A PROPOSAL TO STUDY BEAVER DISTRIBUTION, ABUNDANCE AND HABITAT CHARACTERISTICS ALONG BIG CREEK DRAINAGE, IDAHO PRIMATIVE AREA

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INTRODUCTION

The Idaho Primitive Area is a unique area for wildlife studies in that it is nearly free from the impact of man. Within the last few years the presence of a population of beaver (castor canadenis) has been reported near the Taylor Research Facility, located within the Idaho Primitive Area. At present no research has been conducted to assess the site or extent of distribution of this resident population. A need exists for baseline data to evaluate population size, activities, and habitat use patterns. This data will provide basic information on present status of the population, and will serve as a quantitative data base for future research.

The objectives of the proposed study are:

1) Determine the abundance and distribution patterns of beavers within the study area.
2) Provide a quantitative analysis of the associated habitat.
3) Determine the use of woody vegetation in relation to availability.
4) Determine the preference and utilization of woody vegetation by species, size, class and distance from shore.
5) Identify characteristics of preferred habitat.
6) Conduct a reconnaissance of unexploited habitat within the study area.

LITERATURE REVIEW

While information on beaver population is not now available for the Idaho Primitive Area, much background information is available from other geographic areas. Beaver, more than any species except man, are capable of inflicting change in their environment. This change affects the well being of associated forests, fish and wildlife. It is for this reason that the beaver has been the subject of many years of study throughout North-America.

Rutherford (1955) studied the environmental relationships of beaver in the Colorado forests. His findings demonstrated that beavers have certain environmental requirements, and that their occurrence can therefore be predicted on the basis of these factors. Excess stream gradient was determined to be a major deterrent to permanent beaver occupancy. Even in areas of high quality food supply a stream gradient of greater than 8% was effective in deterring colonization. Rutherford's findings also indicated that forest fires were directly responsible for establishing preferred beaver habitat. Forest fires in the Colorado forests were followed by the appearance of quaking aspen (populus tremuloides) and willow (salix sp.), two sub-climax species which constituted the principal forage of beavers.

A study along Sagehen Creek, in the Sierra Nevada Mountains of California, likewise emphasized the importance of aspen and willow in preferred beaver habitat (Hall 1960). Aspen, the primary tree species selected by beavers, was selectively cut until the supply adjacent to the colony was totally depleted. Since the aspen seedlings are unpalatable to beavers, the removal of the mature stand represented the end of the colony's aspen consumption phase. The term "aspen consumption phase" was used by Hall to describe

the early phase of beaver population in an area. A beaver population living in a relatively dense stand of aspen could therefore be assessed as a young colony relative to that habitat. Willow, the second woody staple of beaver, was utilized heavily in the absence of aspen. It should be noted that in Hall's study, as many as ten plant species were taken to some degree by beavers, although to a much lesser extent than aspen and willow.

Beaver have been shown to have well-defined social structure and habits. Beaver mate at about 2½ years of age. The average litter born in spring consists of three to four kits. Average colony size, including young of the year, is nine to ten beavers. These include two breeding adults, three to four yearlings, and the spring born young. In the second year, the two year olds are driven from the colony site. This forced dispersal is undertaken by the pregnant female just prior to parturition. (Bradt 1947). This social intolerance and subsequent dispersal is the primary mechanism for colonization of unoccupied habitats.

STUDY AREA

The study area is located within the rugged country of the Idaho Primitive Area. The Taylor Ranch Research Facility will serve as headquarters out of which the study will be conducted. The study area will include that portion of Big Creek between Monumental Creek and the middle fork of the Salmon River. This is approximately a twenty-five (25) mile section of Big Creek with elevation varying between 1,160 and 1,520 meters. In addition to Big Creek, all major tributaries draining into Big Creek within the study area will be searched for a distance of 8 kilometers. A map showing study area has been included in this proposal.

