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Park Engineer		
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The Beaver (Castor canadensis) Population

at Acadia National Park

1964

ACADIA NATIONAL PARK
RESOURCE MANAGEMENT DIVISION

by John C. Baird

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Introduction

During the summer of 1964 I had the opportunity to conduct an independent study of the beaver population at Acadia National Park. This study was financed by funds from the Student Conservation Program and the ~~Eastern National Park and Monument Association~~ *National Park Service*. This project was conducted under the guidance of Chief Naturalist Paul G. Favour, Jr.

The purpose of this study was to gather and evaluate data for the formulation of a beaver management plan for Acadia National Park. Information was desired concerning the number of beaver, the location of beaver colonies, their effects on plant communities and Park facilities, and the future outlook for the beaver population.

Superintendent Harold A. Hubler, Chief Ranger Gordon Bruce, Chief Naturalist Paul G. Favour, Jr., and other Park personnel were most cooperative and helpful to me in this study.

History

The beaver was one of the most common mammals found in this area during primitive times. According to estimates as presented by Seton (1928), there were about 100,000 beavers in Maine when our country was in its infant stage. The beaver has played an important role in the history of our development. To Indians the beaver provided food, clothing, shelter, and was a unit of trade. The value of the beaver pelt led to a substantial reduction in their numbers. A lack of laws and law enforcement contributed to

this decline, until the population reached its lowest point in 1899. The recovery was slow for several years; however, since 1928 beaver have undergone a steady increase.

As Acadia National Park developed and grew from its initial establishment as Sieur de Monts National Monument in July 1916, the beaver have had more and more protection, and the population increased accordingly. Many present marsh areas have had their origins in these earlier beaver flowages. There was a high density of beaver throughout Mount Desert Island prior to 1940. I believe that there was a falling off from this level during the 1940's, which can be attributed to a diminished food supply. Due to the 1947 fire which burned over the majority of the eastern half of the island, the ecological succession of plants has resulted in the development of tree species more favorable to beaver. The establishment of this more favorable vegetation has brought about a resurgence in the beaver population. Presently there is a high density of beaver in relation to the amount of available habitat. This condition is unfavorable, when we consider the welfare of the beaver population as a whole, and it leads directly to an increase in conflicts over land use.

Habitat

Acadia National Park contains nearly 31,000 acres and has many ideal sites for beaver colonies. The mountainous topography

produces many watersheds, and although many brooks become dry, as occurred during the past summer, the spring run-off and fall rains provide an ample year-round water supply when held within the flowages. It readily became apparent to me, as I progressed in my work, that nearly all the suitable habitat was being utilized. The primary factor in limiting the distribution of the beaver was the lack of an adequate food supply in many areas. As the population increases through natality and as the more favorable pioneer tree species are replaced, the food supply for the beaver will become more limited. It would be desirable to bring about a balance between these two factors. In order that the beaver may be sufficiently represented in the wildlife picture at the Park, one must take steps to provide for a continuing food supply. This balance can most easily be achieved through a management program for the beaver and will be discussed later in this report.

Food

Beaver utilize the leaves, twigs, and bark of woody vegetation. Aquatic plants are the primary summer food, when they occur in abundance. Those most readily eaten include white water lily, bull tongue, cat-tail, pickerel weed, bulrush, pondweed, duckweed, pond lily, eel grass, duck potato, water-weed, arrowhead, sedge, and bur-reed. The preferred woody species in northeastern United States are aspen, maple, willow, and ash. Many other tree species have

been reported to be utilized to some extent by beaver. These include witch hobble, cedar, alder, gray birch, white birch, balsam fir, blue beech, shad bush, and in the South loblolly pine is heavily used. (O'Brien, 1938; Shadle, 1954; Brown, 1946, and Chabreck, 1958.)

In many areas alder is extensively cut, and although it is sometimes eaten, it is chiefly used for construction purposes. The close proximity of alder to building sites and the flexibility of its stem are the main factors influencing their use in construction.

A beaver consumes between 22-33 ounces of aspen bark and twigs daily (Aldous, 1938). This varies considerably with the observations of O'Brien (1938), who states that during October and November, when feeding is greatest, they consume up to 9.9 pounds of aspen daily. Stegeman (1954) reports that one beaver will utilize 1500 pounds of aspen per year. Bradt (1947) states that a beaver cuts approximately .6 trees per day and is sustained on a single one inch aspen per day.

Aspen are generally cut about 7 inches above the ground and the twigs are cut between 1/8 and 1/4 inch in diameter. The tree itself is not usually barked above 3 inches in diameter. Trees between $2\frac{1}{4}$ - $3\frac{1}{4}$ inches appear to be preferred over larger or smaller trees. Stegeman (1954) gives the following data as an aid in estimating the amount of food in a stand of aspen: 8,890 pounds of food per acre of 1 inch aspen and 11,500 pounds of food per acre of all sized aspen. He also states that one acre of 1 inch aspen produces food at the rate of 1,350 pounds per year, as opposed to 530 pounds per year produced in a mixed age stand of aspen. In

estimating the carrying capacity of an acre of aspen, one must consider the following: (1) distance from the water, (2) slope of ground, (3) proportion of other trees, (4) proportion of large trees to smaller ones, and (5) the other foods available (Bradt, 1947). Twenty years are required to produce trees of optimum age and size for complete utilization. At 20 years aspen are approximately 4 inches in diameter at breast height, and each yields about 18.8 pounds of food (O'Brien, 1938). The above information is presented as a background for the discussion on the food availability within the Park.

The one outstanding factor directly influencing the beaver distribution at the Park is the scarcity of acceptable woody food. Sites now occupied by beaver are limited to a large extent in the amount of preferred tree species. From the standpoint of food availability the Park should be divided into eastern and western portions. A more detailed assessment of conditions at each colony is presented later; however, a general evaluation of the environment is given at this time.

The eastern portion is considered to be all Park land east of Somes Sound. A large portion of this area was burned over during the 1947 fire. This section of Mount Desert Island is the most populated, and Park facilities are developed to a greater extent here than in the western portion.

Tree species here include sugar maple, yellow birch, red maple, balsam fir, paper birch, gray birch, pitch pine, large tooth aspen, quaking aspen, black spruce, red oak, beech ash, cedar,

larch, red spruce, white spruce, white pine, red pine, hemlock, alder, pin-cherry, and willow. Large marshy areas contain many shrub species, the most common of which are sweet fern, spiraea, sweet gale, and leatherleaf. In addition to the above shrubs, herbaceous vegetation composed of cat-tails, rushes, sedges, reed-bentgrass, and other grasses are common in these marsh areas.

Despite large acreages of gray birch and other species typical of pyric succession, much of the area is composed of coniferous stands. There is no attempt here to classify the various cover types, and reference should be made to the individual colony evaluations for the habitat conditions directly affecting the beaver. There are only a few areas such as Hale's Pond and Beaver Dam Pond which support substantial stands of desired food species. On many sites the supply of food is becoming exhausted, and beaver are utilizing trees from the periphery of their normal activity range. Still other colonies are located in older-aged stands of mixed growth with a short-term supply of food.

The western half of the island is forested by mature coniferous stands. These stands are chiefly composed of white pine, red spruce, white spruce, larch, hemlock, and cedar. Scattered hardwoods occur throughout the section; the predominant species being red maple and alder. There are many abandoned beaver flowages, especially on the watershed emptying into Bass Harbor. These resulting marshy areas are characterized by essentially the same species found on similar sites within the eastern section. There are very few areas within this section which can support beaver. Small scattered colonies are

found in various places, but locations are temporary due to the lack of food species. Large bodies of water, such as Long Pond and Hodgdon Pond, can support beaver, as their size provides more available trees.

Reproduction

Beaver breed only once a year. They usually breed during their third winter, although some beaver, especially males, breed the winter before. The time of breeding varies in different parts of its range, but in Maine breeding occurs from mid-January to mid-March with the peak being in the first two weeks of February. It is quite probable that the infant mortality rate in Maine is low, and therefore placental scar counts is a relatively accurate index of productivity. Utilizing scar counts, the estimated litter size in Maine is 3.6 young (Hodgdon and Hunt, 1953). The gestation period is about 100 days, and most young are born the last two weeks in May. There is generally a 1:1 sex ratio in the litter, and the young weigh about 17.5 ounces at birth. The rate of reproduction may be influenced by temperature, nutrition, and age. Studies by Coutu (1961) and Hodgdon (1949) have shown that trapping prior to the breeding season results in a number of unbred females. The young grow rapidly and by December weigh from 11 - 16 pounds.

From the above information it is readily apparent that the beaver's reproductive potential is considerable. This information reemphasizes the need for constructive planning in regard to the regulation of the population.

