

Raptor Banding at Point Diablo Supplies Trapping Success Data

By Judd A. Howell and Williston Shor

Point Diablo hawk lookout was described by Binford (1979) as a major site for west coast raptor observation. During the fall of 1983 the National Park Service supported a program for trapping and banding migrating diurnal raptors in the Marin Headlands District of Golden Gate National Recreation Area. In 29 partial days during 1983, 41 individuals of 4 raptor species were captured, banded and released. Trap success was about 35 percent for hawks attracted by lure. In 110 days during 1984, 207 individuals of 6 raptor species were captured.

Introduction

In 1973 fifteen hawk migration observatories existed in the continental United States (HMANA 1974). The sixteenth was located in Ontario, Canada. All the observatories were east of the Mississippi River. Hawks observed in migration numbered in the thousands, varying from approximately 2,000 to 500,000 per station. Several stations were active in capturing and banding migrating hawks, including Cape May, N.J., Hawk Ridge, Minn., and Whitefish Point, Mich. Thiollay (1980) reported 262,000 hawks during spring migration along the east coast of Mexico.

The first reports from the west coast at Point Diablo, Calif. (De Sante and Remsen 1973) described briefly Binford's (1979) 29 days of observation, recording 4034 individuals of 14 species. Eighteen species of diurnal raptors were recorded from 1972 to 1977 including one endangered species, the peregrine falcon. Unusual sightings from Point Diablo were reported in subsequent years such as the wing marked Swainson's hawk from Richland, Wash. (Stallcup, DeSante and Greenberg 1975, Stallcup and Winter 1976, and Winter and Erickson 1977). After Binford's (1979) report no systematic counts were conducted at Point Diablo, Calif., until 1982 (Evans, Erickson and Le Valley 1982 and Faust pers. comm.).

Raptor banding activities along coastal California have been limited primarily to local population studies. Bloom (pers. comm.) reported tentative patterns of migration based on his banding efforts during the 1970s and early 1980s. Red-tailed hawks banded in southwestern California dispersed northward while red-tailed hawks banded in northeastern California moved south. Two American kestrels flew from eastern and southeastern California to west central and southwestern Mexico. Bloom also reported that two peregrine falcons moved from northwestern California to northwestern Mexico, and one peregrine flew to the Napa Valley north of San Francisco Bay. Other raptor observatories and a single banding station began in Montana, Utah and Nevada, respectively, during the early 1980s (Tilly 1981, Hoffman 1984, and

Hoffman and Potts 1984).

Little is known about the origin or destination of the raptors that use the Point Diablo flyway. The importance of establishing a banding station there was recognized by the National Park Service and received public review and support (Howell 1982). The main goal of the banding station is to establish primary data on dispersal and migration routes of diurnal raptors along coastal California. Secondary goals include, but are not limited to, environmental education and interpretation, natural resource protection, and evaluation of human impacts.

Methods

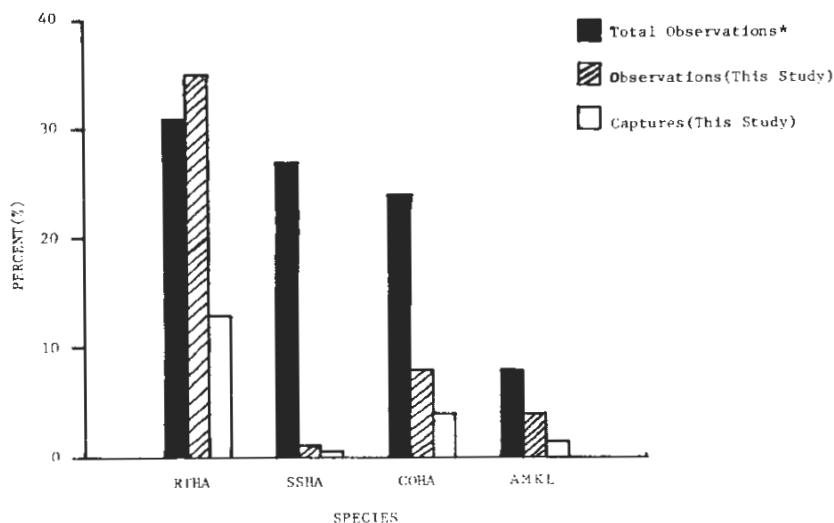
Point Diablo is located at the southern tip of the Marin peninsula, Marin County, Calif. The peninsula is bounded on the east by San Francisco and San Pablo Bays, on the west by the Pacific Ocean and on the south by the Golden Gate, a one mile wide channel that connects San Francisco Bay with the Pacific Ocean. The coastal mountains of California run parallel with the shore. Onshore breezes along the coastal