METHODS

The study area will be systematically searched by foot for evidence of beaver. Beaver colonies will be identified by the presence of cutting sites, bank dens and bank trails. All areas showing evidence of beaver activities, past or present, will be marked on topographical maps of the area. Active colonies will be determined by presence of fresh cuttings, droppings and tracks. On all sites judged to be active, stream characteristics will be recorded, including depth, width, velocity, gradient, and water temperature. Stream depth will be measured at three locations located ten meters apart. The first depth measurement will be taken in front of the bank entrance to a den. The second and third measurements will be taken ten (10) meters up and downstream from the den entrance. Stream width will be measured in a similar manner. Related stream velocity will be measured by timing the travel of a floating bobber a distance of twenty (20) meters. The bobber will be released ten (10) meters above the den entrance and will be timed to the third marker. Stream temperature will be recorded directly. Stream gradient will be measured over a thirty (30) meter distance using a hand level and cord line.

Bank slope will be determined by use of a clinometer. Vegetation sampling will be conducted by the Belt Transect Method (NAS-NRC 1962). Sampling belts will be two (2) meters in width and fifty (50) meters in length. Three belt transects will be placed on each side of the stream, beginning at the bank and running perpendicular to the stream course. In homogeneous habitat the belts will be evenly spaced in order to provide adequate cover of area. Sampling will be stratified in heterogeneous habitat. Each fifty (50) meter belt transect will be divided into

ten (10), five (5) meter sub-plots to allow measurement of vegetation use related to distance from stream. All vegetation data will be recorded within the sub-plots. All woody vegetation with a diameter greater than 0.3 cm will be identified and recorded. Special notation will be made on cut trees. Tree diameter will be measured at a height of 30 centimeters, except for cut trees which will be measured at the height of the cut. Three samples of Herbaceous species will be taken in each sub-plot by use of a 20 x 50 cm frame (Daubenmire 1970). The frame will be randomly placed and all species will be identified and percent cover will be estimated. A sample of the data sheet to be used for data collection is provided in this proposal.

Maximum cutting distance from stream will be measured. All physical signs of beaver will be noted including dropping groups, tracks, and actual sightings. This information will be helpful in estimating abundance of animals within a given colony.

Two soil samples will be collected at each colony site, one on each side of the stream. Soil samples will be numbered according to site and stream side for later analysis of soil texture and other relevant characteristics. Sampling will be conducted uniformly for each active colony. After site characteristics have been recorded and cutting area identified all stems of diameter greater than 0.3 cm will be marked with red paint. This will allow for determination of beaver's rate of woody vegetation consumption per time interval of visit (Hall 1966). Each site will be revisited at intervals of five (5) days. At subsequent visits newly cut stems will be tallied and painted. Tracks will again be measured and counted, along with droppings. During each visit tracks will be

brushed out and dropping removed to eliminate the problem of double counting.

After collection of the quantitative data has been completed a general description will be written for each site. Surrounding forest vegetation will be classified into habitat types according to the key prepaired by Daubenmire and Daubenmire (1968). Characteristic photographs will be taken at each site to be later used as interpretive tools. If time allows, selected colony sites will be observed on a regular basis from tree blinds. Periods of observation will be three hours in early morning and again before dark. Information will be recorded on behavior patterns. In addition, direct observation will serve as an aid to colony size estimation.

All data will be summarized and presented in the final report in graphical and/or tabular form. Appropriate statistical techniques will be used to identify specific habitat characteristic of preferred beaver habitat.

TIME SCHEDULE

Work will be conducted according to the following schedule:

May 25 - June 15	Preliminary reconnaissance and location of beaver colonies.
June 15 - August 20	Habitat sampling and behavioral observations; preparation of field maps of active colony sites; collection of soil samples.
September 1 - November 1	Data summarization and analysis; completion of first draft.
November 1 - December 20	Completion and submission of final report.

