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BEAVER REPORT

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JOB PROGRESS REPORT (RESEARCH)

State:	Alaska		
Cooperator:	Richard H. Bishop		
Project No:	W-17-3	Project Title:	Small Game and Furbearer Investigations
Job No:	7.1R	Job Title:	Beaver Life History Study
Job No.:	7.2R	Job Title:	Beaver Population Status Techniques
Job No.:	7.3R	Job Title:	Exploitation, Sex and Age Structure of Beaver Populations
Period Covered:	July 1, 1970 to June 30, 1971		

SUMMARY

The results of beaver house counts in the Holitna drainage indicate an increase in the beaver population, possibly due to a shift in trapping pressure on the Holitna River. Populations on the Hoholitna River and Titnuk Creek appear stable, despite an increase in trapping pressure during 1970. In the Takotna drainage the population appeared to remain the same from 1969 to 1970, but local shifts in abundance occurred, possibly in response to changes in trapping pressure.

Beaver trapping effort was very low in 1971. The harvest may prove to be the lowest on record. Weather and economic factors contributed to the low trapping effort.

Continuation of the closure on the Holitna River, and expanded beaver counts are recommended.

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BACKGROUND

A brief background concerning beaver management, its objectives, problems and their relationship to this project was written in a previous report (Bishop, 1970), to which the reader is referred.

OBJECTIVES

1. To determine and compare characteristics of productivity and population composition in the Takotna and Holitna drainages.

2. To determine relative densities of beaver populations in the Takotna and Holitna drainages, and to determine the effects of ecological factors and trapping pressure on beaver densities.

3. To determine the relationships between harvest levels and population composition of beaver in the Takotna and Holitna drainages.

PROCEDURES

1. Specimens of reproductive organs and of skeletal material (for age determination) were collected from trappers in the Takotna and Holitna drainages. Comparisons of productivity and population composition will be made after examination and analysis of the specimens.

2. Relative densities of beaver populations were determined by aerial counts of occupied and unoccupied beaver houses on selected portions of the Takotna, Holitna and Innoko drainages. Counts were made from a Supercub airplane in September or October, when food caches were obvious. The location and status of each beaver house was plotted on 1:63,360 maps. Comparisons with past data were made to determine the direction and magnitude of trends.

Description and analysis of beaver habitat was begun by obtaining aerial photographs of the study areas, devising a means of assessing physiography of the streams, and selecting and characterizing selected areas of beaver habitat.

The procedure, briefly, is to divide the streams into sectors based on physiographic characteristics, select stands of vegetation characteristic of the sectors, and describe species composition and other characteristics of the stands on a reconnaissance basis. A description of the physiographic characteristics will also be included.

Reports and observations of disease, unusual mortality, etc., are presently recorded and investigated as they occur.

3. Harvest levels were monitored through beaver sealing certificate data and personal contact with trappers. Gross data on age composition were obtained from hide measurements recorded on the same records. Data on sex and age composition of the harvest were also obtained from specimens collected from trappers. Historical information on trapping patterns, harvest and related factors was recorded.

FINDINGS

Beaver House Surveys

Holitna Drainage: Beaver house counts were made in October on the Holitna and Hoholitna Rivers and on Titnuk Creek (Table 1). The season was considerably advanced compared to 1969; counting conditions were generally not as good as 1969 due to ice and snow. However, the major effect seemed to be a reduction in the number of unoccupied houses observed (Table 2).

The number of occupied houses on the Hoholitna River has increased rapidly since Burris began counts in this area in 1967 (Burris, 1969; Bishop, 1970). In 1970 the number of occupied houses did not increase significantly, compared to 1969. Trapping pressure increased considerably in 1970. Nine trappers took 102 beaver on the Hoholitna River, which probably contributed to the very small increase in the number of occupied houses.

In portions of streams immediately adjacent to the 1970 trapping camps, some beaver houses have apparently been trapped out, but aside from this, the distribution of houses was basically the same in 1969 and 1970.

