

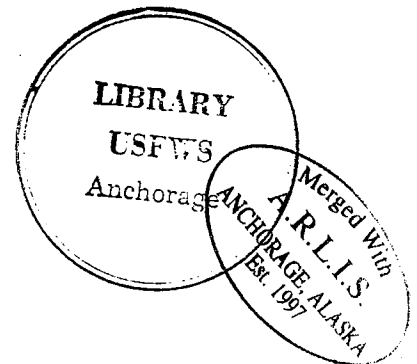
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-- RAPTOR OBSERVATIONS ASSOCIATED
WITH TERROR LAKE HYDROELECTRIC PROJECT

DENNY ZWIEFELHOFER

1983 ANNUAL PROGRESS REPORT

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U.S. FISH AND WILDLIFE SERVICE
KODIAK NATIONAL WILDLIFE REFUGE
P. O. BOX 825
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INTRODUCTION

Potential impacts on raptors by construction of the Terror Lake Hydroelectric Project (TLHP) (figure 1) were identified in a study by the Arctic Environmental Information and Data Center (AEIDC, 1980). The two species of raptors found to be most abundant and nesting in the project area were bald eagles (Haliaeetus leucocephalus) and rough-legged hawks (Buteo lagopus), which utilize different habitat within the project area.

The greatest potential for project related impacts on these species will result from construction and operation of the project's main camps and jetty on Kizhuyak Bay. Impacts on those foraging and nesting areas located along the lower portions of the Terror River and inner Terror Bay areas are expected to be minimal.

Impacts affecting rough-legged hawks should be limited to those caused by construction of the dam and access road. The loss of foraging habitat caused by inundation may cause indirect long-term detrimental effects on individuals of these species by reducing their available food supply.

The objectives of this study are:

1. Determine profound changes in reproductive rates.
2. Determine profound changes in use of feeding ranges.

The study will continue throughout project construction.

During 1983 changes were observed in both bald eagle and rough-legged hawk nest behavior. In addition changes of foraging patterns in rough-legged hawks utilizing the upper Terror River valley was also noted. These changes in habitat use are assumed to be due to increased construction activity.

I wish to thank Western Alaska Ecological Services project monitor, Hank Hoskings, for making his raptor observations available and for consolidating other project personnel's observations. Also to EBASCO employees Ed Hensley, Bill McDade, and Dennis Richardson for taking the time and effort to supply Hank with their observations.

METHODS

A U.S. Fish and Wildlife Service (USFWS) PA-18 was used to survey bald eagle nesting habitat in the Kizhuyak and Terror Bay/River areas plus the power corridor. The rough-legged hawk nest survey was accomplished by a project-leased Bell 206 helicopter and pilot. The observer for both surveys was a member of the Kodiak Refuge staff. Surveys were flown at heights of 200 to 500 feet AGL.

Nest status (active or inactive) was determined by presence or absence of an adult bird in an incubating stance on the nest.

The bald eagle nesting population survey was completed on May 25 with a follow-up productivity survey of the active nests on August 2.

The rough-legged hawk nesting survey was completed on June 10. No follow-up productivity survey was required since no active nests were located during the initial effort.

Survey sectors used were identical to those used in 1980 and 1982 (figures 2 and 4).

Observations received from project personnel were analyzed by the author. Observed behavior described in those sightings were divided into 4 categories; perched, flying/scaring, foraging, and nesting.

RESULTS AND DISCUSSION

Two raptor species, bald eagle and golden eagle, were found nesting within the TLHP area during the 1983 survey period. A total of 17 bald eagle nests and 1 golden eagle nest was located within the study area. Eleven eaglets were fledged from seven active bald eagle nests with the single golden eagle nest failing to fledge any young. No rough-legged hawk nesting activity was discovered, even though this species nested within the project area in 1980 and 1982. A summary of survey results from 1980, 1982 and 1983 is contained in Table 1. The following narrative describes the results of the 1983 surveys by survey sector:

Survey Sector No. 1

Kizhuyak River, Kizhuyak Inner Bay, Powerline Routes, Buskin Lake

Fifteen bald eagle nests and one golden eagle nest were found in this survey sector (figure 2). Six of the fifteen bald eagle nests were active producing a total of ten eaglets. Four of the active nests produced two fledglings each with the remaining two nests fledging one young each. In 1982 a total of 11 nests were found in this sector (figure 3) with 7 active nests fledging a total of eleven bald eaglets.

