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BALD EAGLE NESTING STUDIES IN SEYMOUR CANAL, SOUTHEAST ALASKA

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ABSTRACT.—Bald Eagle (*Haliaeetus leucocephalus*) productivity surveys were conducted annually from 1972 through 1981 in Seymour Canal, southeast Alaska. The 90 km of coastline supported approximately 90 nests. During late June, the 29% productive nests contained 1.56 eggs or downy young per nest. Productivity dropped to 19% in 1979 and 1980 and 23% in 1981. Nest loss due to natural causes averaged 5% per year.

The Seymour Canal Eagle Management Area was established within the Tongass National Forest of southeast Alaska in 1972 because it had an unusually high density of nesting Bald Eagles (*Haliaeetus leucocephalus*) in an undisturbed habitat. The area contains three major islands and several small islets which have 90 km of saltwater shoreline. The islands are situated at the head of a large inlet on the east side of Admiralty Island with a southeastern exposure. The shoreline habitat is typical old-growth coastal forest of Sitka spruce (*Picea sitchensis*) and western hemlock (*Tsuga heterophylla*).

I know of no long-term studies of nesting Bald Eagles in southeast Alaska, but previous productivity studies include a one-year sample of nests on Admiralty Island (Robards and King 1966) and a three-year study near Petersburg (Corr 1974). Breeding population surveys were conducted in 1967 (King et al. 1972) and 1977 (Hodges et al. 1979). Other areas of study in Alaska include Kodiak Island (Troyer and Hensel 1965), Amchitka Island (Sherrod et al. 1976 and White et al. 1971) and the Alaska Peninsula (Hehnke 1973).

I report here the results of nest productivity surveys at Seymour Canal conducted annually from 1972 through 1981 (Fig. 1). The objectives of this study were to: (1) obtain baseline productivity data in an undisturbed habitat over a long period of time and (2) provide information for management decisions.

METHODS

F. C. Robards conducted the initial nest survey by boat in 1972 to locate nests and mark nest trees. Subsequent surveys by boat were used in 1973, 1977 and 1980 to verify loss of old nests and attempt to locate new ones. The nests were usually situated in the upper crown of a dominant or codominant tree near the shoreline. They were classified as active if the adults were on the nest or behaved defensively.

Productivity surveys were conducted from helicopter. Each nest was examined closely for the presence of eggs or young. "Active" nests contained eggs or young. Sometimes a low aerial pass was necessary to flush an adult from the nest to see the contents of the nest. Aggressive eagles were encountered at roughly one out of every 15 nests. These eagles flew at the helicopter with no apparent intent to veer off. The safest practice was to stay above the offensive eagles. Flight time was 3.5 h per survey.

Helicopter surveys during the downy young stage appeared to have little effect on the young and apparently no lasting effect on the adults, since productivity increased through the first seven years of the study. Helicopter surveys are not advisable during the incubation period, however, because of the risk of eggs being destroyed by a disturbed adult. Also, after the young are fully feathered, disturbance may cause premature fledging.

RESULTS

Helicopter surveys were usually conducted during the last two weeks of June when incubation was nearly complete and 92% of the nests contained downy young and 8% contained eggs (Table 1). The frequency distribution of nests with eggs or young was 43% with one egg or young, 55% with two eggs or young, and 1.3% with three eggs or young. The ratio of active nests to total nests dropped during the last three years of the study (Table 2). The mean rate was 29%, or about one active nest for every 3.2 km of coastline.

Annual nest surveys by boat in other parts of southeast Alaska by the U.S. Fish and Wildlife Service since 1972 have provided comparable nest activity data. The total average activity rate was 47% from 1972 to 1978 and it also declined in 1979, 1980 and 1981 to record lows of 30%, 20% and 28%, respectively.

I collected few survival data. A survey of 10 active nests in Seymour Canal indicated a 0.81 survival rate for eggs and young from 8 June to 21 June 1972. The 17 active nests in 1979 showed a survival rate of 0.70 from 21 June to 6 August. Combining the two years gives an estimated survival rate from 8 June to 6 August of 0.57.