The number of occupied beaver houses on the Holitna River has been consistently low since Burris began counts in 1967 (Table 2). In 1970 the number of occupied houses rose by more than a third of the 1969 total. Much of the increase occurred in a 40-mile stretch of river between Sacar Macar's camp and Caribou's (Evan Nick's) camp. The area has traditionally been trapped by people living at Caribou's, who take 30 to 60 beaver a

Table 1. Summary of dates and counting conditions, beaver house counts, McGrath area, 1970.

Area	Date	Counting Conditions	Remarks
Takotna River	10/28/70	Good	Clear to scattered clouds, temperature 20°F., no snow, some shore ice, skim of ice on most ponds. Weather about 3 weeks advanced compared to 1969.
Nixon Fork	10/25/70	Good	Partly cloudy, 15°F, no snow, some shore ice, some floating ice. Skim of ice on most ponds.
Holitna River, Titnuk Creek	11/17/70	Fair to Good	Partly cloudy, light turbulence, 5°F., little snow, some shore ice, some floating ice. Ice and snow obscured some houses, particularly unoccupied houses. Turbulence prevented counting four miles of Titnuk Creek.
Hoholitna River	11/16/70	Fair to Good	Clear, calm, 5°F., same conditions as on Holitna River.
Tuluksak River	11/18/70	Fair to Poor	Clear, calm, -5°F., 4 to 6 in. snow, considerable shore ice, some floating ice. Ponds frozen.
Innoko River, Dishna River	11/19/70	Poor	Clear, calm, -10°F., 6 in. snow, considerable shore ice and floating ice. Rivers frozen solid in places.

Table 2. Beaver house counts, Holitna drainage, 1967-1970. Areas comparable in all years.* Presence of cache indicates house is occupied.

Area	Year	No. of Houses	Cache			
			Present		Absent	
			No.	%	No.	%
Holitna River 115 river miles	1967	35	30	86	5	14
	1968	48	23	48	25	52
	1969	58	27	47	31	53
	1970*	52	37	71	14	29
Hoholitna River 119 river miles	1967	64	55	86	9	14
	1968	110	76	69	34	31
	1969	165	115	70	50	30
	1970*	147	119	81	28	19
Titnuk Creek 95 river miles	1967	38	28	74	10	16
	1968	60	41	68	19	22
	1969	79	45	57	34	43
	1970*	42	37	88	5	12

* Counts done October 16-17, beginning of freezeup. Shore ice and light snow obscured some houses, especially on the upper Titnuk Creek count area, and unoccupied houses in all areas. Four river-miles of Titnuk Creek not counted due to wind. Forty river-miles of Holitna River not counted (from confluence with Hoholitna River up 40 miles) due to absence of beaver habitat.

year. In 1970 these people trapped on Kooethluk Creek (unnamed on the map), near Nogamint. The relief from trapping pressure may have contributed considerably to the increase in occupied beaver houses in their traditional trapping area.

Ice and snow conditions on Titnuk Creek made counting very difficult, especially on the upper part of the count area. I am sure I missed a number of occupied houses in that area, although some of them may have been trapped out since 28 beaver were taken in that area in 1970. Several occupied houses were just above the count area and adjacent to the camp, however, and I think that trapping had little influence on the number of occupied houses in that area. On the lower part of Titnuk Creek the number of houses decreased from six to four, which may reflect the presence of one more trapper in an area that has been trapped steadily for years by people operating from Sacar Macar's.

Tuluksak River: Beaver houses were counted on the Tuluksak River this year for the first time. The count extended from Nyac mining area to the river mouth on the Kuskokwim (Table 3). Survey conditions were poor, but distribution and relative abundance of beaver houses were of considerable interest. There were 17 occupied beaver houses in a five- to six-mile long area of dredge tailings, where numerous ponds were formed. The tailings were produced 20 to 30 years ago and now support a considerable stand of alder, willow, birch and aspen or cottonwood. Apparently there has been enough water to encourage colonizing of all the ponds, as well as the stream itself. Most of the rest of the occupied houses observed were within the area up to 20 miles downstream from Nyac. As the river leaves the hills it changes rapidly into a meandering tundra stream with a stable channel and mature plant communities supporting few beaver food plants. In the remaining 70 miles of stream only two occupied beaver houses were seen. With marginal habitat and probably intensive trapping, it is unlikely the area will sustain many beaver. However, the upper portion of the Tuluksak River appears to be good habitat, particularly in the tailings.