A pair of golden eagles rejuvenated an inactive rough-legged hawk nest site near Rolling Rock Creek hatching a single young. The downy eaglet was observed in the nest from June 10 to June 24. A period of inclement weather occurred on June 25 to June 29. The young golden eagle was not observed in the nest after that time. The adult golden eagles were not seen in the area again until mid-September. The Rolling Rock Creek Diversion structure is approximately one-third mile from the nest location. It is not known whether the construction activity had any effect on the success of the golden eagle nest. Exposure to adverse weather conditions is a more probable cause for the nest failure, however.

Concomitant with the construction of the Kodiak and the Port Lions transmission lines of the TLHP a modification of nesting behavior in as many as three pairs of bald eagles was observed. Two of the three pairs constructed new nest platforms with the remaining pair rehabilitating an old nest platform within their respective territories.

Right-of-way (ROW) surveying and clearing activity around Buskin Lake during the critical bald eagle courtship period (late March - early April) is likely responsible for the new nest construction by the Buskin Lake bald eagles. Low level helicopter flights associated with work crew movement also is assumed to have been a factor.

Because of increased disturbance during 1982, it had been projected that the pair of bald eagles near the Kizhuyak Bay jetty would attempt to avoid the disturbance in this area and modify their nesting behavior (1982 progress report). Field camps had been located near this nest in 1979 and 1980 plus the initial construction staging camp in 1982. The bald eagles using the nest in previous years had already begun nesting before activity associated with the camps commenced. The construction of the new nest platform approximately 1/2 mile from the jetty during 1983 is assumed to be due to the activity in the jetty area during the courtship and early nesting period.

A bald eagle nest platform located adjacent to the Port Lions transmission line ROW along Barabara Creek was destroyed by wind. An old nest platform approximately 1/4 mile from the destroyed platform was consequently rejuvenated and utilized during 1983. The destroyed nest had last been active in 1980. It could not be discerned if ROW clearing had made the nest more susceptible to wind damage.

Even though changes in nesting behavior were observed, individual nest productivity was not affected as each of the three nests fledged two eaglets.

The anticipated use of the Port Lions transmission line ROW by off-road vehicles may result in nesting behavior modification of bald eagles adjacent to the ROW in the future. The right-of-way is most likely to be used by ORV's during the late spring and early summer when vegetation is minimal. Nesting bald eagles are sensitive to disturbance throughout the breeding season but are particularly sensitive in the early stages of courtship, nest selection, and egg laying. Since the Port Lions transmission line was not part of the original Terror Lake Hydro-electric Project, the consequences of the addition of the transmission line were not identified in the project environmental impact statement nor were they mitigated for. The extent and timing of usage of the right-of-way will determine the long term effects its presence will have on bald eagles nesting along the westside of Kizhuyak Bay.

Survey Sector No. 2
Terror River, Inner Terror Bay

Only one pair of bald eagles was found nesting in this sector in 1983. No other nesting raptors were located in sector 2 this year. One active and one inactive bald eagle nest platform were located during the survey flight (figure 4). A single eaglet was fledged from the active nest. In 1982, this survey sector had two active bald eagle nests producing 2 eaglets each (figure 5).

Survey Sector No. 3
Terror Lake Basin

A comprehensive survey of known rough-legged hawk nesting habitat in the project area located no nests or adult birds. The Terror Lake basin contained three active rough-legged hawk nests which fledged a total of six young in 1980 and one active nest producing 2 young in 1982.

Intensive construction activity around the lake area during 1983 displaced rough-legged hawks from historic nesting areas to less desirable locations. It is suspected lateral tributary canyons along the Terror River several miles below the dam site were utilized by rough-legged hawks during the 1983 nesting season but this was not verified.

