ALASKA DEPARTMENT OF FISH AND GAME
JUNEAU, ALASKA

MOVEMENT AND POPULATIONS OF BROWN BEARS IN THE HOOD BAY DRAINAGE OF ADMIRALTY ISLAND

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Final Report
Federal Aid in Wildlife Restoration
Projects W-17-5, W-17-6 and W-17-7
Job 4.7R

(Printed July 1976)

FINAL REPORT (RESEARCH)

State: Alaska

Cooperator: Robert E. Wood

Project Nos.: W-17-5, W-17-6 and W-17-7 Project Title: Big Game Investigations

Job No.: 4.7R Job Title: Movement and Populations of Brown Bears in the Hood Bay Drainage of Admiralty Island

Period Covered: July 1, 1972 to June 30, 1975

SUMMARY

Thirty-five brown bears were trapped with Aldrich foot snares along fish creeks in Hood Bay on Admiralty Island late in the summers of 1972, 1973 and 1974. Bears were marked and life history information was collected.

Observations of bears utilizing beaches were conducted in the springs of 1973, 1974 and 1975. Minimum numbers of bears using the beaches of Hood Bay were 31 in 1973, 32 in 1974 and 19 in 1975. Using tagged:untagged ratios population estimates for these same 3 years were 104, 70 and 72 bears, respectively.

Data from observations, hunter kills and other returns indicated southern Admiralty Island bears have restricted ranges. Maximum movement recorded was 7 miles and the average movement between recorded points was 3.1 miles.

CONTENTS

BACKGROUND

On February 9, 1968 Champion International, Inc. was awarded the Juneau Unit Timber Sale by the U.S. Forest Service. This was the largest timber sale ever made in the United States and included significant portions of the better brown bear (*Ursus arctos*) habitat on Admiralty Island. The sale contract allowed for logging of approximately 95 percent of the available commercial timber in the sale area. Such intensive logging with attendant camps and roads would have greatly altered the existing habitat and the effect this development would have had on the brown bear population was unknown.

Since the completion of field work for this study, Champion International has elected to withdraw from the original contract and the withdrawl has been approved by the U.S. Forest Service. In all likelihood, this timber will not again be sold in a large, long-term sale, but most likely will be sold in smaller sales to independent bidders at some time in the future.

This study was initiated to evaluate the effects of clearcutting and logging related activities on brown bears. Hood Bay (Fig. 1) was chosen as the study area because of its large population of bears, its geographic location with respect to other bays of importance to bears, its excellent salmon streams and the fact that it was one of the first areas within the Champion sale scheduled for logging.

It was decided the best way to measure the effect of logging on brown bears was to obtain a population estimate of the bears within a proposed cutting area and determine the extent of their movements prior to logging activities. Upon completion of logging in the area, the procedure would be repeated. Population estimates would be obtained from a tagging and observation and/or recovery program. Hunter kills and observations of tagged bears would also provide movement information.

