

**Glen Canyon National Recreation Area
Eagle Survey Report:
Winter 1996-1997**

23 October 1997

Nikolle L. Brown

National Park Service
Glen Canyon National Recreation Area
Resource Management Division
P.O. Box 1507
Page, AZ 86040

INTRODUCTION

The Bald Eagle (*Haliaeetus leucocephalus*) is a migratory species that can be found wintering in Glen Canyon National Recreation Area (NRA). Historically, their distribution was nationwide; however, populations of bald eagles outside of Alaska have declined because of habitat loss and reproductive failure due to pesticides and heavy metals in their diets. In combination with the protection of this species through the Bald Eagle Act of 1940 and federal listing as *Endangered* under the Endangered Species Act of 1973, recent restrictions placed on certain pesticides have allowed for the comeback of this species in some of its historic range. Because of the overall increase in the numbers, which have met the recovery goals set by the U. S. Fish and Wildlife Service (USFWS), the bald eagle was reclassified from endangered to threatened in 1995. Threatened species are defined as any species that is likely to become an endangered species within the foreseeable future throughout all or a significant part of its range (USFWS 1995). Industrial development, logging, recreational development, and other human disturbances have caused eagles to abandon nests and remain potential threats of this species.

Wintering bald eagles are opportunistic feeders and will concentrate in areas where prey availability is high and energy expenditure to capture prey is low (Stahlmaster 1987). High numbers of migratory waterfowl around and the abundance of fish in Lake Powell and the Colorado River in the winter months make for ideal winter foraging grounds for bald eagles. Winter surveys for bald eagles around Glen Canyon NRA have been conducted since 1983. These surveys usually consisted of one-day aerial surveys or boat surveys conducted monthly from November through March. In 1990-91, the aerial surveys were conducted bi-weekly and initiated the inclusion of golden eagles (*Aquila chrysaetos*) into the survey efforts. In 1991-92, boat surveys were conducted in addition to the monthly aerial surveys. Due to budget constraints and the less concern for the species, only two aerial surveys were conducted in the winter 1996-97 on 10 January 1997 and 3 February 1997. Of these, the January survey was conducted as a part of Arizona Game and Fish's state-wide bald eagle survey.

METHODS

In 1997, the two aerial surveys were conducted in the NRA using the National Park Service's Cessna 206 fixed-wing aircraft. The area covered in each of the surveys consisted of the stretch of the Colorado River from Lee's Ferry to the Glen Canyon Dam and Lake Powell and its tributaries from the dam to Cataract Canyon (Figure 1.). Flight altitude ranged from 30 m (100 ft) to 120 m (400 ft) with air speeds averaging 90-100 mph. The survey crew consisted of a pilot and two observers, with the observers positioned on opposite sides of the aircraft. Data sheets were used to record bald and golden eagle sightings, general locations (using canyon or map name as a reference), age (if identifiable), and activities (such as perched, flying, or foraging). Other raptors and avifauna were

recorded on separate data sheets (see Appendix A for examples of each data sheet).

RESULTS

The locations of bald and golden eagles as observed in 1997 are listed in Table 1. Observations are grouped by month and approximate locations are noted using the nearest canyon or significant landmark. The February survey resulted in a larger number of bald eagles observed (16) than the January survey (7), and the number of golden eagles seen was the same for both months (3). Table 2 shows the total number of eagles seen for the January survey period from 1990 to 1997.

The only other raptors observed during these surveys included one peregrine falcon (*Falco peregrinus*; in February) and two red-tailed hawks, (*Buteo jamaicensis*; one in January and one in February).

DISCUSSION

The numbers of eagles observed varies with the time of month the surveys were conducted, between years and within the same year. This was apparent in the 1991 data where three surveys (bi-weekly) were conducted in January with the highest number of sightings occurring on the 28th versus the 7th and 17th.

Weather and other environmental conditions are factors that can effect both the reproductive success and the time and route of migration for many species, including eagles. The fluctuations in numbers of the winter populations as shown in comparing the surveys from year to year (*i.e.* Table 2), can be caused by such factors. Had the February 1997 survey not been conducted, the January data would have assumed a major decrease in the numbers of bald eagles wintering in Glen Canyon NRA (36%; based on a one-day survey effort). It is recommended to survey for eagles at least two, preferably three times, during the winter months; this would allow for the collection of seasonal data and still allow for some long-term comparisons (year-to-year).