An area near the upper construction camp on the southwest corner of Terror Lake was examined for tundra vole numbers. Tundra voles are considered to be the primary food source available to foraging rough-legged hawks on Kodiak Island. Three sample plots revealed 1983 tundra vole populations to be at or near 1982 levels. The plots are in an area where rough-legged hawk foraging activity was observed in the past and had been examined in 1982.

The diminished use of the Terror Lake basin and upper Terror river valley by nesting rough-legged hawks is therefore apparently not related to food availability in the survey sector during 1983.

RAPTOR OBSERVATIONS

A total of 291 individual raptors of six different species was reported in the 122 observations made by project personnel during the period March 19 to October 20. Bald eagles were the most frequently observed raptor, constituting nearly half of all observations. Although rough-legged hawks did not nest in the project area in 1983, this species made up approximately a third of all observations. The rank by frequency of observation in the remaining four raptor species was golden eagle, Peale's peregrine falcon, merlin, and northern goshawk. A summary of all observation information is contained in Table 2. All observations were made within the primary project area. No observations were recorded in the lower Terror River/Terror Bay area.

SUMMARY

Modifications to both bald eagle and rough-legged hawk nesting behavior were seen in the Terror Lake Hydroelectric Project area during 1983. A decreased usage of the upper Terror River valley by foraging rough-legged hawks was also noted. The changes which were observed are apparently caused by increased activity associated with project construction. These behavior modifications are hopefully not permanent and a return to historic patterns are expected as construction activities wind down.

Levels of funding in 1984 are projected to remain the same as 1982 and 1983.

LITERATURE CITED

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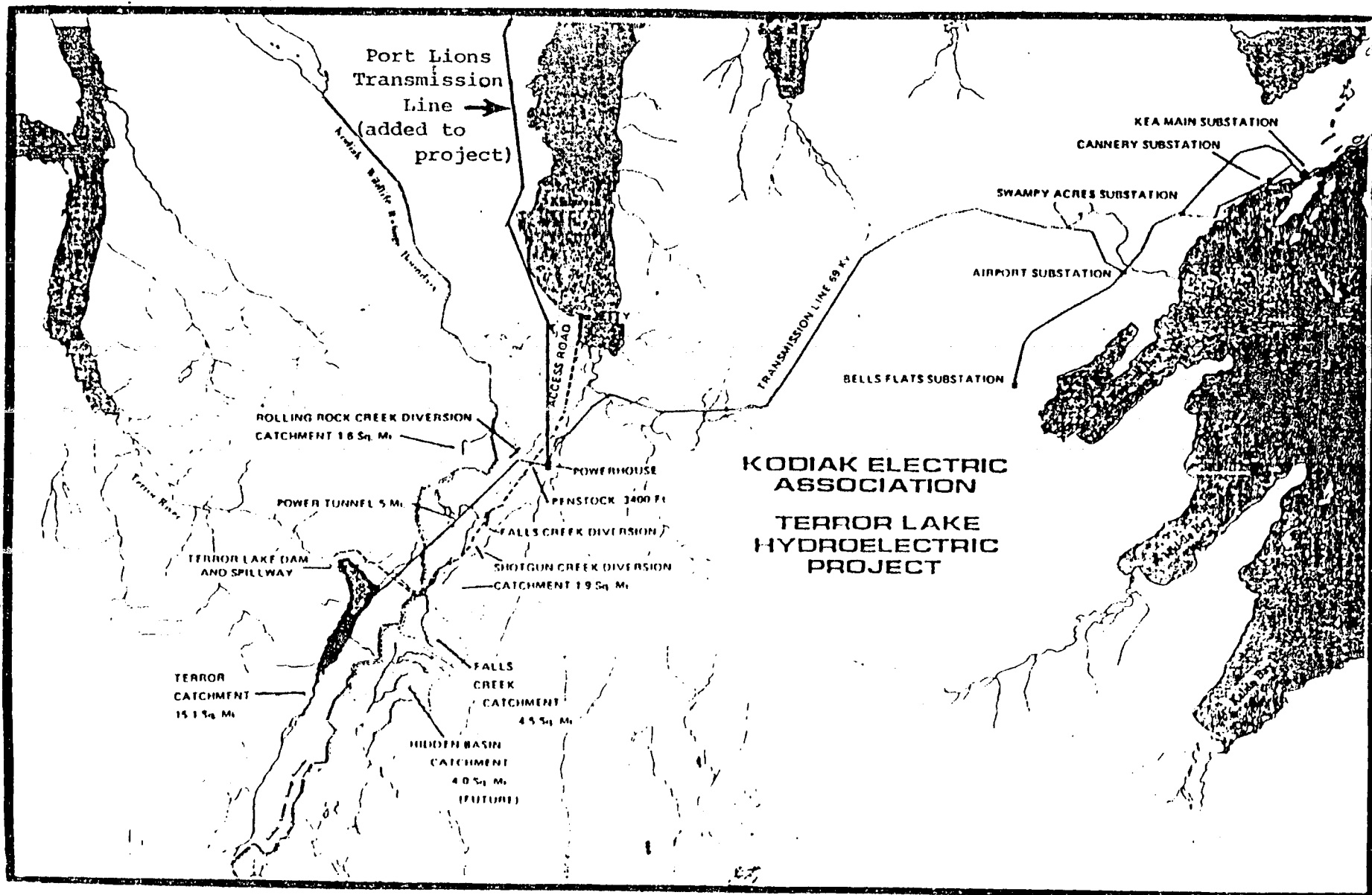