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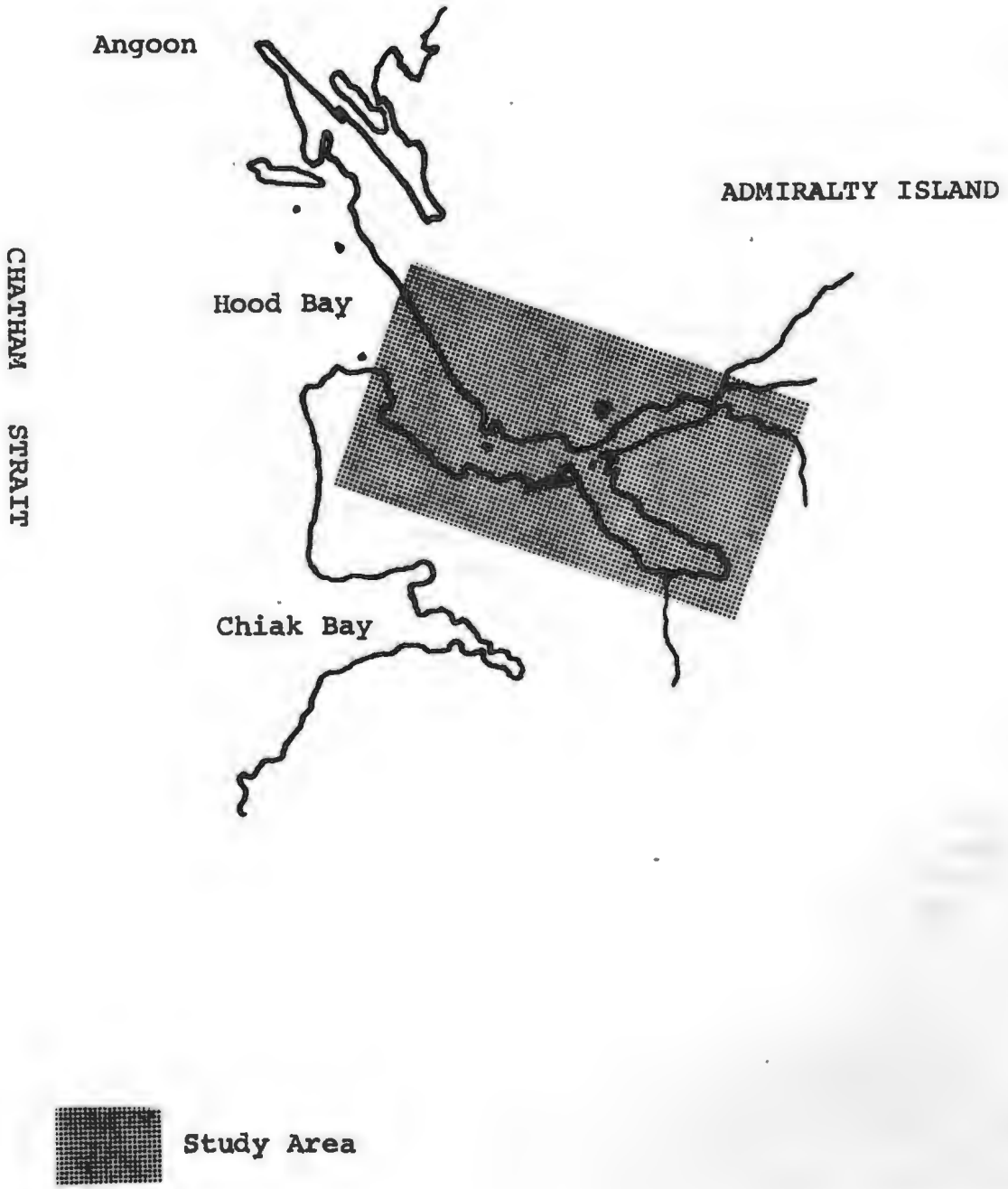
Figure 1. Hood Bay Study Area, Admiralty Island, Southeast Alaska



Capture techniques were tested and it was found that Aldrich foot snares worked sufficiently well to use as the capture technique (Wood 1973).

OBJECTIVES

To determine the density, productivity and sex and age composition of the brown bear population in the Hood Bay drainage on Admiralty Island and to measure movements of these bears within and between the Hood Bay drainage and adjacent drainages.

PROCEDURES

Fall Tagging

Aldrich foot snares were used late in the summers of 1972, 1973 and 1974 to capture bears in Hood Bay for marking and life history information. Trapping procedures remained much the same throughout the study and involved trail sets along the three main salmon streams in Hood Bay. Between 10 and 18 snares were generally kept working at any given time by two men.

Trapped bears were immobilized using drugs, dosages and procedures established by Glenn (1971).

All bears captured were ear-tagged and tattooed and in some cases identification collars were used (Wood 1973). Colored nylon Jumbo Rototags were used - white for males and yellow for females. In 1972 a Ketchum-Tamper-Proof metal cattle ear tag was used in place of one of the rototags on each bear. Holes were punched in the ears for ease of inserting the rototags. This lessened the strain placed on both the ears and the tags. Three-inch squares of colored Saflag material were placed under the rototags on the backs of the ears to aid in identifying individual bears during spring observation periods.