ridges form updrafts, which are used by migrating raptors as they move south in the fall. The Marin peninsula forms a large funnel that guides migrating birds to its tip, where they concentrate. In this area, the Marin Headlands, they tend to stop before crossing the water barrier of the Golden Gate.

In late September 1983 two banders began trapping diurnal raptors at Point Diablo (Battery 129 or Hawk Hill) in the Marin Headlands. Battery 129 is a popular vista point as well as raptor observatory. Because of visitor interference, the banding effort was moved to Cross Hill (Slacker Hill) 1.2 km northeast of Battery 129. Trapping for 1983 was conducted from Sept. 24, 1983, to Jan. 2, 1984. Raptors were captured, measured, weighed, sexed when possible, banded with serially numbered leg bands and released.

Trapping was conducted 2 to 4 days each week for 3 to 6 hours per day. Three trap types were used in various combinations: a) 1 to 3 dho-gazza traps, b) 2 to 4 bal-chatri traps and c) 1 bow net. A lure bird, attached with flying harness and line to a pole and controlled from blinds up the hill, was used to attract

Figure 1. Relative Frequencies of Four Raptor Species Observed* and Captured in 1983 at Pt. Diablo Hawk Lookout, Golden Gate National Recreation Area, California.



*Data courtesy of Carter Faust, Marin Audubon Society

raptors. When raptors approached, the lure bird was allowed to escape into a shelter. A pocket tape recorder was used to record species, observations, behavior, weather and captures.

Nine volunteers contributed 319 hours of work during 1983, building blinds, and animal cages, trapping, and banding. NPS field staff and maintenance personnel contributed additional time, materials, and support.

Trapping for 1984 was conducted from Sept. 4 to Dec. 31, 1984. Forty-nine volunteers operated the station, 7 days a week, except during inclement weather, when they trapped along the road using bal-chatri. The major change in trapping methodology for 1984 was to rely almost exclusively on 2-bow nets. The volunteer raptor banding program for 1984 was designed to provide a full time banding station during the fall migration at Cross Hill (Slacker Hill).

Sixty-five volunteers, age 18 or older, were recruited from local universities and conservation groups. They were trained, in cooperation with the San Francisco Zoological Society's Raptor Conservation Program, in five, 3-hour sessions covering raptor identification, biology of migration, Federal and State laws, capture and handling techniques, banding, NPS policy and volunteer etiquette. In addition, each volunteer spent a day in the field to become familiar with the site. In mid-June 1984, each volunteer who had successfully completed the course was certified with a banding station sub-permit.

Results

In 29 days, totaling 129 hours of trapping during 1983, 41 individuals of 4 raptor species were captured: Red-tailed hawk (RTHA) *Buteo jamaicensis*, Cooper's hawk (COHA) *Accipiter cooperii*, Sharp-shinned hawk (SSHA) *Accipiter striatus* and American kestrel (AMKE) *Falco sparverius*. Four additional species were observed in 1983 but not captured: Northern harrier (NOHA) *Circus cyaneus*, merlin (MEL) *Falco columbarius*, Golden eagle (GOEA) *Aquila chrysaetos* and Black-shouldered kite (BSKI) *Elanus caeruleus*.