Figure 1

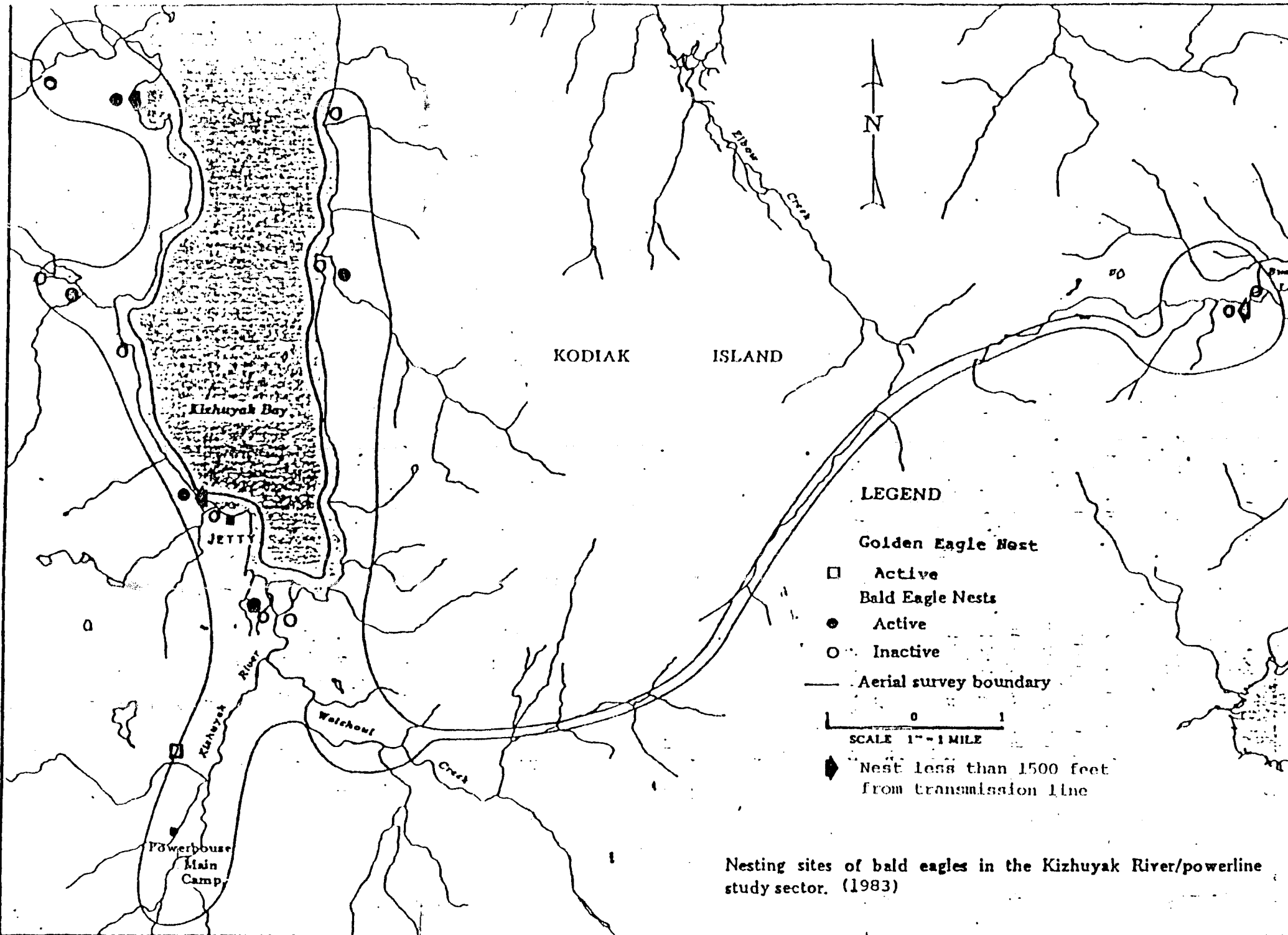