Bears were tattooed on both a lip and the groin with a Spaulding Fieldmaster electric tattooer.

Collars of either nylon or propylene rope were placed on most bears captured in 1972. Numbered Nasco-Flex nylon cattle markers were used in pendant fashion from the rope collars.

Standard body measurements were taken, a PM_1 tooth was extracted for aging purposes and actual weights were taken from most bears caught in 1973 and 1974. Bears were weighed with a 500-pound capacity Hanson Viking scale and block and tackle gear. Prior to 1973 weights were estimated.

Spring Observations

Bears were observed in Hood Bay during late May and early June 1973, 1974 and 1975. Simultaneous observations were made in Pybus and Gambier Bays in spring 1973. Beaches were patrolled by skiff and bears generally located with binoculars. To a lesser extent, a foot approach was made to within 100 yards, if possible, and observing was done through a 20X spotting scope.

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Most observing was done between late morning and dark with the majority of effort expended between 5:00 P.M. and 11:00 P.M.

Bears were observed until they could be identified as an individual or until the presence or absence of ear tags and/or collar was determined. Any characteristics such as color, rub marks or physical deformities that could help distinguish a bear from others were also recorded.

The minimum number of different bears seen includes only those we were sure we had not seen before.

FINDINGS

Fall Capture Success

The availability of bears along the three major salmon streams in Hood Bay throughout late summer varied considerably and appeared to be related to numbers of fish, water levels and possibly the loss of berries following frost. The fish runs in the two streams that run through the tideflats in the North Arm of the bay peak earlier and end several weeks before those in the stream in the South Arm. When the fish runs decline, the bears essentially abandon the creeks.

This 3-year trapping effort produced 38 bears, of which three were recaptures from previous years, in 543 trap-days or one bear for every 14.3 trap-days (Table 1). The most successful year was 1973 when 12 bears were caught in 80 trap-days for a ratio of one bear/6.7 trap-days.

Table 1. Trapping success, Hood Bay 1972-1974.

	North Arm		South Arm	
Date	Trap-Days	No. Bears	Trap-Days	No. Bears
Sept. 2-27, 1972	181	11	108	7
Sept. 9-24, 1973	35	4	45	8
Aug. 30-Sept. 14, 1974	123	7*	51	1**
3-Year Total	339	22	204	16

* Includes two recaptures from previous year
** Recapture from previous year

An additional eight bears were captured during the 1971-72 work on developing capture methods (Wood 1973) and are included in this report.

Marking Success

The most permanent marking technique was the groin tattoo applied with a Spaulding Fieldmaster electric tattoo machine. Groin tattoos remained clearly legible in six returns (maximum 3 years) and in one case the tattoo was easily readable after the hide was tanned. The groin tattoos were hard to locate on bears taken by hunters, however, and unless a thorough search was made the tattoos could be missed.

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Lip tattoos proved to be fairly permanent and although they were readable on all hunter kills and recaptures after periods up to 3 years, sections of the tattoo number had faded out. Likely the problem was in applying the tattoo, and if care was taken to fill in the number completely during initial application the problem might be corrected.

Nylon Jumbo Rototags were used on all bears except those tagged in September 1972 when one rototag and one Ketchum-Tamper-Proof metal cattle tag were used.

Based on the returns obtained from recaptures and hunter kills, it appeared that rototags worked much better than the metal cattle tags. Retention was better, ears appeared in better condition and visibility of rototags was much better. None of the rototags were lost although one leaf had broken off 4 of 19 tags recovered. Average time between tagging and recovery was 23 months and the longest period was 58 months.