Colony Composition

Beaver colonies can be divided into two basic types: bank colonies and lodge colonies. Bank colonies have an average of 2.4 beaver and occur in areas where habitat conditions are unsuitable for a lodge. A survey in Colorado showed two beaver per bank colony (Packard, 1947). A typical beaver colony with a lodge usually has about seven beaver. The lodge generally has a single interior room with two levels. The height and diameter of lodges vary considerably. There are at least two entrances, and generally there are more. Ventilation is through the top. The "smoke hole," conspicuous on snow covered lodges, is a result of the heat created by the activity of the beaver and is the best evidence that this lodge is currently occupied. Bradt found an average of 4.0 beaver at colonies with one lodge and 6.1 beaver at colonies with two lodges. In Colorado 6.0 beaver per lodge were found. Colonies are usually composed of the young of the year, yearling beaver, and adults. An estimate of the population of a given flowage can be obtained by considering the following factors: history of the area, size of the food pile, condition of recent cuttings, and track and tooth marks. Denny (1952) gives the following storage pile sizes for use in estimating the number of beaver per colony: 1200 sq. ft. = 9 beaver, 750 - 1200 sq. ft. = 7.1 beaver, and 750 sq. ft. or less = 3.7 beaver. Other indices used in estimating the number of beaver at a colony are lodge size and degree of mudding up. Dam size has been found to be a poor index to population.

James Beer (1955) found that if the male was lost, another male took over the colony, but if the female was lost, the colony was abandoned. Males and kits of the previous year may wander to some extent during the summer months.

Time restrictions did not allow me to determine precise colony numbers and compositions. Estimates of the number of beaver at each site are given in the individual colony evaluations; however, a few general comments are presented now. Through direct observation of beaver, tracks, amount of cuttings, and other activity signs, there appears to be fewer beaver per colony than might be expected. It should be stated that the summer is perhaps the most unsatisfactory time of the year for estimating the number and sex and age ratios within beaver colonies. Two-year old beaver are pushed out of the colony around the time of the birth of the young. Their movements and the wandering of the males and yearlings continues until the fall rains. In some instances (Witch's Hole) where several lodges were close together, it was difficult to determine whether all lodges represented one colony. The lack of a brush pile, heavy utilization of aquatic vegetation, and the absence of the smoke hole prevented me from making a definitive statement on such sites.

Mortality Factors

The mortality rate of beaver is generally low. The most

important mortality factors at the Park are road kills and accidental deaths during control procedures. They are preyed upon by fisher, otter, mink, bear, and bobcat.

Parasites and diseases are not common among beaver. Wilkinson (1962) has found the adult and larval forms of Platypsyllus castoris in the fur, as well as the intestinal fluke (Stichorchis subtriquetrus) in large numbers in the caecum and large intestine of Alabama beaver. Hodgdon and Hunt (1953) report that the beetle Leptinillus validus is an external parasite, but causes no harm to the pelt or hide. They also list four common internal parasites which are: stomach nematode (Travassassius americanus), intestinal fluke (Sichorchis subtriquetrus, Castorstrongylus castoris, and Stephanoproraoides larvi). Brakhage (1952) reports of one verified report of rabies in a male beaver in Missouri. Minnesota had widespread mortality among beaver in 1951 and 1952. Tularemia was thought to be the cause of this heavy mortality (Stenlund, 1953). Michigan experienced a beaver die-off in 1953, and some deaths were confirmed to be the result of Pasteurella tularensis. This disease was thought to have been spread by a tick (Ixodes banksi) (Lawrence et al, 1956). We are fortunate in the fact that tularemia is unknown among beaver in Maine.

Since there are few predators of beaver on Mount Desert Island, no serious diseases of beaver in Maine, and the normal life span is in excess of ten years, careful surveillance must be kept on a population within a limited area. The above account of the natural checks on the population emphasizes the need for management in order to insure satisfactory conditions.

Management

A. Benefits and Harmful Effects

The beaver is unique in the sense that it is able to modify an area to create more suitable conditions for its existence. This modification of the habitat can be beneficial or detrimental depending on the site and the desired use of the area. The harmful effects receive the most attention and are more apparent in some respects than the advantages. The beaver at the Park are conflicting in many areas with the proposed or primary use of these locations.

Much work has been done on the beaver-trout relationships by Bradt (1947), Knudsen (1962), Henderson (1960), Rupp (1955), Denny (1952), Yeager and Hill (1954), and others. The following account summarizes their findings. Benefits: (1) stabilize stream flow, (2) raise temperature of a very cold stream, (3) increase bottom and silt area for insect production and other food, (4) favor plankton growth, and (5) provide resting, feeding, shelter, and wintering pools. Harmful effects: (1) physical barrier, (2) lowers pH, (3) lowers oxygen supply, (4) disturbance of eggs and spawning sites by siltation, (5) increased temperature, (6) harmful to certain insects utilized for food, (7) reduces stream flow during dry periods, and (8) favors competitors and parasites. Certain streams within the Park have been adversely affected in regard to trout population (ex. inlet and outlet of Bubble Pond).

Beaver flowages which have been established for a sufficient period of time have destroyed valuable timber, as well as having

created eyesores. In certain areas such as Stanley Brook, behind Seal Harbor, considerable damage to the quality of the village green was narrowly averted. In other instances large flowages may or may not be considered to be eyesores depending upon the interest of the observer. The stoppage of water has caused the flooding of highways (Schooner Head Road) and carriage roads (between Eagle Lake and Breakneck Pond). Dammed water and beaver activity has caused roily water, etc. in the famed Sieur de Monts Spring. Flooding has endangered the Rhodora found around Great Meadow. The cedar swamp to the east of Aunt Betty Pond has been damaged by inundation, and thus its capacity to supply food and shelter for wintering white tail deer has been reduced. In other areas trails have been flooded or blocked by fallen trees.

There are also many benefits which are derived from beaver flowages. Water supplies in remote areas are most important when forest fires occur. A resident of McKinley related to me the importance of a flowage when fighting a fire behind his village a number of years ago. Beaver flowages create favorable conditions for many species of wildlife. The brushy edges are good cover for grouse. Muskrat, mink, otter, racoon, and other mammals live and feed around the aquatic habitat. Flowages sometimes provide the only source of drinking water within an area during a dry summer. Deer and hare are also benefited by this environment. Many species of ducks nest and feed within the sphere of beaver influence. Good brood rearing habitat is often found at flowage sites. Many

other birds such as the marsh hawk, red wing blackbird, great blue heron, etc. depend heavily upon these sites for providing habitat conditions favorable for their survival. Woodcock are common in the alder stage of plant succession on abandoned flowages.

Again from the above presentation we can observe the dual role of the beaver. The aesthetic value of their presence, as well as the beneficial aspects of their activity cannot be overlooked. On the other hand, one can readily see the need for effective controls, as their activity at times conflicts with primary objectives for particular sites.

B. Censusing

The best time to conduct a beaver census varies with the amount of information desired on each colony, the climatic zone of the area, and the census technique which is to be employed. Censuses are generally taken in the fall, winter, or early spring. During this period the stockpile and other signs of current beaver activity are most readily apparent.

Beaver most often are censused by airplane, especially in wilderness areas where there is a low density of beaver colonies. Swank and Glover (1948) utilize the airplane in censusing beaver in West Virginia. They conducted their census in the early spring before the leaves came out. They concluded that the autumn, after the leaves fall, would be the best season for this type of census, as the weather is fair and calm at this time. They point out two possible sources of error: (1) determining the correct number of

colonies when they are located quite close together, and (2) failure to correctly determine the number of bank beaver. A Russian symposium (1961) on census methods concludes that the higher the density, the less accurate is the aerial census.

Atwater (1940) has presented the following information in which he relates the average number of colonies found per mile with habitat conditions.

Number of colonies per mile	Habitat Conditions
6	Ample forage of preferred types, room for expansion, reliable water supply, favorable topography.
4	Same as above, but having expansion limited by topography.
2	Forage not so plentiful, expansion strictly limited and water supply variable.
Scattered colonies	Marginal forage (alder and swamp birch), topography steep and rocky, and water supply unreliable.

A low number of colonies per mile can certainly be expected at the Park when one utilizes the relationship presented above.

The most accurate population estimate is found by cruising all water courses by foot and canoe. Henderson (1960) compared spot checking of streams at specified intervals with continuous coverage of a stream. His results indicate that spot-checking does not give an accurate index to the number of colonies, especially

when areas of small size are being considered.

Obviously, to convert the number of colonies into the number of beaver present, one must know the relative number of beaver per colony in the area of the census. Some indices to arrive at the number of beaver per colony were discussed under Colony Composition. Here I would like to briefly discuss marking techniques, as live trapping and marking is perhaps the most accurate method of determining colony structure. Aldous (1940) proposes web punching as a marking technique. Its advantages are: that it is painless, is easily done, does not handicap the beaver, the hind foot is rarely scarred from fighting, and the hind feet are seldom caught in traps.

Disadvantages are that the punch hole may close by healing, and also they may be overlooked by trappers or incorrectly read. Other widely used tagging methods include ear tags and tags riveted to the tail. Both of these methods have been used with success; however, ear tags are sometimes scratched off, and tags riveted to the tail occasionally become loose and fall out. Tattooing on the tail surface has also been tested, but the marking does not hold for any appreciable amount of time.