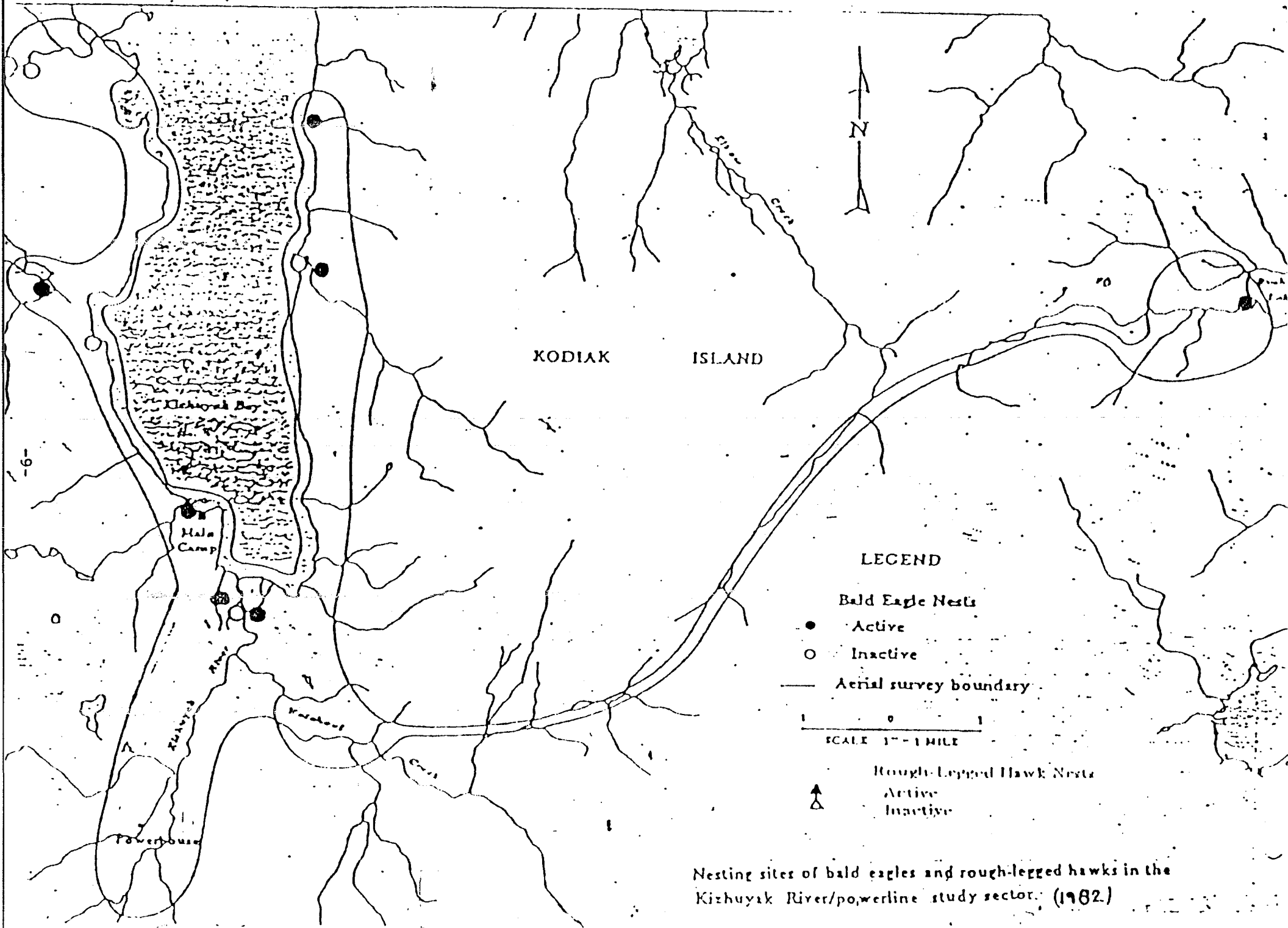