Holes were punched in the ears prior to tagging to lessen the stress on both tags and ears in an attempt to eliminate breakage of the tag ends. Three-inch squares of Saflag remained visible for about 9 months, or through the following observation period, but were generally gone or badly worn after 12 months. The Saflag, while present, was an excellent aid in identifying individuals and could, in some cases, be seen from over a mile with the aid of a 20X spotting scope.

Nylon rope collars with hanging numbered pendants were also used as an aid in identifying bears but were not successful. The Nasco-Flex nylon pendants seemed to fade badly and were difficult to read from a distance greater than 100 yards. In addition, one collared bear which was recovered had lost considerable hair and had an open wound caused by the collar.

Development of a collar suitable for identifying individual bears from the ground at distances up to 300 yards would be highly beneficial to observations conducted under these conditions.

Spring Observations

Observation of bears utilizing beach areas in early spring was relatively easy in Hood Bay. Beaches are fairly straight, lacking the pockets and small bays found in the two other areas where observations were made.

The number of hunting parties present created problems by keeping bears off the beaches and excluding some of the better areas from our observations.

It was usually possible to approach within 200 yards of most bears and presence or absence of ear tags could be detected at this distance. It was sometimes necessary to observe a bear for up to one-half hour before the bear could be classed as tagged or untagged. Tags were most readily visible from behind the bear when its head was lowered, as hair in front of the ears usually covered the tags completely.

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The ratio of tagged to untagged bears was 1 to 3.1 in 1973 and 1 to 1 in 1974 and 1975. Maximum numbers of tagged bears present in 1973 were 25, in 1974, 35, and in 1975, 36 (Table 2, Appendix I). No allowances for mortality other than actual returns of tagged bears were used, and for these calculations it was assumed no movement from Hood Bay occurred. Population estimates based upon tagged/untagged ratios were 104, 70 and 72 bears for 1973, 1974 and 1975, respectively.

Table 2. Brown bear observations, Hood Bay, 1973 - 1975.

Date	No. Obs.	Total Bears	Numbers of Different Bears Tagged	Untagged	Unk.	Total	Max.# Tagged Bears Present
June 3-10, 1973	47	88	7	22	2	31	25
May 24-June 4, 1974	87	152	13	13	6	32	35
May 22-June 4, 1975	41	77	5	5	9	19	36

The numbers of tagged bears observed over the 3-year period represented 26 percent of the tagged bears that possibly remained alive.

Using the minimum number of different bears observed in each of the 3 years, 30 percent of the estimated population was observed in 1973, 46 percent in 1974 and 26 percent in 1975.

Movements

Indications point to only a small amount of movement out of Hood Bay. Eight tagged bears were taken by hunters and one was found dead since tagging started and only one has been outside of Hood Bay. This bear (23-72) was tagged in the North Arm of Hood Bay and shot in Pybus Bay, a minimum distance of 4.5 miles away. Total bears reported killed in Hood Bay during 1973-75 was 15 (from sealing records). The bear harvest in surrounding bays during the same period was: Pybus Bay 20, Gambier Bay 14 and Chiak Bay 17. These bays are situated so that movement could easily occur between them.

In June 1973 observations were simultaneously made in Pybus, Gambier and Hood Bays. Fourteen different bears, none of which were tagged, were seen in Pybus Bay. In Gambier Bay 29 different bears were observed (none of which were tagged) while in Hood Bay 31 different bears were seen, 7 of which were tagged. Shortly after these observations were made a report of a tagged bear was received from both Pybus and Gambier Bays from a temporary protection officer.

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Movement within Hood Bay was fairly limited, and for 19 established movements within the bay, the average was 3.1 miles. The longest movements were 7 miles by an adult boar and an adult sow.

Sex and Age Composition

The sex ratio of 44 bears captured was 48 males:100 females. The sex ratio of 18 bears under 3.5 years of age was 125 males:100 females while the ratio of tagged bears older than 3.5 years was 18 males:100 females. The sample size is small and the above figures are presented with the assumption that trapped bears were representative of the population. The ages used are from processed teeth but teeth from Southeastern bears are difficult to read and cannot be accurately read to the year. It is believed, however, that in most cases an age can be assigned which will be within one year of the true age.