The census technique which I employed was walking and canoeing all water courses which could support a colony of beaver. The number of beaver occupying each colony was estimated by observing the amount of cuttings, tracks, construction, and other activity signs. The results of my observation are presented in the individual colony reports, and a summary of this data is presented later.

C. Sexing and Aging

A brief discussion of sexing and aging techniques is warranted at this time. The current status of any particular colony can sometimes be ascertained by examining some of the individuals. Information on whether a colony is composed of a complete family unit, whether activity is due to a male temporarily alone during the summer, or whether a site is being occupied by new mates is valuable in assessing the overall population structure.

Patric and Webb (1960) evaluated three age determination criteria. These criteria were weight, product of the tail dimensions, and breadth of skull across the zygomatic arches. The first two criteria have reduces accuracy in the winter months. The following age classes were used: kit, up to and including twelve months; yearling, an individual in its second year; two-year old, an individual in its third year, and an adult, an individual over 36 months. They found that the age classes could be distinguished as follows:

Age class	Weight	Tail Dimensions	Zygomatic Breadth
October Kit	11-18 lbs.	16-28 sq. in.	2.5-3.0 in.
October Yearling	21-28 lbs.	34-42 sq. in.	3.2-3.4 in.
Two-year Old		43-45 sq. in.	3.5-3.6 in.
Adult	over 30 lbs.	46 + sq. in.	3.65 + in.

Shaw (1948) cites the following tail widths for age classes: yearlings, 2.8 - 3.6 inches; two-year olds, 4.2 - 4.5 inches, and adults, 4.8 - 5.5 inches. Hodgdon and Hunt (1953) suggest the use of pelt measurements and incisor tooth widths as age criteria.

These age classes are based on the following: 60 + inch pelt, two or more years old, 55 - 59 inch pelt, yearlings, and 55 inches or less, kits; and for incisor tooth widths: 4.5mm. - 6.0mm., kits; 6.0mm. - 7.2mm., yearlings, and 7.2mm. - 8.0mm., adults. Other aging techniques are based on hind foot lengths, skull length, sagittal crest length, and size and shape of the baculum. A study by Bond (1956) concludes that zygomatic breadth and other skull dimensions can also give an accurate estimate of the maturation of the beaver.

Sexing beaver can be done only by close examination. Osborn (1955) states that older males are more aggressive and swim with the head held high, as opposed to females who swim almost submerged. Four pectoral mammae are prominent in the females during lactation. The os penis is hard to determine both externally and internally in animals less than a year old; however on older beaver external or internal examination for the presence of the baculum is a quick and easy method for sex determination. Perhaps the best method available for sexing all ages is by external palpation for the presence of the testes.

D. Methods of Control

The increase in beaver since the 1930's has demonstrated their reproductive capacity and has made obvious the need for effective control. Bailey (1954) estimates that the annual surplus of beaver could be close to 40%. Trapping has been

conducted in West Virginia for a number of years, and it has been determined that they can remove 30% of the beaver per year and yet have a stable population. Much work has been done on beaver control in areas of excessive damage. These areas generally have a high beaver population. The problems are especially acute in areas where trapping is restricted or where the price per pelt is low. In the control of beaver it is advantageous to work with entire colonies. On limited areas continued checks on the population would be facilitated by working in terms of complete watersheds.

The familiar Bailey live-trap is perhaps the most widely used tool in beaver control. Many states and other agencies are engaged in live-trapping and relocating programs. On extensive areas this technique is valuable. Within the Park, however, beaver would soon find their way back to the original trapping sites or into other undesirable areas.

Electrical devices have been employed in preventing beaver from damming culverts (Figure 1). Elaborate methods of dam removal have been suggested, and drains of many types (Figure 2) have been used to discourage beaver activity at certain sites. Labor expenses connected with beaver control, and damage and maintenance of facilities are prohibitive in many of these instances. Oral contraceptives and other sterilization techniques have not been too successful, especially in high population areas, as the sterile flowages are soon occupied by an influx of non-sterile beaver.

A system of trapping permits with a profit sharing plan has greatly helped to alleviate chronic beaver problems at some locations.

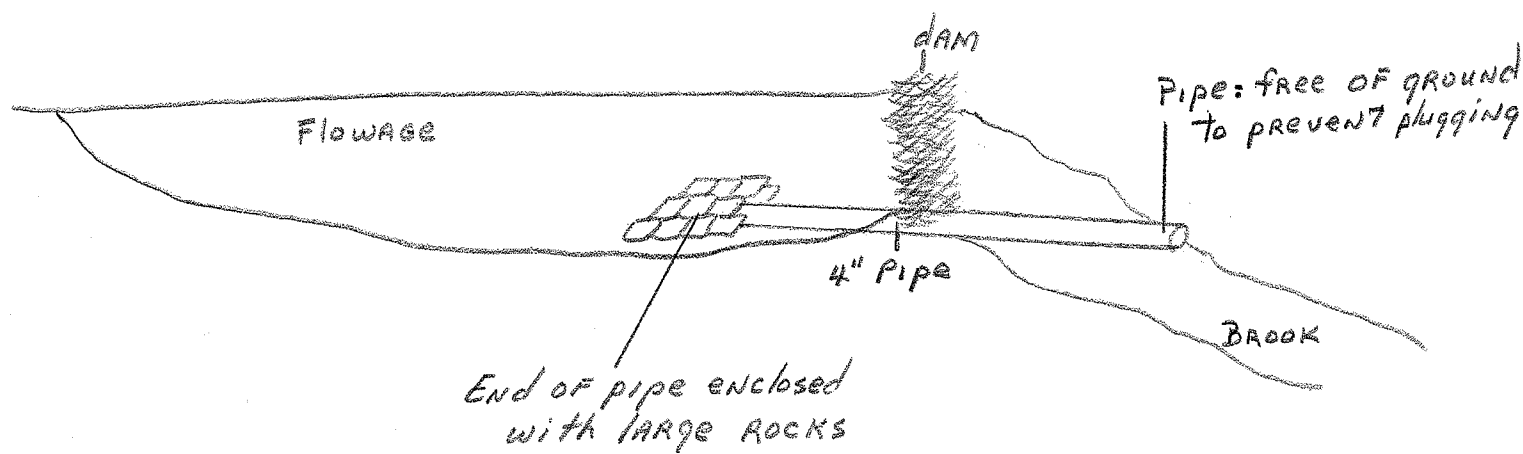


Figure 2 -- Pipe drain for continued low water levels

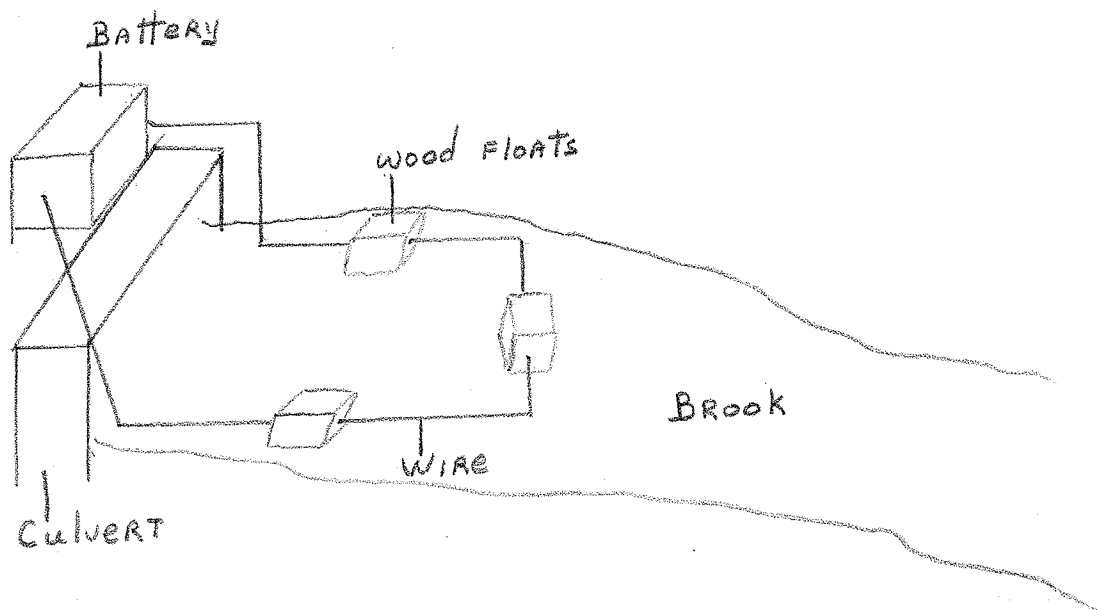


Figure 1 -- Electrical device for prevention of culvert plugging

By allotting a determined number of beaver to be taken on specified areas, the population can be controled; thus the agency is aided, as well as the trapper. On a long term basis data obtained from the beaver taken not only yields valuable scientific information, but also will aid in future management plans for the area.