Figure 2



Nesting sites of bald eagles and rough-legged hawks in the Kizhuyak River/powerline study sector. (1982.)

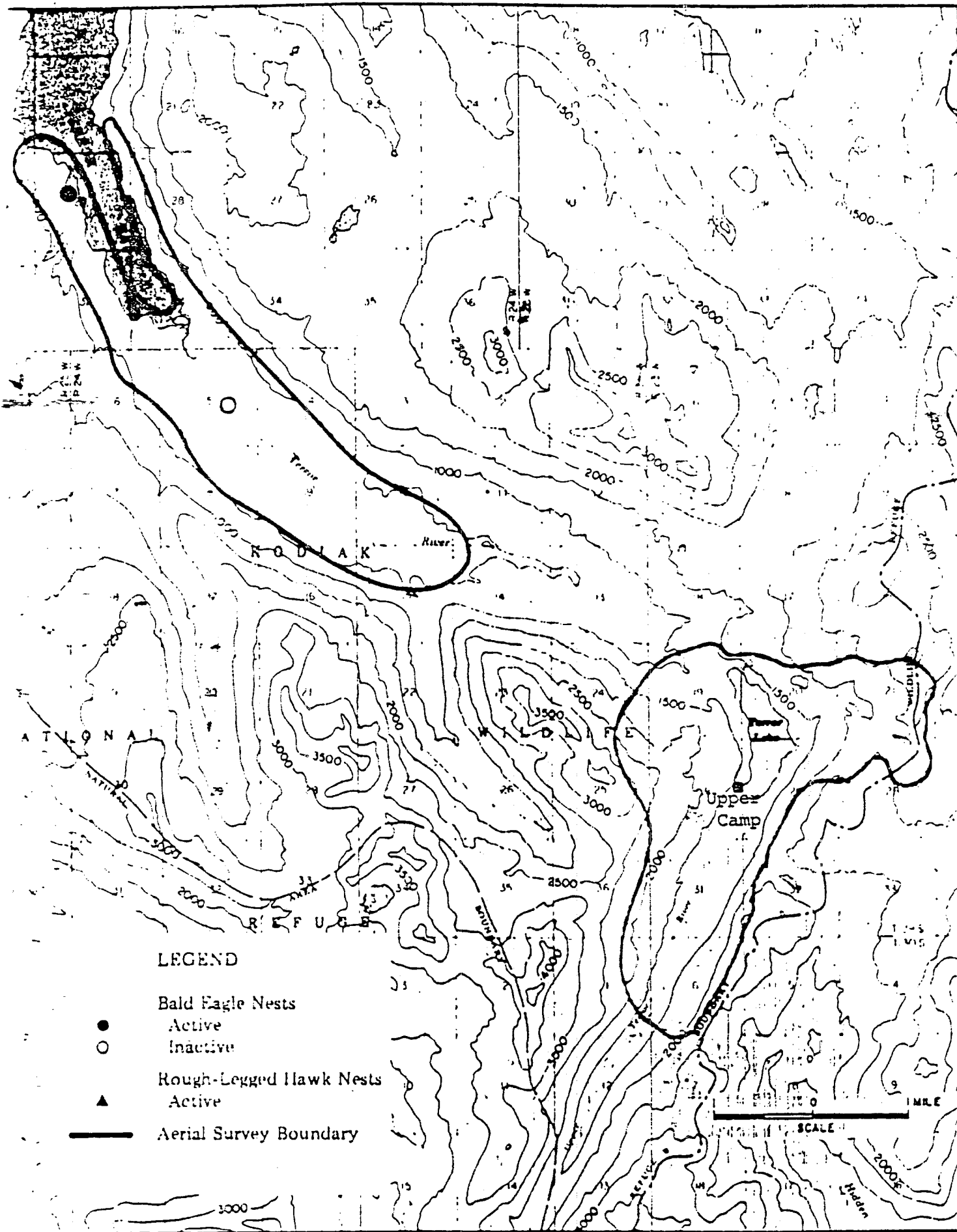


Figure 4. Nesting sites of bald eagles and rough-legged hawks in the Terror River and Terror Lake basin study sectors. (1983)