Weights

Prior to September 1973 weights of captured bears were estimated while most of those caught in 1973 and 1974 were weighed using a 500-pound capacity Hanson Viking scale. The largest bear weighed was a 500 lb. 12.8-year-old sow. This bear was recaptured the following year, while accompanied by two 0.8-year-old cubs, and weighed 315 lbs. No adult boars were captured during the period when bears were weighed. Six sows between 9.8 and 15.8 years of age, all accompanied by cubs, averaged 319 lbs. The range was 250 to 390 lbs. Four cubs-of-the-year were weighed, one was a single female and weighed 95 lbs. while the other three were two males and one female from different sets of twins and weighed between 56 and 70 lbs.

Appendix I provides ages, weights and other tagging data for the bears tagged in Hood Bay.

ACKNOWLEDGEMENTS

Sincere thanks are extended to all of the following who contributed in various way to this study: Harry Merriam, Loyal Johnson, Jack Aldrich, Jack Alexander, Alan Courtright, Dave Johnson and Dave Zimmerman.

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Appendix I. Tagging Data for Brown Bears, Caught in Hood Bay, 1971 - 1974

Bear	Capture Date	Sex	Age	Weight Meas.	Weight Est.	Tattoo	Ear Tags Right	Ear Tags Left	Location
001	6/7/71	F	10.5		275	001	Y Roto 1	Y Roto 2	N.W. Corner So.Arm
002	6/9/71	F	13.5		350	002	Y Roto 3	Y Roto 4	S.W. Corner So.Arm
003	8/28/71	F	3.8*		200	003	Y Roto 6	Y Roto 5	Cabin Cr.,So. Arm
	6/19/72	F	4.8*		200	003	Y Roto 6	Y Roto 5	No. Side So. Arm 5/8/76
004	9/1/71	F	2.8		150	004	Y Roto 7	Y Roto 8	Cabin Cr.,So. Arm
005	6/11/72	M	7.5		400	005	W Roto 1	W Roto 2	Head, So. Arm 5/20/75
006	6/17/72	F	9.5		300	ADFG6	Y Roto 10	Y Roto 9	House Pt.,Hood Bay
007	6/19/72	F	4.5		200	007	Y Roto 11	Y Roto 12	Cabin Point,Hood Bay
	9/6/74	F	6.2	320		007	Y Roto 43	Y Roto 42	Head, North Arm
008	6/21/72	M	3.5		150	ADFG8	W Roto 4	W Roto 3	S.W. Corner, So. Arm
09-72	9/7/72	M	2.8		200	-	W Roto 5	Metal 2112	Head, No. Arm
10-72	9/9/72	F	2.8*		150	010**	Metal 2114	None	Head, No. Arm
11-72	9/12/72	F	12.8		350	11-72	Metal 2116	W Roto 13	Head, No. Arm
12-72	9/12/72	M	12.8		700	12-72	W Roto 9	Metal 2117	Head, No. Arm 5/21/74
13-72	9/13/72	F	5.8		300	13-72	Y Roto 14	Metal 2118	Cabin Cr.,So. Arm 5/30/75
14-72	9/13/72	F	-		175	14-72	Y Roto 15	Metal 2119	Head, No. Arm
15-72	9/14/72	M	2.8		150	15-72	W Roto 11	Metal 2120	Head, No. Arm 9/7/73
16-72	9/15/72	M	6.8+		550	16-72	Metal 2121	W Roto 12	Cabin Cr.,So. Arm
17-72	9/19/72	F	-			17-72	Y Roto 17	Metal 2122	Head, No. Arm
18-72	9/9/72	M	1.8*		100	18-72	Metal 2115	W Roto 7	Head, No. Arm

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Appendix I. Tagging Data for Brown Bears, Caught in Hood Bay 1971 - 1974 (continued)

