Lake Inlet to Russian River confluence.
[3]Russian River confluence to Kenai Lake.

Table 2. Ages of bald eagles observed during aerial surveys along the Upper Kenai River, 1983-84 winter.

Month	Date	River Route Number						Total	
		1		2		3			
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
October	10/28/83	4	9	2	0	4	0	10	9
November	11/25/83	25	10	20	19	4	0	49	29
December	12/22/83	44	28	30	9	6	2	80	39
January	01/19/84	66	36	26	43	14	16	106	95
February	02/13/84	26	11	8	8	22	13	56	32
March	03/15/84	23	11	3	0	6	3	32	14

Table 3. Bald eagles observed during boat surveys along the Upper Kenai River, 1983-84 winter.

Month	River Route Number			Total
	1	2	3	
October	11	3[1]	--	14
November	36	45	16	97
December	---	--	--	---
January	207	50	26	283
February	---	--	--	---
March	110	--	--	110
April	23	--	--	23

[1]Incomplete census.

Table 4. Comparison of selected boat and aerial surveys of bald eagles along the same area of the Upper Kenai River, 1983-84 winter.

Month	Aerial Survey		Boat Survey		Percent Observed During Aerial Survey
	Date	Number	Date	Number	
November	11/25/83	35	11/18/83	36	97%
January	01/19/84	102	01/19/84	207	49%
March	03/15/84	34	03/14/84	110	31%

Submitted by Robert J. Bailey Date 10/31/84

Fish and Wildlife Biologist
Kenai National Wildlife Refuge

0051E