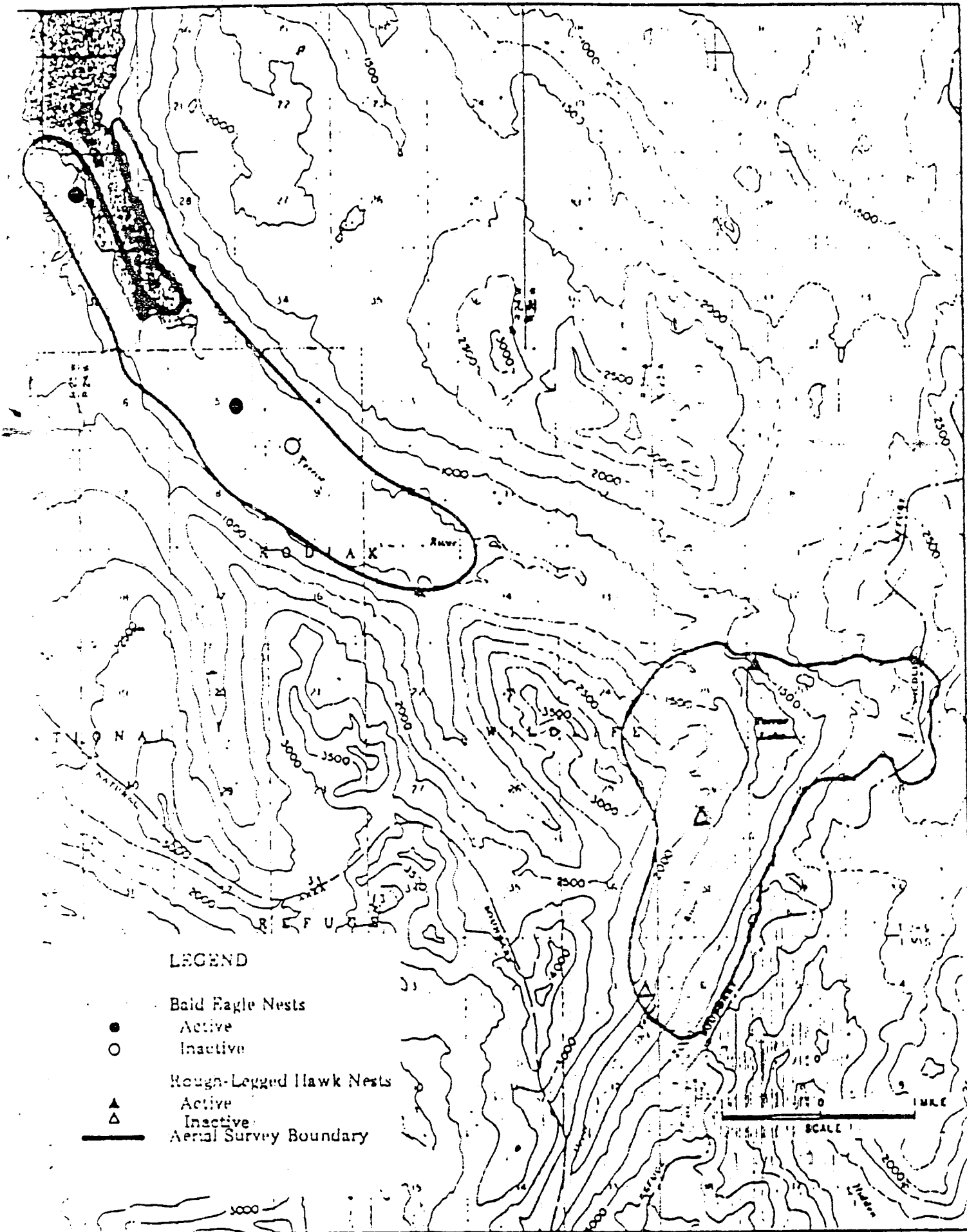


Figure 5 . Nesting sites of bald eagles and rough-legged hawks in the Terror River and Terror Lake basin study sectors. (1982)

TABLE NO. 2

TERROR LAKE HYDROELECTRIC PROJECT

RAPTOR OBSERVATIONS

| <u>Species</u> | <u>Total No. Observed</u> | <u>Total No. of Observations</u> | <u>Perching</u> | <u>Observation Activity</u> | | <u>Nesting</u> |
|-----------------------|-------------------------------|--------------------------------------|-----------------|-----------------------------|-----------------|----------------|
| | | | | <u>Flying/Soaring</u> | <u>Foraging</u> | |
| Bald Eagle | 212 | 57 (47%) | 8 (14%) | 25 (44%) | 18 (32%) | 6 (11%) |
| Rough-legged Hawks | 43 | 38 (31%) | 2 (5%) | 17 (45%) | 19 (50%) | 0 (0%) |
| Golden Eagle | 23 | 14 (11%) | 1 (7%) | 3 (21%) | 5 (36%) | 5 (36%) |
| Peale's Peregrine | 8 | 8 (7%) | 2 (25%) | 3 (37.5%) | 3 (37.5%) | 0 (0%) |
| Merlin | 3 | 3 (3%) | 2 (66%) | 0 (0%) | 1 (33%) | 0 (0%) |
| Northern Goshawk | 2 | 2 (2%) | 0 (6%) | 1 (50%) | 1 (50%) | 0 (0%) |

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TABLE NO. 1

TERROR LAKE PROJECT RAPTOR NESTING SURVEY

SUMMARY 1980, 1982 AND 1983