Golden eagles are known to be year-round residents of Glen Canyon NRA. Although only a few were seen on the winter aerial surveys, several were seen throughout the spring and summer months of 1997. So apparently based on continuous incidental observations in the NRA, this species is relatively stable in this area and weather may have been a factor in the lower numbers than previous years. It is thought that a lower than normal amount of rainfall in 1996 had resulted in a noticeable decrease in the rodent abundance (*e.g.* rabbits and hares) and in the eagle populations, particularly the golden eagles (B. Russell, pers. com.).

CONCLUSION

The aerial method of surveying eagles is useful in documenting the winter populations of both bald and golden eagles in the Glen Canyon NRA. This method covers a larger area than what can be covered efficiently by boat. Because a single survey conducted one day a year is not very effective in monitoring trends in numbers year-to-year, it is recommended that at least three aerial surveys are conducted each year. Based on the "typical" migration dates, surveys conducted in December, January, and February would provide a more reliable dataset, allowing for some seasonal and annual differences. It would also be more consistent if the surveys could be conducted around the same dates from year-to-year, this could allow for a more reliable comparison of the annual data. Conducting two or more surveys annually around the same dates could provide better data to determine long-term trends in the eagle populations in Glen Canyon NRA.

ACKNOWLEDGMENTS

Credit is due to Brenda Russell for arranging the surveys and collecting and compiling the 1997 data and for reviewing this report. Chris Goetze and Rich Rooney assisted in the collection of the data and Tug Kangus was the pilot of the aircraft for both surveys.

REFERENCES

Connella, C. 1995. Eagle Survey: Glen Canyon National Recreation Area. National Park Service, Page, Az. Unpublished report. 12 pp.

Daw, S. K. 1991. Eagle Survey: Glen Canyon National Recreation Area. National Park Service, Page, Az. Unpublished report. 13 pp.

Hetzler, B. C. 1992. Eagle Survey: Glen Canyon National Recreation Area. National Park Service, Page, Az. Unpublished report. 10 pp.

Pinnock, C. 1993. Eagle Survey: Glen Canyon National Recreation Area. National Park Service, Page, Az. Unpublished report. 7 pp.

Stahlmaster, M. V. 1987. The Bald Eagle. Universe Books, N.Y. 227 pp.

United States Fish and Wildlife Service. 1995. Endangered and threatened wildlife and plants; Final rule to reclassify the bald eagle from endangered to threatened in all of the lower 48 states. Federal Register, vol. 60(133): 36000-36010.

TABLE 1. Locations of bald and golden eagle sightings throughout Glen Canyon National Recreation Area during January and February 1997.

January

Bullfrog Bay	Bald Eagle	Adult	1
The Horn	Bald Eagle	Adult	1
Good Hope Bay	Bald Eagle	Adult	2
Hite	Bald Eagle	Adult	1

Cataract Canyon	Bald Eagle	Adult	2
Hite	Golden Eagle	Adult	1
Halls Crossing	Golden Eagle	Adult	2

February

Colorado River-Mile 2	Bald Eagle	Immature	1
Lone Rock Point	Bald Eagle	Adult	1
Piute Farms	Bald Eagle	Immature	1
Bullfrog Bay	Bald Eagle	Adult	1
Back of Halls Creek Bay	Bald Eagle	Immature	1
Halls Creek Bay-W. side	Bald Eagle	Adult	1
" " middle of bay	Bald Eagle	Adult	1
Annie's Canyon	Bald Eagle	Adult	1
The Narrows	Bald Eagle	Immature	1
Good Hope Bay	Bald Eagle	Adult	1
Warm Creek Bay	Bald Eagle	Immature	1
San Juan	Bald Eagle	Adult	1
Hite	Bald Eagle	Adult	1
Hite--S. of marina	Bald Eagle	Adult	1
Bullfrog Bay--W. side	Bald Eagle	Adult	1
West Canyon	Bald Eagle	Adult	1
Dam/Antelope Island	Golden Eagle	Adult	1
Bullfrog Bay- E. side	Golden Eagle	Adult	1
Cookie Jar	Golden Eagle	Adult	1

TABLE 2. Total number of eagles observed in January in Glen Canyon National Recreation Area from the '90-91 survey period to '96-97.

Year	91	92	93	94	95	96	97
Date	28	09	28	12	31	25	10
Bald Eagle	19	20	20	15	21	11	7
Golden Eagle	7	11	0	6	9	9	3

APPENDIX A

Examples of the data sheets