A 5% annual rate of nest loss occurred during the study

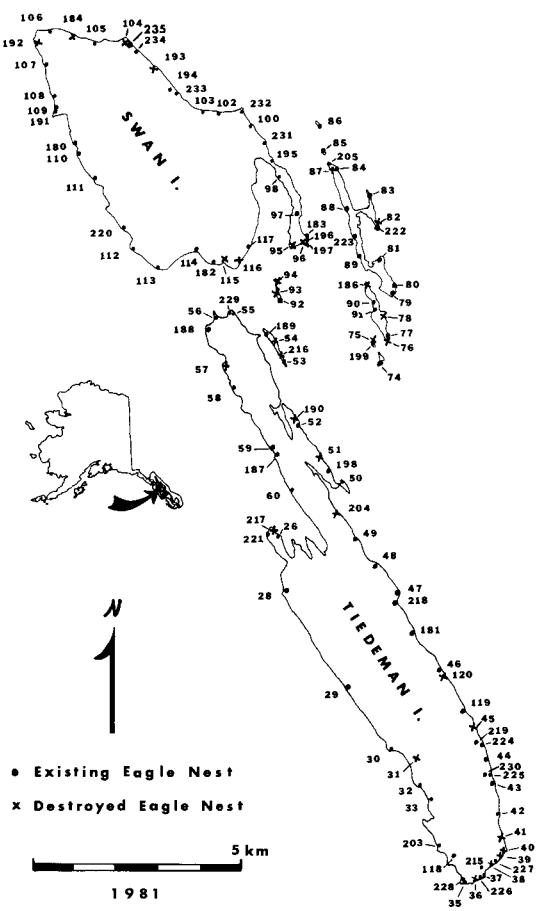

FIGURE 1. Bald Eagle nest locations in Seymour Canal, southeast Alaska.

TABLE 1. Results of Bald Eagle productivity surveys, Seymour Canal, southeast Alaska.