Location and Evaluation of Current Beaver Activity

Park lands on the island have been divided into six regions. These areas are separated on the basis of watersheds or other topographical characteristics. The primary working unit in beaver management is the entire watershed, especially when one is concerned with a small area. Reference should be made to the appended map for specific colony locations. A summary of all current areas of activity is presented here; for a more detailed evaluation of all occupied and unoccupied sites, refer to the appendix.

Current Areas of Activity

Page
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	Location	Approximate number of beaver	Current Status	Outlook
	<u>Region I</u>			
25	Bubble Pond and inlet brook	3-4	recent activity	poor
26	Brook between Eagle Lake and Bubble Pond	1-2	Most removed by live trapping	Harmful to carriage road & trout spawning beds
27	Duck Brook	4	Limited activity	poor
28	Breakneck Ponds	7	Northern pond has large colony	good

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Location	Approximate number of beaver	Current Status	Outlook
30 Breakneck Brook	10	large flowage two colonies	good
31 Brook between Halfmoon Pond and Witch Hole Pond	6	two colonies	one colony--good one colony--poor
32 ✓ Witch Hole Pond	15-20	four to five active colonies	poor
34 Fawn Pond	1-2	limited activity	poor
35 Lake Wood	1-2	limited activity	poor
<i>Quarry - N. end Eagle Lake</i>		?	

Region II

37 Great Meadow	7-10	three areas of activity	undesirable location
38 Beaverdam Pond	9	two active colonies	good ?
38 Area between Ocean Drive and Schooner Head Road	4-5	limited activity	good (1 damage location)

Region III

41 The Bowl	2-4	limited activity	fair
42 ✓ Pond behind Sand Beach	4-5	one large colony	fair
43 Otter Creek	5	one active colony	fair
44 Canon Brook	3-4	scattered activity	poor

*or good?
(see last sentence,
p. 43)*

Region IV

45 Gravel pit by Blackwoods Campground	2-3	abandoned during summer	poor
45 Little Harbor Brook	4-5	one active colony relocated downstream from trouble area	poor

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	Location	Approximate number of beaver	Current Status	Outlook
46	Brook flowing into north end of Jordan Pond	7-10	two active colonies	good
47	Jordan Pond	7	one active colony	good
48	Jordan Stream	4-7	one active colony	poor
49	Stanley Brook	2-4	removed from area	undesirable area

Region V

50	Gilmore Meadow	3-6	one colony	fair
51	Aunt Betty Pond Area	20	several active colonies	poor--damage in certain areas
53	Richardson's Brook	9-12	scattered activity along brook	poor
54	Brook flowing through southwest valley	4-7	one active colony	fair

Region VI

56	Big Rocks Area	3-4	limited activity	poor
56	China Hill area	3-5	one active colony	poor
56	Hodgdon Pond	7-10	two active colonies	fair
57	Duck Pond	1-2	limited activity	poor
57	Heath Brook	2-3	limited activity	poor

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Beaver Activity on Mount Desert Island
Excluding Park Land

I was not able to cover much of the island outside of Park land. Nevertheless by spot checking and an aerial observation of the island, I believe that I am able to generally evaluate the status of the population on these areas. Most of the favorable beaver habitat on the eastern half of the island is within the Park. Northeast Creek, Aunt Betseys Brook, and Kitteredge Brook are the primary areas for beaver activity in this section. The wide strips of ericaceous shrubs and lack of food species along these brooks do not provide suitable habitat for beaver. In contrast to the eastern section, the western portion of the Island outside the Park offers several areas of favorable beaver habitat. Beaver occupy areas in Long Pond, Round Pond, Little Round Pond, Somes Pond, and Ripple Pond. These locations are able to support beaver as their relatively large size provides more areas for available food. The population outside Park land naturally parallels the activity which is found within the Park. There appears to be a much higher density of beaver within the Park, than on the areas of the Island exclusive of the Park.

Summary

The beaver population is approaching the saturation point within the Park. There are about 180 to 210 beaver here, and this constitutes a high density of beaver relative to the available habitat.

The two main factors affecting the population will be reviewed here.

Food availability is the most limiting factor with regard to the beaver population at Acadia National Park. Succession, past utilization by beaver, and limitations due to conflicting land usage combine to restrict the amount of food present. As these factors continue to influence the food supply, the carrying capacity will be reduced accordingly.

The topographical characteristics of the island are unfavorable for beaver activity. The mountainous terrain and the adjacent ocean result in numerous small brooks with high gradients flowing a short distance to the sea. Many water courses do not flow through a flood plain, and thus sites are limited.

In view of the present status of the beaver population, the formulation of a biologically sound and practical management plan is most desirable for the Park. Beaver damage and preventive maintenance expenses must be curtailed. We must be aware of the benefits to be derived from beaver activity and their role in the wildlife picture; however, their activity must be controlled and channelled into specific areas, so that we may obtain the most desirable results from their presence.

APPENDIX

Evaluation of Occupied and Unoccupied

Areas of Beaver Activity

* * *

Region I

Areas Currently Occupied

A. Bubble Pond and brook emptying into the southern end of the Pond.

History: Beaver activity in this area began during the 1964 summer. I believe that the beaver here came from the flowage on the brook between Bubble Pond and Eagle Lake. Live trapping and dam removal on this flowage has resulted in the movement of beaver to this new area.

Approximate number of beaver present: Activity at this location and the results of trapping from their former flowage would seem to indicate that three or four beaver are utilizing this area.

Observation of current beaver activity: About 50 yards up the brook from Bubble Pond a series of small dams have been constructed. With the dry summer little water had been held back as of the first week in August. A house was just beginning to be built in this area. The vegetation in this area is primarily mature mixed hardwoods. The most common species are: red maple, white ash, beech, yellow birch, striped maple, aspen, red spruce, and balsam fir. Several large (5 inches plus D.B.H.) aspen have been felled and some cutting on striped maple has occurred. These beaver have also been active in Bubble Pond where scattered cuttings have occurred.

Outlook: Beaver appear to be strictly limited in this area. There is a distinct lack of food, and the food available consists of large mature trees. Bubble Pond which is being used by these beaver is characterized by rocky steep slopes along its side. The vegetation along the edge of the pond consists mostly of cedar, red maple, white pine, and yellow birch and is of limited value as beaver food.

B. Brook between Bubble Pond and Eagle Lake

History: Beaver have been active for several years on the east side of the carriage road which crosses this brook.

Approximate number of beaver present: Live trapping was carried out in this area during several weeks in the summer. The trapping here resulted in the abandonment of this flowage, and the beaver have moved to the area mentioned above.

Observation of current beaver activity: One yearling beaver was sighted on this area on August 5th. Live trapping was still being conducted at this time. During later observation of the dam, it remained unrepaired, and no signs of current activity were seen.

Outlook: It is undesirable to have beaver present in this area due to its close proximity to the carriage road. ^{5 Paving Brook} The culvert has been plugged, and flooding of the road must be carefully checked. Topography and a reliable water supply make this a desired beaver location. The food supply is not abundant, but there is enough aspen and other hardwoods to support a colony of beaver for a few

years. Close observation will have to be kept on this area to prevent beaver from reoccupying this site.

C. Duck Brook

History: There are four areas of beaver activity on Duck Brook (see map). All four areas have been in existence for several years.

Area one:

Approximate number of beaver present: Area one is located a short distance above the pumping station on the New Eagle Lake Road. There are probably only one or two beaver occupying this area.

Observation of current beaver activity: There is little sign of activity around this flowage. A few gray birch have been cut, and some tracks were observed.

Outlook: This area is not suitable for supporting a colony of beaver. The food supply is very low here, and much of the vegetation is gray birch. This area supports at most two beaver, and it appears doubtful that any beaver would remain here.

Area two:

Approximate number of beaver present: Area consists of a large old flowage with many dead trees still standing, although there is little water held back there. The lack of much activity would indicate that only one beaver is present in the area.

Observation of current beaver activity: Signs of beaver activity consisted of a few tracks and sparse cuttings of gray birch.

Outlook: Vegetation is composed primarily of birch. There is a substantial stand of aspen on the eastern slope of Brewer Mountain. The terrain is low and rocky here, and a dam in excess of 500 feet in length would have to be constructed to create a flowage which would be close to the food supply. It would appear that the tremendous amount of work needed to accomplish this would discourage beaver from occupying this area. The beaver is a most industrious animal however, and as food supplies are diminished elsewhere, this site is quite apt to be developed.

Area three:

Approximate number of beaver present: Area three is located just to the west of the New Eagle Lake Road and about 150 yards downstream from the east fork of this brook. Beaver activity has been discouraged here in the past by dam removal. I would not expect to find more than two beaver in this area.

Observation of current beaver activity: Approximately 300 yards downstream from the east fork of the brook is a dam. Water is being held back in the brook. A few scattered tracks were seen in the vicinity of the dam. This dam would not hold back enough water to create a flowage. There is little activity here to suggest that this site would be developed into a definite flowage.