The tailings are an artificially made area equivalent ecologically to many miles of active stream bed, where sufficient water and successional vegetation are in close proximity. This sort of situation seems ideal for beaver.

Takotna Drainage: Beaver house surveys on the Takotna River and Nixon Fork were done in September, before freeze-up had progressed far (Table 1). The slight skim of ice on the ponds did not interfere with the aerial counting.

The Takotna River data for 1967, 1968, 1969 and 1970 are summarized in Table 4. Burris (1969; 1971) reported the 1967 and 1968 counts. In 1968 a partial count of the Takotna River suggested an increasing number of occupied beaver houses (Burris, 1971). The 1969 and 1970 counts show a decided increase in the number of occupied houses (Table 4). However, there seems to have been little overall change between 1969 and 1970 (Table 4).

Table 3. Beaver house count, Tuluksak River, 1970.

Area	Year	No. of Houses	Cache			
			Present		Absent	
			No.	%	No.	%
Tuluksak River - Nyac mining area to mouth - 100 river-miles	1970	35	34	97	1	3

Table 4. Beaver house counts, Takotna River and Nixon Fork, 1967, 1969, 1970.

Area	Year	No. of Houses*	Cache			
			Present		Absent	
			No.	%	No.	%
Takotna River 116 river-miles	1967	60	48	80	22	20
	1969	168	101	60	61	40
	1970	160	97	61	63	39
Nixon Fork Forks to 155°30' 35 river-miles	1967	31	15	48	16	52
	1969	44	25	57	18	43
	1970	44	25	57	19	43
New area 155°30' to 155°00' 35 river-miles	1970	25	22	88	3	12

* Takotna River 1969 - 6 additional houses probably occupied; 1970 - 7 additional houses probably occupied.

Nixon Fork 1969 - 1 house, status unknown; 1970 - 1 house, probably occupied.

In 1969 the survey area was broken into four sectors on the basis of a range evaluation of valley physiography as it effected the quality and quantity of beaver habitat. Although classification is tentative, the Takotna data are given in this form in Table 5 to illustrate another point. In 1969 Sector I was trapped intensively. The 1969 survey showed a maximum of 33 occupied houses in the area. The area was essentially untrapped in 1970. The 1970 survey results show an increase of seven houses in Sector I, suggesting a response to the lack of trapping. By contrast, Sector III was untrapped in 1969, but trapped intensively for a short time in 1970. There the counts show a decline in the number of occupied houses, again suggesting that trapping had a demonstrable local influence on the number of occupied houses. The decline, however, seemed out of proportion to the number of beaver removed (42). There may have been additional contributing factors that were unknown.

Innoko and Dishna Drainages: Due to the advanced stage of freeze-up during the time of our aerial surveys, the counts on the Innoko and Dishna Rivers were considered unsatisfactory. Not only were unoccupied houses overlooked, but apparently a substantial number of occupied ones as well. Beaver house counts should not be made when considerable shore ice is present, especially with a snow cover.

Trapping Pressure and Harvest

Holitna and Hoholitna Drainage: The Holitna River above Titnuk Creek was closed to beaver trapping in 1971. A reconnaissance of the area in late February showed that no trapping had occurred. Considerable snow (35 to 45 inches) on the ground, plus cold weather, further discouraged trappers. It is also likely that the extensive use of food stamps (a form of welfare assistance) reduced considerably the incentive to trap.

Only one trapper went out on the Hoholitna River, in spite of the fact that beaver were abundant. The trapper found that in most places the ice was quite thick, up to four feet, often with little water beneath. The Hoholitna overflowed a great deal in the winter of 1970-71. As a result, this trapper took about 10 beaver.

Takotna and Nixon Fork Drainage: The Takotna River was essentially untrapped in 1971 and no one trapped the better sectors of this river. Two teenage boys trapped four beaver around the Forks.

Two trappers worked on the Nixon Fork, but snow and weather conditions discouraged them almost completely; their catch was eight beaver. For all practical purposes, these two streams were untrapped in 1971.