NEST	8 JN 1972	16JN 1973	20JN 1974	8JUL 1975	25JN 1976	25JN 1977	20JN 1978	21JN 1979	27JN 1980	18JN 1981
26	-[a]	0,1[b]	-	-	0,1	-	0,2	-	-	-
27	1,0	-	-	-	-	-	xx[c]	xx	xx	xx
28	0,1	2,0	-	0,1	0,1	-	-	0,1	-	-
29	-	-	-	-	-	0,2	-	-	-	-
30	-	0,2	0,2	-	0,2	0,2	0,1	-	-	0,1
31	-	-	-	-	-	-	xx	xx	xx	xx
32	-	-	-	0,1	0,2	0,1	0,2	-	-	xx
33	0,2	0,2	0,1	-	-	-	-	-	-	xx
35	-	-	0,1	0,1	0,2	0,2	0,2	-	0,2	-
36	-	-	-	-	-	-	-	-	xx	xx
37	-	-	-	0,2	0,2	0,2	-	-	-	-
38	-	2,0	-	-	-	xx	xx	xx	xx	xx
39	-	-	-	-	-	-	0,3	-	xx	xx
40	-	-	-	-	0,1	xx	xx	xx	xx	xx
41	-	-	-	-	-	-	-	xx	xx	xx
42	0,2	-	0,1	0,2	-	0,2	0,2	0,1	0,2	-
43	-	-	2,0	-	-	-	-	-	-	-
44	-	xx	xx	0,1	-	0,2	-	-	-	-
45	-	-	xx	xx	xx	xx	xx	xx	xx	xx
46	-	-	-	-	0,1	0,2	0,2	-	-	-
47	-	-	0,2	0,1	-	-	0,1	-	-	-
48	0,1	-	0,2	0,2	0,1	-	0,2	-	-	-
49	-	-	-	-	-	-	-	-	-	-
50	-	-	-	-	-	0,2	-	-	0,2	-
51	1,1	0,2	-	-	-	-	xx	xx	xx	xx
52	1,1	0,2	-	-	-	0,2	-	-	-	-
53	0,1	1,1	-	0,1	-	-	-	0,2	1,1	-
54	0,2	-	0,2	-	-	0,2	-	-	xx	xx
55	-	-	-	-	-	-	-	-	-	-
56	-	-	0,1	0,2	-	-	0,2	-	-	-
57	-	-	-	0,2	xx	xx	xx	xx	xx	xx
58	-	-	-	-	0,1	-	0,2	-	-	0,1
59	-	-	-	0,2	-	-	-	-	0,1	-
60	-	-	-	-	-	-	-	-	-	-
74	0,1	0,2	0,2	0,1	-	-	0,2	0,1	-	-
75	0,2	xx	xx	xx	xx	xx	xx	xx	xx	xx
76	-	-	-	-	xx	xx	xx	xx	xx	xx
77	-	0,2	-	-	-	-	0,2	0,2	-	0,2
78	-	0,2	-	-	0,2	0,1	0,2	-	xx	xx
79	1,1	-	0,1	0,2	-	0,2	-	-	-	-
80	-	-	-	-	-	-	-	-	-	-
81	-	0,2	0,2	0,2	0,2	0,1	0,2	0,1	0,1	0,1
82	-	-	-	-	-	0,1	0,2	0,1	xx	xx
83	0,1	-	-	0,1	0,1	0,1	0,2	-	0,1	0,2
84	-	-	-	-	-	-	-	-	-	-
85	-	-	-	-	-	-	-	-	-	-
86	1,1	-	-	0,1	-	-	-	-	-	-
87	2,0	-	-	-	-	0,2	0,2	-	xx	xx
88	0,2	-	-	-	-	-	-	-	-	1,0
89	-	-	0,1	0,1	-	-	0,2	0,2	-	1,0
90	1,1	-	2,0	-	0,2	-	-	-	-	-
91	-	-	-	0,1	-	-	-	-	-	0,1
92	0,2	2,0	-	-	0,1	0,2	0,1	0,1	-	0,1
93	-	-	-	-	-	xx	xx	xx	xx	xx
94	0,1	-	-	-	0,1	-	-	xx	xx	xx
95	-	-	-	-	-	xx	xx	xx	xx	xx
96	-	-	-	0,2	0,2	xx	xx	xx	xx	xx
97	-	-	-	-	0,1	-	0,1	-	-	-
98	0,1	1,1	-	-	0,2	0,2	0,1	2,0	-	-
99	0,2	-	-	-	-	xx	xx	xx	xx	xx
100	-	0,1	-	-	-	-	-	-	-	-
101	-	-	-	-	0,1	-	-	1,0	xx	xx
102	-	-	-	-	-	-	-	-	-	-
103	1,0	0,2	-	0,1	0,2	-	0,2	-	0,1	-
104	-	-	-	-	0,2	0,2	-	-	xx	xx
105	-	-	-	-	-	-	0,2	-	-	-
106	0,1	0,2	2,0	-	-	-	-	-	-	-
107	1,0	-	-	-	-	-	-	-	-	-
108	-	-	-	-	0,1	0,1	2,0	-	-	0,1
109	-	0,1	-	0,1	-	-	0,3	-	-	-
110	-	-	0,1	-	-	-	-	-	-	-
111		2,0	0,1	-	-	0,1	-	-	-	xx
112		-	-	0,1	-	0,1	0,2	-	-	-
113		2,0	-	-	0,1	0,1	0,1	-	0,1	-
114		-	-	-	-	-	-	-	-	-
115		-	-	-	xx	xx	xx	xx	xx	xx
116		-	-	0,1	-	xx	xx	xx	xx	xx
117		-	-	-	-	-	-	-	-	-
118		-	0,2	-	-	-	-	-	-	-
119	-	-	0,2	-	0,2	-	-	-	0,2	-
120	0,2	0,1	-	0,2	-	0,1	0,1	0,1	xx	xx
180		1,1	-	-	-	0,2	0,1	-	-	0,1
181		0,2	0,2	0,1	0,1	-	-	0,2	-	-
182		0,2	0,1	0,1	0,1	-	-	-	-	-
183		-	-	-	-	-	-	-	-	-
184		-	-	-	-	0,1	-	-	xx	xx
186			-	-	-	-	-	-	-	0,1
187						0,2	0,1	-	-	-
188				-	-	0,1	-	0,1	-	-
189					0,1	-	-	1,0	-	0,1
190					0,2	-	0,2	0,2	-	-
191						-	-	-	-	-
192						0,2	-	xx	xx	xx
193						0,2	0,1	-	xx	xx
194						-	-	-	-	-
195						0,2	1,1	-	-	-
196						-	-	-	0,1	-
197						0,2	-	-	-	0,2
198						0,2	-	0,1	-	0,2
199						-	-	-	-	xx
203				0,1		0,2	0,2	0,2	-	-
204					-	-	xx	xx	xx	xx
205					-	-	-	-	-	-
215							0,3	-	0,1	-
216							0,2	xx	xx	xx
217							0,2	xx	xx	xx
218							0,2	-	0,1	0,2
219								-	0,1	-
220								-	-	0,1
221									0,1	-
222									-	-
223									-	-
224									-	-
225									-	-
226									-	-
227									-	-
228									-	0,1
229									-	-
230									-	-
231									0,2	0,1
232									0,1	-
233									-	-
234									-	-
235										0,3
Total Nests	73	84	84	87	87	91	91	88	91	88
Nests Gained	0	13	1	3	4	10	4	2	14	1
Nests Lost	0	2	1	0	3	7	4	5	11	4
Active Nests	25	24	21	28	29	35	39	17	17	20
Eggs	10	13	6	0	0	0	3	4	1	2
Young	29	31	27	38	42	58	68	19	22	25

a - Inactive nest
b 0,1 Active nest 0 eggs, 1 young.
c xx Nest lost or destroyed.

period. The large amount of apparent nest loss and gain in 1973, 1977 and 1980 was partially due to intensive boat surveys during these years. The number of nests surveyed increased gradually during the first five years and then leveled out at about 90 nests. The number of new nests built each year probably equaled the loss rate. Of 33 destroyed nests, two nest trees were blown down while the remaining 31 nests were blown out of their trees.