In 110 days, totaling over 700 hours trapping during 1984, 207 individuals of 6 raptor species were captured: 158 Red-tailed hawks, 33 Cooper's hawks, 2 Sharp-shinned hawks, 9 American kestrels, 4 Northern harriers and 1 goshawk *Accipiter gentilis*. In 1984 four additional species were attracted to the traps: prairie falcon, *Falco mexicanus*, peregrine falcon *Falco peregrinus*, Red-shouldered hawk, *Buteo lineatus* and Broad-winged hawk, *Buteo platypterus*.

Table 1 presents the total 1983 observations of each species, the number attracted to the bait, and number captured. These data are approximate because complete records were not kept for all days. In addition these initial data were used to evaluate trapping success and should not be used to establish trends. Of 114 individuals attracted to the trapping area in 1983, 35 percent were captured.

A total of 268 trap hours was accumulated in 1983. Table 2 presents the capture rates for each trap type. The bal-chatri traps were used in two locations, on Cross Hill and in Rodeo Valley along the road. The dho-gazzas and bow net were used only on Cross Hill.

Carter Faust (pers. comm.) observed 3,249 raptors in 65 days of observations at Battery 129 during 1983 and saw 10,551 raptors in over 100 days of observation during 1984. Fig. 1 presents the relative frequencies of the 4 species that were captured in 1983 during this study, compared with the relative frequencies of Faust's 1983 observations. The frequency distribution for 1984 is very similar to Fig. 1, illustrating an under-representation of accipiters in the sample. Our first band recovery for the 1983 trapping season came from a Cooper's hawk banded in September 1983 and shot near Mexicali, Mexico Jan. 14, 1984.

The 1984 volunteers logged 1,160 hours of training, 480 hours of site establishment and 2054.5 hours of banding. This amounts to approximately 1.8 work years or \$27,778.

Discussion

In general, for the first year a 35 percent trap success seemed good, although proportionately fewer

Sharp-shinned and Cooper's hawks were attracted and captured both in 1983 and 1984. The bow net was the most efficient trap while dho-gazzas produced moderate results.

Three major changes in methodology need to be implemented for future trapping. First, trapping for Cooper's and Sharp-shinned hawks will be conducted along the riparian corridor in Rodeo Valley where they tend to hunt in the willow thickets. Nets will be used with a lure bird and willows as background. Second, trapping for American kestrels will be done systematically along roads. Bal-chatri traps will be used with mice as lures. Third, an additional trapping site will be established west of Battery 129 to capture species not seen on Cross Hill.

The feasibility study in 1983 and more intensive trapping of migrating raptors at Point Diablo in 1984 were successful (Howell and Shor 1984). With planned changes in methods and increased trapping efforts by volunteers, future seasons should produce numbers of bandings that will lead to meaningful recovery results. As the program grows and becomes more successful an effort will be made to use biotelemetry to maximize results.

Howell is a Natural Resource Specialist at Golden Gate NRA. Shor is a VIP (Volunteer in Park) working in the banding program.

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Table 1. Approximate numbers of raptors observed, attracted and captured in 1983 at Point Diablo Hawk Lookout, Golden Gate National Recreation Area, Calif.

	Number of Sightings	Number of Attractions to Bait	Number of Captures	Capture/Attraction (%)
RTHA	142	76	29	38
COHA	26	18	8	44
SSHA	7	2	1	50
AMKE	18	8	3	37
NOHA	14	7	0	0
MERL	2	2	0	0
GOEA	2	1	0	0
BSKI	1	0	0	0
TOTAL	212	114	41	35

Table 2. Capture rates of four hawk capture techniques at Point Diablo Hawk Lookout, Golden Gate National Recreation Area, Calif.

Capture Technique	Net Hours	Captures	Captures/Hr.
Dho-gazza	140	15	0.11
Bal-chatri (fixed)	60	0	0.00
Bal chatri (road trapping)	10	3	0.33
Bow net	58	23	0.40