Outlook: Gray birch is the main tree species here. Oak, red maple, and some aspen are found in small quantities between the brook and the road. I would not expect beaver to occupy this area due to the lack of food. Area two, mentioned above, adjoins this site and would probably be occupied by beaver in advance of any development here.

Area four:

Approximate number of beaver present: Area four is located on the east side of the New Eagle Lake Road and on the east fork of the brook which is sometimes called Lispcomb Brook. Muskrats now occupy the lodge, and there is no current beaver activity here.

Observation of current beaver activity: None.

Outlook: The area has been flooded in previous years. As the beaver gradually moved downstream over the years, the flooding has endangered the road. Dams have been removed, and this has thus far discouraged any additional beaver activity here. Again gray birch is the most abundant tree species. Red maple and a few stands of aspen are also present. Although this area would not be considered the best beaver habitat, I believe that there is sufficient food to warrant close observation of the site.

*Trouble
spot
in area
flooded
cutting
over
Eagle Lake
Road.*

D. Breakneck Ponds

History: Beaver have been present in these ponds for several years.

Approximate number of beaver present: (a) There is no current beaver activity on the southern pond. (b) There are two lodges located in the northern pond. One, located at the southeast side of the pond, is unoccupied. The lodge at the northwest side of the pond is occupied and contains about seven beaver.

Observation of current beaver activity: (a) None. (b) On the northwest slope of the pond substantial cutting of 3 to 4 inch aspen has occurred. The primary area of cutting is approximately 100 yards

from the lodge. There is a considerable amount of aspen along the northwestern side of the pond. The other most common species are birch, oak, and striped maple. Dam construction is found at the outlet of the pond. This dam was removed for surveying purposes after I had checked the area. I feel confident however, that the damage was quickly repaired with little consequence to the beaver.

Outlook: (a) An old lodge is present on the northwest end of this pond. I believe it is unoccupied at present due to the lack of food around the pond. The vegetation is composed of birch, scattered hardwoods, and pitch pine stands. It is doubtful that this pond could support a colony of beaver with the present food supply. (b) The future of this colony is very favorable. The water supply is adequate, food is abundant, and the beaver should remain here for many years.

E. Breakneck Brook

History: Beaver have occupied many areas along this brook in the past. The present flowage, as located on the map, has been in existence for many years.

Approximate number of beaver present: There are two lodges located in this flowage. The lodges differ substantially in size, and I believe both houses are currently occupied. I would estimate the number of beaver here to be about ten.

Observation of current beaver activity: Three large terraced dams have been constructed here. The brook is steep and narrow

below the flowage, and thus topographically this is a most favorable site. Gray birch is very abundant in this area, but occurs mostly on the western side. Alder, red maple, oak, and mountain ash are the other most common species in the immediate vicinity of the flowage. Up the slope on the eastern side of the flowage are several large aspen stands. Aspen about 250 yards from the water are being felled.

Outlook: Succession and a diminished food supply has eliminated beaver habitat for this brook. The area of current beaver activity is perhaps the only section of this brook which could support a number of beaver. This area will be occupied for many years, as food is very abundant, and other conditions are most favorable for beaver occupation. This particular location is one of the best areas for beaver activity in the Park.

F. Brook between Halfmoon Pond and Witch Hole Pond

History: This brook has been occupied by beaver for many years.

Approximate number of beaver present: There are two areas of beaver activity along this brook (see map). (a) Area one appears to be occupied by about two or three beaver. (b) Area two is located immediately northeast of the carriage road as it passes by Halfmoon Pond. About four beaver could be expected to be occupying this area.

Observation of current beaver activity: (a) This area is a reoccupied flowage. A dam at this site has been torn out in past years, but this has been fully repaired. Due to the lack of rain during the summer, there is little water being held back by this

barrier. A few gray birch have been cut along both sides of the flowage. (b) About two acres are under water here, and many dead conifers are found throughout the flooded area. One lodge is located within these trees and is difficult to see due to the density of the dead trees. The beaver are utilizing aspen about 300 yards or more from the flowage at the top of the eastern slope.

Outlook: (a) This area does not provide good habitat for beaver. There are many ericaceous shrubs along the edges of the brook. Alder and gray birch are the principal trees here along with a few hardwoods and some conifers. I believe that the occupation of this area reflects the relatively high population pressure of Witch Hole Pond and the lack of food found there. I would not expect to see this area support a colony of beaver for more than one or two years. (b) Around the flowage the vegetation is mostly gray birch. Alders are quite abundant, and scattered red maples and conifers occur. This area is quite close to the carriage road; however, flooding of the road would seem to be a remote possibility. The beaver are traveling an abnormally long distance to reach the aspen on the eastern bank. The steepness of this slope necessitates a roundabout trip. There is a considerable amount of aspen on this slope, and it appears that beaver can be supported here for a number of years.

G. Witch Hole Pond

History: There has been a high density of beaver in this Pond for a number of years.

Approximate number of beaver present: There appears to be between 15 and 20 beaver occupying this pond. This write-up will consider all colonies collectively, and the location of the individual lodges are depicted on the map.

Observation of current beaver activity: Several beaver were sighted during observations of this area. Some gray birch has been cut along both the east and west sides at the northern end of the pond. The most cutting has occurred across the carriage road where the road forks on the western side of the pond where a small stand of aspen is located. Other cuttings were observed at various points around the pond. Dam construction is limited and occurs only at the outlet of the pond which flows into Duck Brook.

Outlook: Many beaver have been supported in Witch Hole Pond for several years. The abundance of aquatic vegetation has prolonged the usefulness of this area. The vegetation around the pond consists of wide strips of ericaceous plants and large amounts of gray birch. Aspen is scarce around all parts of the pond, and cutting is occurring in one of the last areas of supply for the preferred tree species. The high population here cannot be supported for much longer. The food supply is inadequate, and beaver will be forced to leave this area to find more suitable sites. I do not intend to say that all beaver will vacate this area or that a small number of beaver cannot be supported by the vegetation. The large amount of area around the shore will provide enough food to sustain a small colony for many years. I do feel that the population here will be much reduced

in the next few years, as the habitat has been over-utilized by the high density of beaver which have occupied the area.

H. Fawn Pond

History: Beaver have occasionally occupied this pond in the past.

Approximate number of beaver present: Current activity indicates that there are only one or two beaver using the pond.

Observation of current beaver activity: There is little sign of activity. A dam is intact at the outlet, and tracks were seen at various points around the area. A few gray birch have been cut at scattered places.

Outlook: I do not consider this pond to be very important relative to beaver activity. Steep slopes surround the area, and at least 90% of the trees here are gray birch. There are scattered alders and red maples along the edge. There is little activity here now, and there will be no increased use of this area by beaver in the future.

I. Lake Wood

History: There has been considerable activity in Lake Wood in the past.

Approximate number of beaver present: No lodge was found, and little sign of activity was observed in this lake. One or two beaver living in a bank burrow are probably using this area.

Observation of current beaver activity: Several peeled

branches and other signs of feeding activity were seen.

Outlook: This area is used as a fresh water swimming area in the Park. Beaver are not desired in the lake or along the brook to Hull's Cove Road as they have been in the past. The steep slopes and lack of food species should discourage any increase of beaver activity in this area.

Region I

Evaluation of Unoccupied Areas

A. Eagle Lake and three small brooks, previously unmentioned, which empty into it.

There were no observations of beaver activity in these areas during the summer of 1964. An old lodge is located on the northeast side of Eagle Lake, but has been abandoned for one or two years. The brooks emptying into the lake are steep and do not offer suitable areas for beaver colonies. Eagle Lake, like most of the lakes in the eastern half of the island, has a rocky shore line. This type of border offers little opportunity for bank colonies. Also characteristic of the lakes in this mountainous region are the steep slopes surrounding the water. These do not provide good areas for beaver to cut trees. The vegetation around the lake is composed of beech, oak, red maple, white birch, gray birch, red pine, and scattered conifers which offer little in regard to food.

B. Brook between Eagle Lake and Breakneck Ponds.

There are two areas which I will consider here. The first area is that part of the brook east of the carriage road. Past

activity here of damming the culvert resulted in the flooding of the carriage road. There is no beaver activity in this area now, and the location does not appear favorable for their return. The second area is located just before the outlet of the brook into Breakneck Pond. There are old dams and a lodge in this area, but no current activity. There is a sizeable stand of cedar here which would be killed should beaver occupy this area. Aspen is not plentiful here, but this location should be checked periodically, as it is quite possible that beaver activity may resume.

C. Halfmoon Pond

An old lodge is located near the eastern end of the pond, but is not occupied at the present. There is not a sufficient supply of food here to support beaver. I would not expect this area to be reoccupied due to this lack of food and the very wide band of ericaceous vegetation which surrounds the pond.