DATA SHEET

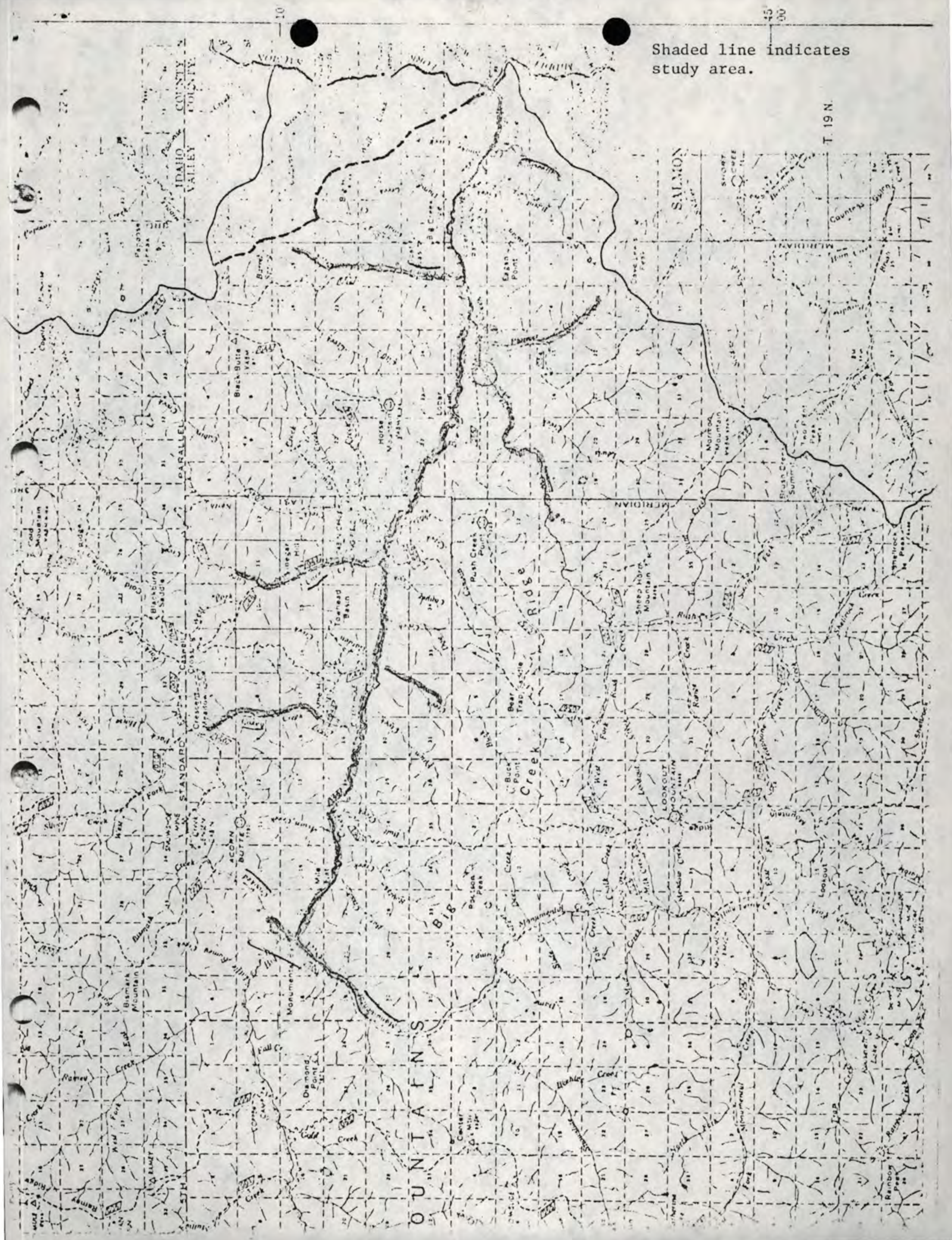
DATE _____ MAX. CUT. DIST. _____

OBSERVER _____ STREAM WIDTH _____ STREAM DEPTH _____

LOCATION _____ COLONY NO. _____ STREAM VELOCITY _____ GRAD _____

SIDE OF STREAM _____ STREAM TEMP. _____ BANK SLOPE _____

TRANSECT	SUB PLOT	TREES			SHRUBS		FORBS	
		SPECIES	DIAM.	CUT/UNCUT	SPECIES	% COVER	SPECIES	% COVER



Shaded line indicates study area.

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