| Species ¹ | Year | Survey Sector | No. Active Nests | No. Inactive Nests | No. of Nests Fledging The Following No. of Young | | | | No. Young/ Active Nests |
|----------------------|-------------------|---------------|------------------|--------------------|--|---|---|---|----------------------------|
| | | | | | 0 | 1 | 2 | 3 | |
| Bald Eagle | 1980 ² | 1 | 6 | 6 | 6 | 0 | 6 | 0 | 2.0 |
| Bald Eagle | 1982 | 1 | 7 | 4 | 4 | 3 | 4 | 0 | 1.6 |
| Bald Eagle | 1983 | 1 | 6 | 9 | 9 | 2 | 4 | 0 | 1.7 |
| Rough-legged Hawk | 1982 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Golden Eagle | 1983 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bald Eagle | 1980 ² | 2 | 2 | 1 | 3 | 0 | 0 | 0 | 0 |
| Bald Eagle | 1982 | 2 | 2 | 1 | 1 | 0 | 2 | 0 | 2.0 |
| Bald Eagle | 1983 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 1.0 |
| Rough-legged Hawk | 1980 ² | 3 | 3 | 0 | 0 | 0 | 3 | 0 | 2.0 |
| Rough-legged Hawk | 1982 | 3 | 1 | 2 | 2 | 0 | 1 | 0 | 2.0 |
| Rough-legged Hawk | 1983 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

¹Species not listed in each year or sector were not present in the survey sector during that year.

²1980 Data from AEIDC, 1980, An Assessment of Environmental Effects of Construction and Operation of Proposed Terror Lake Hydroelectric Facility.