D. Brook flowing between Witch Hold Pond and Duck Brook

There has been considerable activity where the brook crosses the carriage road. The old lodge is now occupied by muskrats, and there is little food available for reoccupation by beaver.

Region II

Areas Currently Occupied

A. Great Meadow

History: Beaver have been active in this area for many years.

Approximate number of beaver present: There are probably seven to ten beaver occupying three locations within Great Meadow.

Observation of current beaver activity: A small colony of bank beaver are located close to the road which circles in the Sieur de Monts Spring area. They are utilizing a considerable amount of aspen located on the eastern side of the brook. Approximately in the middle of the meadow is a colony of beaver. A major dam and a few smaller barriers have been constructed here. Aspen is being cut on the eastern and southeastern side of the brook. Live trapping and dam removal have been taking place during the summer, but considerable activity was still occurring in the second week of August. At the north end of the meadow one or two beaver have been occupying the lodge here. The dam is holding back water, but as was previously mentioned, the lack of rain has kept flooding to a minimum during the summer. Some aspen and gray birch have been cut on the eastern side of the brook at this location.

Outlook: Great Meadow has been a major trouble spot with beaver for several years. The Rhodora which occurs around the southern end of the meadow must be kept from flooding. The famed Sieur de Monts Spring must be undisturbed or roily waters will result. There is considerable aspen along the eastern side of this meadow. It is particularly accessible at the southern end which is closest to the Spring. The water supply and abundance of food make this area

*Sewage system
at Spring area
very vulnerable
to flooding.*

attractive to beaver. It is folly to think that beaver can be kept only at desirable locations within the meadow. In order to relieve the conflict in this area for any length of time, all beaver must be removed. Unless complete measures are taken in favorable habitat such as this, conflicts will not be averted. Yearly checks of such areas must still be made to prevent new mates or other beaver from reoccupying the area.

B. Beaverdam Pond

History: One needs only to refer to the name of the area to realize the history of beaver here.

Approximate number of beaver present: There are two lodges within this pond, and this area should contain about nine beaver.

Observation of current beaver activity: Beaver activity is readily apparent along the southeastern end of the pond. Many aspens and some alders have been cut in this area. Two lodges, one small and one large, can be seen among the alders at the southern end.

Outlook: This pond is a particularly good area for beaver. There is an abundant supply of aspen, especially around the southeastern end. The water supply is reliable, and this area should support beaver for many years.

*Site along road
adj. to pond selected
for interpretation
wayside exhibit
of beaver*

C. Area between Ocean Drive and Schooner Head Road

History: Beaver have been active in this area for the past several years.

Approximate number of beaver present: This section will be divided into three areas (see map). The total of the three areas

is approximately four or five beaver.

Observation of current beaver activity: (a) Area one contains one lodge and consists of about four acres of water. A long dam has been constructed at the northern end of this flowage. Cutting is mostly confined to the western side, and for the most part is of gray birch and alder. Tracks and other signs of limited activity were seen at this location. (b) Area two in this section is commonly referred to as Hale's Pond. I observed very few signs of activity here. Tracks were evident in the mud, but this was the only apparent sign of activity. The state has experienced difficulty in recent years in keeping the culvert from being plugged. An old lodge is located in the ericaceous shrubs and is only about six yards from the road. (c) I was not able to determine whether beaver presently occupy area three.

Outlook: (a) This section of the area does not have many food species. Only an occasional aspen can be found, chiefly along the northwestern border. The vegetation is composed primarily of gray birch with some oak and other hardwoods. The area can support a very limited number of beaver, and the more attractive southern area will be preferred over this location. (b) The water level at this location was very low during the summer. Aspen is fairly abundant here with a large stand present along the southern boundary and smaller amounts occurring along the northern edge. There is a wide band of ericaceous shrubs surrounding the open water in this area. To my knowledge, only one beaver was released in the area

during the summer. I failed to observe any signs of current activity from this animal after its release here. The extremely low water level was a major factor in abandoning the area. I believe that this area could and will support a colony of beaver, if the water level can be increased and maintained. (c) This area is the most desirable in the section from the food availability standpoint. It is, however, the least desirable from the standpoint of an adequate and reliable water supply. It is difficult to evaluate the amount of water which this area contains during a summer with normal rainfall. With an increased water level in this entire section, the three areas would merge, and three or four colonies could be supported here for several years. This is one of the few areas within the Park which could possibly support more beaver.

*Schooner Head
Road vulnerable
to flooding (near
Schooner Head)*

Region II

Evaluation of Unoccupied Areas

A. The Tarn

This pond and the short outlet and inlet brooks connected with it have no beaver activity. There is not enough food, and the steep topography render this area unsuitable for beaver.

B. Eddie Brook, Kebo Brook, Cromwell Brook and Bear Brook

These areas are considered together, as they all flow through the more populated areas around Bar Harbor, and thus are unsuitable for beaver occupation. A flooded area on Kebo Brook, located on the

western side of Kebo Mountain, could not be found. I did locate a small basin in this area which appeared to retain water during rainy periods, and I believe this is the area which was suspected of being the result of beaver activity.

Region III

Areas Currently Occupied

A. The Bowl

History: Beaver have been active in this pond for the past several years.

Approximate number of beaver present: There are approximately two to four beaver currently active in the Bowl.

Observation of current beaver activity: There is an active lodge at the mouth of the brook at the northern end of the pond. The dam at the southern end of the pond was not too well fortified due to the lack of rain and low water level. Aspen and gray birch have been cut along the southeastern border of the pond. The heaviest cutting has been in the vicinity of the lodge where several aspen have been felled.

Outlook: There is an abundance of aquatic vegetation here and during the summer is heavily utilized by the beaver. Most of the trees are gray birch, pin cherry, willows, and a fairly substantial number of aspen. There appears to be sufficient food to support a colony of beaver for several years, particularly with a higher water

level and more accessible trees. This area seems to be a desirable location for beaver, as the hike to the Bowl is popular, and there are no Park facilities or vistas to be affected by beaver activity.

B. Pond behind Sand Beach

History: Beaver activity has been noted here in fairly recent years.

Approximate number of beaver present: I believe that about four or five beaver presently utilize this area.

Observation of current beaver activity: Dam construction at the eastern end of this pond has been recently repaired. Some alder and gray birch have been cut along the southern bank. The majority of the activity has been confined to the northern side of the pond where several aspen have been cut. There appears to be considerably less daytime activity here due to its proximity with Sand Beach.

Outlook: There is a considerable amount of aspen along the north bank of the pond. The south bank is steeper and consists primarily of gray birch. The beaver may possibly create an objectional eye sore here due to the Sand Beach area. A remote harmful consequence of beaver activity here is the felling of large trees so close to the Schooner Head Road. The available food here will be sufficient for colony use for a few years, but one can readily see a time limit on the occupation of this area.

*Easy
accessibility
makes good
opportunity
for visitors to
observe active
beaver area while
enjoying Lake.*

C. Otter Creek

History: Beaver have a long history of activity on Otter Creek, especially in the vicinity of current occupation.

Approximate number of beaver present: This appears to be an average colony, and there are probably five to seven beaver occupying this site.

Observation of current beaver activity: Aspen has been cut on both sides of the flowage here. Alder, gray birch, and striped maple have also been utilized to a lesser extent. Tracks are abundant along the shore, and barked twigs are apparent around the edges. A lodge is located among the alders near the center of the flooded area.

Outlook: The present flooded area is located approximately 200 yards downstream from the Canon Brook trail. This trail leads across the top of an old dam, but there is no activity at this site. The current areas of activity appear to be located on an old flowage. Beaver have been occupying this section of the brook for several years, and it is readily apparent that the colony is gradually moving upstream, as the food supply is diminished. In a few years their activity will probably flood the trail. The east side of the flowage is mostly gray birch, although a limited amount of aspen occurs. Along the brook and the land around the flowage are many alders. The west side has a large stand of aspen, with gray birch and striped maple being the other major species here. The water supply is adequate and there is considerable food around the flowage and further upstream to support a colony for a considerable number of years.

D. Canon Brook

History: Relatively little activity has been noted along Canon Brook in past years.

Approximate number of beaver present: There are probably about three or four beaver in bank colonies scattered along the brook.

Observation of current beaver activity: Areas of beaver activity along the brook were difficult to pinpoint. Regions of activity were confined to that portion of the brook between the junction of Otter Creek and the trail. Cutting of some gray birch and a few aspen have occurred at scattered points along this section. No lodges were sighted and definite centers of beaver activity could not be established.

Outlook: Canon Brook is a high gradient stream above the trail crossing. It would be practically impossible for beaver to establish a flowage above this point. Below the trail the brook is not as steep, however white ash, gray and white birch, and red spruce make up most of the vegetation. Other hardwoods and scattered aspen are also found along the brook. Although this area will probably continue to support some beaver, I don't think that any major activity will occur here.

Region III

Evaluation of Unoccupied Areas

A. Brook through the community of Otter Creek.

Close proximity to inhabited areas, topography, limited water supply, and the lack of food are the primary reasons that this brook does not support beaver.