Other Drainages: Due to deep snow, cold temperatures and the impact of the food stamp program, trapping effort on the Kuskokwim and Yukon was at a low ebb in 1971. Most trapping was local and sporadic. On the Innoko River about 50 beaver were taken between Yankee Creek and about 40 miles below Ophir. At Cripple Landing one man took 15. There was some activity in the Shageluk, Grayling and Anvik areas, and local effort around most

Table 5. Summary of beaver house counts, Takotna River, 1969 and 1970. Data arranged by physiographic sectors of the valley.

		HOUSES					
SECTOR	YEAR	Occ.	Unocc.	Poss. Occ.	Total	Total Occ.*	% Occ.
I	1969	29	27	4	60	33	55
	1970	37	19	3	59	40	68
II	1969	16	13	1	30	17	57
	1970	18	12	3	33	21	64
III	1969	34	13	1	48	35	73
	1970	20	17	0	37	20	54
IV	1969	22	8	0	30	22	74
	1970	22	8	1	31	23	74
TOTAL	1969	101	61	6	168	107	64
	1970	97	56	7	160	104	65

* Total occupied and % occupied include "occupied" and "possibly occupied."

of the villages. The harvest data are not available yet, but it is likely this will be the lowest beaver harvest for many years, possibly ever.

Population Composition and Reproduction

Beaver specimens were not collected from animals taken in either the Takotna or Holitna drainages. Information concerning beaver pelt size, contained on the beaver sealing certificates, is not yet available.

Processing of specimens collected in 1969 and 1970 has not been accomplished to date.

Miscellaneous Factors

Because of low trapping effort in the study areas, and in the general area as a whole, few of the usual considerations in understanding the distribution of trapping pressure, trapping success, etc., are relevant.

It is probably true that if the price of beaver increased greatly it would stimulate more trapping effort. Aside from that possibility, the price or value of beaver pelts does not seem to be an important factor in determining trapping pressure.

Inclement weather in terms of snow depth and cold certainly discouraged many trappers and, in some cases, made it nearly impossible to get to the trapline where aircraft were involved.

While the true extent of the food stamp program is not known, even in general terms, it has risen considerably over the last two years. The program has surely reduced the need for cash, and for the hunting of wild game for food, and thereby has removed some part of the incentive to trap and hunt. That and other social welfare programs may well play a larger role in determining trapping effort and harvest than any other sort of factor, save a phenomenal increase in beaver pelt values.

Habitat Evaluation

Work accomplished on evaluating the ecological characteristics of the Holitna and Takotna drainages is limited to finding a source of aerial photographs of the streams, and making preliminary plans of how to evaluate the habitat in terms of physiographic and vegetational features.

Black and white aerial photographs of good quality are available for most of the Takotna and Holitna drainages. Initially, the two streams

will be examined by aerial reconnaissance and by examination of photographs and divided into physiographic sectors. The result will be divisions similar to those already made on the Takotna River but, hopefully, more precisely defined. Within the sectors on each stream, "typical" areas will be selected for study of vegetative cover, water characteristics, and other factors. The intent is to develop a reconnaissance type approach to the characterization of beaver habitat.

DISCUSSION

Until 1970, the trend of beaver numbers on the Holitna River was down, as judged by the number of occupied beaver houses seen on aerial surveys in the fall. In 1970 there was a rise of over a third in the number of occupied houses. The most obvious change in conditions that may have been related was a shift of part of the trapping effort to a stream off the count area.

The number of occupied beaver houses on the Hoholitna River remained about the same in 1970, compared to 1969, even though trapping pressure increased considerably in 1970.

The number of occupied beaver houses on both the Takotna River and Nixon Fork remained essentially the same. On the Takotna River there were local changes in abundance, which again corresponded to shifts in trapping pressure.

Trapping pressure in the study areas and in most of Units 18, 19 and 21 reached what was probably an all-time low as the result of deep snow and cold weather during the trapping season and, perhaps most important, a considerable increase in the use of food stamps. Considerable work remains to be done on specimens already collected and on habitat evaluation.

RECOMMENDATIONS

The localized closure to beaver trapping should be continued for at least two more years.

Aerial cache counts should be expanded to include several streams in Units 18 and 21.

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