The combined boat surveys tallied 29% of the nests as active compared to 27% for the helicopter surveys. Incorrect assessment of nest activity by boat occurred at 10% of the nest sites: 6% of the nests that were classified as active contained no eggs or young, and 4% classified as inactive contained eggs or young.

It was not possible to distinguish nesting territories on the study area because of the high density of nests and nesting pairs (Fig. 1). I found no general pattern of nest use in alternating years. Even small islets or prominent points occasionally had more than one active nest in a given year. A few nests were active in all but one or two seasons.

DISCUSSION

The Seymour Canal Eagle Management Area contains a dense population of Bald Eagles nesting in a nearly undisturbed state. Productivity of 1.56 eggs or downy young per nest with young is comparable to other studies in Alaska. Robards and King (1966) studied 160 km of shoreline habitat on Admiralty Island and found 40% of all nests active. On three surveys, the nests contained 1.96 eggs, 1.6 downy young, and 1.42 fledglings, per nest with eggs or young. Corr (1974) found a 42% activity rate and 1.6 downy young per nest with young over a three-year period in an area of southeastern Alaska with lower nesting density than Admiralty Island. Sprunt et al. (1973) reported a seven-year average production rate for Kodiak Island of 1.0 fledglings per active nest and 1.6 fledglings

TABLE 2. Bald Eagle productivity, Seymour Canal, southeast Alaska.

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	Mean
Percent active nests	34	29	25	32	33	38	43	19	19	23	29
Eggs and young	39	44	33	38	42	58	71	23	23	27	40
Eggs and young/active nest	1.56	1.83	1.57	1.36	1.45	1.66	1.82	1.35	1.35	1.35	1.56

per successful nest. White et al. (1971) found 1.5 feathered young per successful nest in 1969 on Amchitka Island.

Corr (1974) reported the loss of 2 of 75 nests during the 1967–1968 winter season and 23 of 115 nests during 1968–1969. Most of those lost in the second year were in a narrow beach fringe of timber left after logging operations and the nests succumbed to a severe storm. The 5% annual nest loss rate in Seymour Canal may hold true for southeast Alaska in general, because its exposure, terrain and vegetation are representative. This loss rate implies an average nest life expectancy of 20 years and a 50% loss of the original nests after a period of 13 years.

The annual variation in the number of young produced for Seymour Canal (range 23 to 71) indicates that environmental factors or density dependent control factors are operating, but the mechanism is unknown. Continued low productivity accompanied by a static population level may suggest that Bald Eagles in southeast Alaska have reached saturation relative to the available food supply, possibly for the first time since the bounty was abolished in 1953.

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NOTES ON THE BREEDING AND OCCURRENCE OF WESTERN GREBES ON THE MEXICAN PLATEAU

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Although the Western Grebe (*Aechmophorus occidentalis*) has been known from the interior highlands of Mexico since 1858 (Lawrence *in* Baird et al. 1858), until recently very little information has been gathered and published on the species in that region. Palmer (1962) drew attention to the dearth of information from there, and subsequently Dickerman (1963, 1973) provided data on 49 museum specimens, some many decades old, from presumably resident populations in Chihuahua, Zacatecas, Nayarit, Jalisco, Michoacán, Guerrero, Guanajuato, San Luis Potosí, and Puebla. Dickerman (1973) also reported five nests and one preflight young from Nayarit, one preflight young from Jalisco, and one "dumped" egg from Puebla to indicate breeding in those three states. In this paper I present additional data on the breeding, distribution, color phases, and status of Western Grebes on the Mexican Plateau that I obtained during fieldwork there in the period between April 1973 and June 1978. This work brings to 30 the number of localities in the interior highlands of northern and central Mexico where Western Grebes have been collected or observed (Fig. 1).

Chihuahua. I found Western Grebes at Presa de la Colina (27°35′N, 105°24′W; 25 km SW Ciudad Camargo) on 20 April 1973 and counted 30 there, including one adult escorting one large downy young that I judged to be about half grown, on 2 August 1976. The only additional locality in Chihuahua where the species has been recorded in this century is the large Presa Boquilla (Lago Toronto), about 5 km upstream from Presa de la Colina on the Río Conchos (Dickerman 1963).

Durango. I found up to 200 Western Grebes at Presa San Bartolo (24°32′N, 104°40′W; 55 km N Durango) on visits there in May and August 1975, July 1976, May and July 1977, and May 1978, and recorded eight downy young in six apparently separate broods on 15 July 1977. Six of the chicks, which comprised four of the broods, were quite small and probably were no more than one to two weeks old; the remaining two chicks were about one-third and one-half the sizes of their attendant adults. In two instances