Bear	Date	Sex	Age	Weight Meas.	Weight Est.	Tattoo	Ear Tags Right	Ear Tags Left	Location	Kill Date
19-72	9/20/72	F	16.8		300	19-72	Metal 2123	Y Roto 16	Cabin Cr.,So. Arm	
20-72	9/21/72	F	2.8		125	20-72	Metal 2124	Y Roto 18	Cabin Cr.,So. Arm	
21-72	9/21/72	M	3.8		200	21-72	Metal 2125	W Roto 15	Head, No. Arm	9/26/72 1/
22-72	9/22/72	F	6.8		500	22-72	Metal 2126	Y Roto 13	Head, No. Arm	
23-72	9/24/72	F	-		300	23-72	Metal 2127	Y Roto 20	Head, No. Arm	5/28/76
24-72	9/26/72	M	0.8		45	24-72	W Roto 16	Metal 2128	Cabin Cr., So. Arm	
25-72	9/26/72	F	0.8		45	25-72	Y Roto 21	Metal 2129	Cabin Cr., So. Arm	
26-72	9/26/72	F	10.8		350	26-72	Y Roto 22	Metal 2130	Cabin Cr., So. Arm	
27-73	9/12/73	F	14.8+		400	27-73	Y Roto 24	Y Roto 23	Cabin Cr., So. Arm	10/3/74 2/
28-73	9/12/73	M	13.8		600	28-73	W Roto 17	W Roto 18	Cabin Cr., So. Arm	5/13/75
29-73	9/13/73	F	14.8	290		29-73	Y Roto 26	Y Roto 25	Cabin Cr., So. Arm	
30-73	9/13/73	F	0.8	65		30-73	Y Roto 28	Y Roto 27	Cabin Cr., So. Arm	
31-73	9/13/73	F	12.8	500		31-73	W Roto 20	W Roto 19	Cabin Cr., So. Arm	
	9/12/74	F	13.8	315		31-73	Y Roto 52	Y Roto 51	Cabin Cr., So. Arm	
32-73	9/16/73	M	0.5	70		32-73	W Roto 21	W Roto 22	Cabin Cr., So. Arm	
33-73	9/17/73	F	3.8	200		33-73	Y Roto 35	Y Roto 34	Cabin Cr., So. Arm	5/28/75
34-73	9/17/73	M	1.8	150		34-73	W Roto 24	W Roto 23	Cabin Cr., So. Arm	
35-73	9/17/73	F	15.8	345		Shot	Not tagged	-	Cabin Cr., So. Arm	9/17/73 3/
36-73	9/20/73	M	1.8	220		36-73	W Roto 26	W Roto 25	Head, No. Arm	

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Appendix I. Tagging Data for Brown Bears, Caught in Hood Bay 1971 - 1974 (continued)

Bear	Date	Sex	Age	Weight Meas.	Weight Est.	Tattoo	Ear Tags Right	Ear Tags Left	Location
37-73	9/20/73	F	9.8	390		37-73	Y Roto 32	Y Roto 31	Head, No. Arm
	9/7/74	F	10.8	368		37-73	Y Roto 45	Y Roto 44	Head, No. Arm
38-73	9/20/73	F	0.8	95		38-73	Y Roto 29	Y Roto 30	Head, No. Arm
39-73	9/21/73	F	11.8	325		39-73	W Roto 27	Y Roto 33	Head, No. Arm
40-74	9/2/74	F	15.8	380		40-74	Y Roto 37	Y Roto 36	Head, No. Arm
41-74	9/3/74	F	4.8	208		41-74	Y Roto 39	Y Roto 38	Head, No. Arm
42-74	9/3/74	F	11.8	250		42-74	Y Roto 41	Y Roto 40	Head, No. Arm
43-74	9/4/74	M	0.8	65		43-74	W Roto 29	W Roto 28	Head, No. Arm
45-74	9/8/74	F	4.8	190		45-74	Y Roto 46	Y Roto 47	Head, No. Arm

* Estimated

** No lip tattoo

1/ Died in snare
2/ Found dead
3/ Shot in self defense

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