Region IV

Areas Currently Occupied

A. Old Gravel Pit -- east of Route 3, located about 1/3 of a mile south of the entrance road to Blackwoods Campground.

History: Occupation of the area has been within the past year.

Approximate number of beaver present: One to three beaver were active here during the early months of the summer.

Observation of current beaver activity: A lodge had been constructed on the western bank of this flooded gravel pit. Fresh tracks were abundant during the late spring and early summer. Aspen and alder have been cut along the southeast end of the pond. This site was abandoned during the late spring or early summer. There was a lot of human activity in this area, and the pond almost became completely dry as the summer progressed.

Outlook: I believe that this particular situation emphasizes the lack of beaver habitat in the area. There is only a limited food supply here, and this site would not be preferred from a number of standpoints. It was not undesirable to have beaver located in this area, but the location could not support beaver for a year particularly with a below normal amount of rain.

B. Little Harbor Brook

History: Considerable beaver activity along the lower section of the brook has occurred in the past. The area of current activity is also adjacent to an old flowage.

Approximate number of beaver present: There are an estimated four or five beaver at this location based on live trapping results and signs of current activity.

Observation of current beaver activity: The trail crossing the brook in the vicinity of Mitchell Hill was flooded during the early part of the summer. Observations in this area in the second week of August indicate that beaver activity here has been discouraged. Water was no longer flooding the trail and was running freely through a series of destroyed dams. The beaver causing the trouble here have relocated about 100 yards downstream in a former beaver flowage. Large aspen are being cut on the western border of this area. Dams have been constructed here, but did not hold back a significant amount of water at the time of observation.

Outlook: The vegetation around the trail area and around the new location consists of mature white birch, striped maples, beech, and aspen, mixed with red spruce and hemlock. There is not much food here as the preferred species are only sparsely scattered along the borders of the brook. This area can support a limited number of beaver for a short time. Unless the beaver are removed from this new location, the trail will again become flooded, as they exhaust the small amount of food around their present location.

C. Brook flowing into the north end of Jordan Pond

History: Beaver colonies along this brook have been active for several years.

Approximate number of beaver present: There are about seven to ten beaver in the two adjacent flowages along this brook.

Observation of current beaver activity: There are two flowage areas located next to each other in this area. Barked twigs are common around the southern ends of both ponds. I believe that both lodges in this location are active; however, one is considerably larger than the other. Some birch and a substantial amount of aspen have been cut on the eastern slopes.

Outlook: White ash, red maple, alder, and gray birch compose most of the vegetation along the western border of this flowage. On the eastern slope a large amount of gray birch occurs, but there are also considerable stands of aspen in this region. The abundance of this aspen, the adequate water supply, and the topography make this a favorable site for beaver. Conditions are such that they should continue to occupy this area for several years.

D. Jordan Pond

History: Beaver have been located at the northern end of Jordan Pond for a number of years.

Approximate number of beaver present: There is an average sized colony of about seven beaver occupying a lodge in the inlet at the northern end of the pond.

Observation of current beaver activity: Beaver do not appear to be using the main portion of Jordan Pond to a significant extent. There is very little food around the pond, and the shore is very rocky. The lodge is located in the small inlet here and is about

150 yards from the aspen stands on the southwestern slope of the Bubbles. Some gray birch and a good quantity of aspen is being utilized from this area.

Outlook: New bridges along the trail here have eliminated any conflicts which have occurred. The beaver have not had to construct a dam in this area, and no flooding has occurred. The western border of this location consists of gray birch, oak, cedar, and red spruce. Gray birch is the primary species on the eastern slopes, but aspen is plentiful in this area. The reliable supply of water and the abundance of aspen will allow this area to support beaver for many years.

B. Jordan Stream

History: Beaver have been located here for a considerable number of years.

Approximate number of beaver present: A colony of about four to seven beaver occupies an area on this stream just north of Long Pond.

Observation of current beaver activity: A dam is located about 200 yards upstream along the eastern side of the ericaceous growth on this area. One to two acres have been flooded and a lodge is situated in the eastern half of the flowage. Aspen, alder, and some gray birch have been cut chiefly along the eastern border of the area.

Outlook: The flooding in this area is apt to kill a small number of cedar. Gray birch, cedar, alder, and spruce are the

principal species found around the flowage. Larger aspen are located along the eastern side of the area. The food supply here is strictly limited. Although this area could support one or two beaver in the future, the food supply is not abundant enough to maintain a full colony for many years. Beaver activity here is located around the Park boundary, and I believe that the major portion of the activity occurs outside the Park.

F. Stanley Brook

History: Beaver have just located in this area during the past spring.

Approximate number of beaver present: I would estimate that there were two to four beaver utilizing this site.

Observation of current beaver activity: Beaver have constructed a series of small dams in this area. The flooding here resulted in a premature color change in the leaves of the red maples. Very roily water was indicative of the considerable activity in this area. I did not locate a lodge or burrow, but I believe the beaver lived at the northern end of the area. A few aspen, some alder, and scattered red maple have been cut.

Outlook: Again I believe that occupation of this area is indicative of the lack of good beaver habitat. The beaver which were present here have been removed, to the best of my knowledge. The location is not good beaver habitat, and their presence here is most undesirable. Many marginal beaver habitats in undesirable locations, such as this, must be checked periodically to prevent extensive damage.

Region IV

Evaluation of Unoccupied Areas

A. Hunter's Brook

There is no current beaver activity along this brook. The only area of past activity was in the vicinity where the most western branch of the brook forks from the main stream. Transplants on Hunter's Brook in 1963 by the Park have been unsuccessful. This brook has a relatively high gradient and for the most part is bordered by mature conifers. Topography and lack of food are the principal factors why this is not occupied and is unsuitable habitat for beaver.

B. Upper Hadlock Pond and the brooks emptying into this pond

I did not observe any current activity in the vicinity of Upper Hadlock Pond. Two old beaver lodges are present around the northern edge of the pond. The primary tree species in this area are red spruce, white cedar, beech, balsam fir, and red maple. The brooks flowing into the pond are steep and did not appear to have a continuously adequate water supply. This area can possibly support one or two beaver, but a colony of beaver would not be expected.

Region V

Areas Currently Occupied

A. Gilmore Meadow

History: Beaver have been active in this region for several years.

Approximate number of beaver present: The small colony located here consists of three to six beaver.

Observation of current beaver activity: At the southeastern end of the meadow in the vicinity where the brook forks, there is a small colony. The brook is dammed here, but little water was being held back due to the low water supply. A good sized lodge is located in the middle of the flowage area. Some gray birch and aspen have been cut mostly along the southwest edge of the pond.

Outlook: There are vast areas of ericaceous shrubs in this region. To the south and upstream on the brook some aspen can be found, but the predominant tree species is the gray birch. This area is able to support a limited number of beaver for a few years. The future longevity of this site will depend on the number of beaver present on this area.

B. Aunt Betty Pond

History: There has been a high population and a long history of beaver occupying this pond.

Approximate number of beaver present: The brook flowing into the northeast end of the pond and the pond itself will be considered here. I would estimate that there are about 20 beaver occupying these areas.

Observation of current beaver activity: Area one, which consists of all beaver activity on the northeastern brook, will be discussed first. A lodge is present about 60 yards below the deer enclosure at the upper end of the brook. Gray birch and aspen are being cut on the slopes to the northeast of the lodge. Some limited dam construction is present here, but most of the water is

being held back by a large dam in the middle of the meadow. At the western end of the meadow beaver were still present during the last week of July despite dynamiting, live trapping, and dam removal. A new lodge was being constructed here and some gray birch has been cut along the southeast border. A large dam at the end of the meadow has been torn out repeatedly during the summer. The brook flows through a narrow passage from here until it enters Aunt Betty Pond. Two small dams have been constructed on this section, and although a few gray birch and alder have been cut here, I was not able to determine whether beaver continuously occupied this area.

Outlook: Flooding by beaver in this area has killed many cedars which border the meadow on the northeastern side. Extensive flooding has resulted in a considerable loss of winter browse for deer. Activity further downstream has contributed to the amount of water being held back here. The section causing the most damage is at the upper end. It is in this region where aspen is abundant on the slopes. Gray birch and alder are the most common species found throughout the area, although considerable aspen is found particularly at the upper end of the brook. Beaver activity in this area will be most difficult to eliminate. The abundant supply of aspen and the close proximity of Aunt Betty Pond will make this area a chronic trouble spot.

Observation of current beaver activity: Area two consists of Aunt Betty Pond. There is a large active lodge on the western side of the pond, a smaller lodge currently occupied above the outlet to Richardson's Brook, and a bank house just east of Richardson's

Brook which is also active. A lodge at the northeastern corner is unoccupied. There are many aquatic plants in the pond such as pickerelweed, white and yellow water lily, rushes, horsetails, etc. This vegetation is being heavily utilized when it is available. Along the western and southern borders of the pond gray birch has been cut. Several beaver were observed while checking this area.

Outlook: There is a zone of about 50 yards around the pond which consists mostly of ericaceous shrubs or gray birch. Red maple, red spruce, white pine, and various hardwoods occur at scattered points around the pond. This area was at one time among the best beaver locations in the Park. Today there is a severe shortage of food here and conditions are not suitable to support many beaver. Additional beaver cannot be supported here, and I believe that the population will be much less in one or two years. This pond will be occupied during the summer months by males and two-year olds, as the abundant aquatic plants provide much food. During the winter however, few beaver are likely to remain here due to the lack of woody vegetation.

C. Richardson's Brook

History: This brook has been one of the most populated areas for many years.

Approximate number of beaver present: There are about nine to twelve beaver scattered along this brook.

Observation of current beaver activity: Beaver activity was scattered along the brook. Areas where I believe bank beaver to be are delineated on the map. Barked twigs and cuttings among alder and gray birch were the chief signs of activity. A sizeable

flowage which I was not able to check was reportedly located on the most northern branch of this brook. The approximate location of this area is also marked on the map.

Outlook: There is little food for beaver along the brook. Gray birch composed most of the vegetation with red maple, alder, and red pine rounding out the other major tree species. Many areas along this brook are littered with dead trees from the fire. I believe that some of the beaver activity here is the result of the transplanted beaver which were placed in Norwood Pond. The lack of woody species in Aunt Betty Pond has no doubt contributed to the activity here. Food supplies along the brook are poor although better than that found in the pond. Scattered beaver can be supported along this brook, but the habitat no longer offers suitable conditions for many beaver.

D. Brook flowing through Southwest Valley

History: Beaver activity along this brook and the flowage occurring at the upper fork has been in existence for a number of years.

Approximate number of beaver present: There is a large flowage here, and about four to seven beaver probably occupy this area.

Observation of current beaver activity: Current activity here is on an old flowage area. Gray birch and aspen are being cut along the northeastern border of the pond. A large lodge is located on the eastern end of the flowage.

Outlook: This area has been utilized by beaver for a number of years. Topographically the area is ideal for creation of a large flowage. White pine and gray birch are the most common woody species here. Aspen, alder, and red maple can be found in limited amounts around the flowage. It appears that this area can support beaver for several more years. The food supply here is adequate for a small colony, and in comparison to some other locations the future of this area is quite favorable.

Region V

Evaluation of Unoccupied Areas

A. Norwood Pond

Despite attempts to introduce beaver to this area, there is no current activity here. The water level was low but adequate for supporting a beaver colony. There is very little food here, and thus would not provide suitable beaver habitat.

B. Sargent Brook

A very limited amount of beaver activity has occurred here in the past. A high gradient, unreliable water supply, and the lack of food render this area unsuitable for beaver occupation.

Region VI

Region VI is composed of all Park land west of Somes Sound. There is an extremely low density of beaver here as compared with

the eastern half of the Island. The time limitations did not permit as thorough a coverage in this section as was conducted in the eastern half. I do feel that if any beaver activity was omitted here, it had not developed into a sizeable flowage. The areas of current activity are considered first, and the remaining area will be considered as a whole.

There is one colony on the watercourse flowing into the southern end of Bass Harbor. It is located in the Big Rocks section of this area. The flowage area is only about one acre in size. A lodge about seven feet in diameter is located near the center. I believe that about three or four beaver are occupying this site. Although various sections of this area could possibly support scattered beaver, habitat conditions from the standpoint of food are unfavorable. In the vicinity of the flowage are a few large aspen, red maple, and an abundance of alder. This location cannot be expected to support a full colony of beaver for any length of time.

The beaver activity in the China Hill section has been present for many years. About two acres have been flooded here, and approximately three to five beaver are occupying this area. Vegetation consists mostly of red spruce, alder, some aspen, and scattered hardwoods. Cutting has occurred on all sides of the flowage with alder being the most frequently utilized. This area is typical in that there is a lack of food, and it does not seem that this location can continue to support many beaver.

At the southern end of Hodgdon Pond are two active lodges. About seven to ten beaver occupy this location. Alders have been

cut on the west side of the pond; however, aquatic plants are heavily utilized here during the summer. The pond is bordered mostly by conifers, although red maple and scattered hardwoods are found. There is a limited food supply in this area. The large area of the pond and the abundance of aquatic vegetation allow this many beaver to be supported here. With the above conditions beaver activity here would be expected to continue for a number of years.

Some beaver activity was observed at Duck Pond. The scarcity of fresh signs of activity suggests that only one or two beaver occupy this area. A few alder have been cut here, but the vegetation is almost entirely coniferous trees. Beaver activity cannot be expected to continue for long in a region with so little food.

Just north of the Old Seal Cove Road on Heath Brook is a small flowage. Conifers compose at least 90% of the tree species here with alder, red maple, and very few aspen occurring along the border of the Brook. There are only two or three beaver utilizing this area, and occupation is no doubt temporary, as there is very little food.

The large amount of unoccupied areas in the region can be classified into two general categories. One category is composed of short steep brooks flowing directly into the ocean (Man of War Brook, Halfway Brook, etc.). The other category is composed of slow flowing brooks with extensive marsh areas. The former category of brooks do not contain beaver due to the high gradient and uncontinuous water supply, but in common with the remaining areas they do not have enough food to support beaver. The slower brooks (Marshall Brook and its tributaries, Hodgdon Brook, etc.) have

supported high densities of beaver in past years. Succession, increased fire protection, and their utilization of food species resulted in a substantial lack of food throughout this region. A few scattered individual beaver could be supported on these areas, but a considerable number of beaver cannot be expected unless drastic alteration of the environment occurs.

Scientific Nomenclature

Common Name	Scientific Name
Aspen	<u>Populus grandidentata</u>
	<u>Populus tremuloides</u>
Red Maple	<u>Acer rubrum</u>
Sugar Maple	<u>Acer saccharum</u>
Gray Birch	<u>Betula populifolia</u>
Paper Birch	<u>Betula papyrifera</u>
Yellow Birch	<u>Betula lutea</u>
Red Spruce	<u>Picea rubens</u>
White Spruce	<u>Picea glauca</u>
Black Spruce	<u>Picea mariana</u>
Loblolly Pine	<u>Pinus taeda</u>
Eastern White Pine	<u>Pinus strobus</u>
Pitch Pine	<u>Pinus rigida</u>
Red Pine	<u>Pinus resinosa</u>
Willow	<u>Salix</u> spp.
Northern Red Oak	<u>Quercus borealis</u>
Larch	<u>Larix laricina</u>
Hemlock	<u>Tsuga canadensis</u>
Pin Cherry	<u>Prunus pensylvanica</u>
Shadbush	<u>Amelanchier laevis</u>
Beech	<u>Fagus grandifolia</u>
Balsam Fir	<u>Abies balsamea</u>
	<u>Alnus crispa</u>
Alder	<u>Alnus incana</u>

Trees and Shrubs (cont.)

Common Name	Scientific Name
White Ash	<u>Fraxinus americana</u>
Cedar	<u>Thuja occidentalis</u>
Witchhobble	<u>Viburnum alnifolium</u>
Sweetfern	<u>Comptonia peregrina</u>
Sweetgale	<u>Myrica gale</u>
Spiraea	<u>Spiraea</u> spp.
Leatherleaf	<u>Chamaedaphne calyculata</u>
Rhodora	<u>Rhododendron canadense</u>

Herbaceous Plants

Reed-bent Grass	<u>Culamagrostis canadensis</u>
Cattail	<u>Typha</u> spp.
Waterlily	<u>Nymphaea</u> spp.
Sedge	<u>Carex</u> spp.
Bulrush	<u>Scirpus</u> spp.
Duckweed	<u>Lemna</u> spp.
Duck Potatoe	<u>Sagittaria cuneata</u>
Arrowhead	<u>Sagittaria</u> spp.
Burreed	<u>Sparganium</u> spp.
Pondweed	<u>Potamogeton</u> spp.
Pickereel Weed	<u>Pontederia cordata</u>
Waterweed	<u>Anacharis</u> spp.
Eelgrass	<u>Zostera marina</u>

Birds

Common Name	Scientific Name
Great Blue Heron	<u>Ardea herodias</u>
Grouse	<u>Bonasa umbellus</u>
Marsh Hawk	<u>Circus hudsonicus</u>
Woodcock	<u>Philohela minor</u>
Red-wing Blackbird	<u>Agelaius phoeniceus</u>

Mammals

Hare	<u>Lepus americanus</u>
Fisher	<u>Martes pennanti</u>
Otter	<u>Lutra canadensis</u>
Muskrat	<u>Ondatra zibethica</u>
Raccoon	<u>Procyon lotor</u>
Deer	<u>Odocoileus virginianus</u>
Bear	<u>Ursus americanus</u>
Bobcat	<u>Lynx rufus</u>
Mink	<u>Lutreola vison</u>

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