ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

ENVIRONMENTAL STUDIES PROCEDURES MANUAL

SUBTASK 7.11
WILDLIFE ECOLOGY-
FURBEARERS

Terrestrial Environmental Specialists, Inc.

ALASKA POWER AUTHORITY

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WILDLIFE ECOLOGY-
FURBEARERS

Submitted by

Terrestrial Environmental Specialists, Inc.

and

Alaska Cooperative Wildlife Research Unit
University of Alaska-Fairbanks

to

Acres American, Inc.

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PROCEDURES MANUAL

SUBTASK 7.11, WILDLIFE/FURBEARERS

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I. INTRODUCTION

The objectives of Phase I furbearer studies are to determine the probable impacts of the proposed Susitna Hydroelectric Project upon the following species: red fox, Vulpes fulva; coyote, Canis latrans; lynx, Lynx canadensis; mink, Mustela vison; pine marten, Martes americana; river otter, Lutra canadensis; short-tailed weasel, Mustela erminea; least weasel, Mustela rixosa; muskrat, Ondatra zibethica and beaver, Castor canadensis.

Specific objectives for Phase I are as follows:

1. Determine general abundance of each species in the study area.
2. Assess habitat preferences of each species.
3. Analyze seasonal use of habitats and degree and type of utilization of habitats for each species.
4. Project the probable impacts of the proposed development on each species.
   a. Assess likely changes in habitats from the proposed action.
   b. Project changes in abundance of furbearers in response to habitat changes.
   c. Predict other, non-habitat related impacts upon furbearers.

II. TECHNICAL PROCEDURES

For the purposes of Phase I studies, the study area is defined as the proposed impoundment zones, all land and water within 8 horizontal miles of the impoundment zones and the downstream floodplain as far as Gold Creek and within 3 horizontal miles of the river.

Data will be gathered from three principal sources.

A. Snow Transect Data

Transects will be established and utilized in four major physiographic types. These types are listed below, with the corresponding local study site:

1. Upland bench. Deadman-Tsusena bench, Figure 1 and 2.
2. Canyon walls. Watana damsite area (Figure 1, and to be established).
3. Creek bottoms. Watana Creek, Tsusena Creek, Figure 2.
4. Downstream floodplain. Portage Creek, Gold Creek, (to be established).

Transects will be numbered and marked on topographic maps to be kept on file. Transects will be run by snowmachine, skis or snowshoes, depending upon terrain. When the track

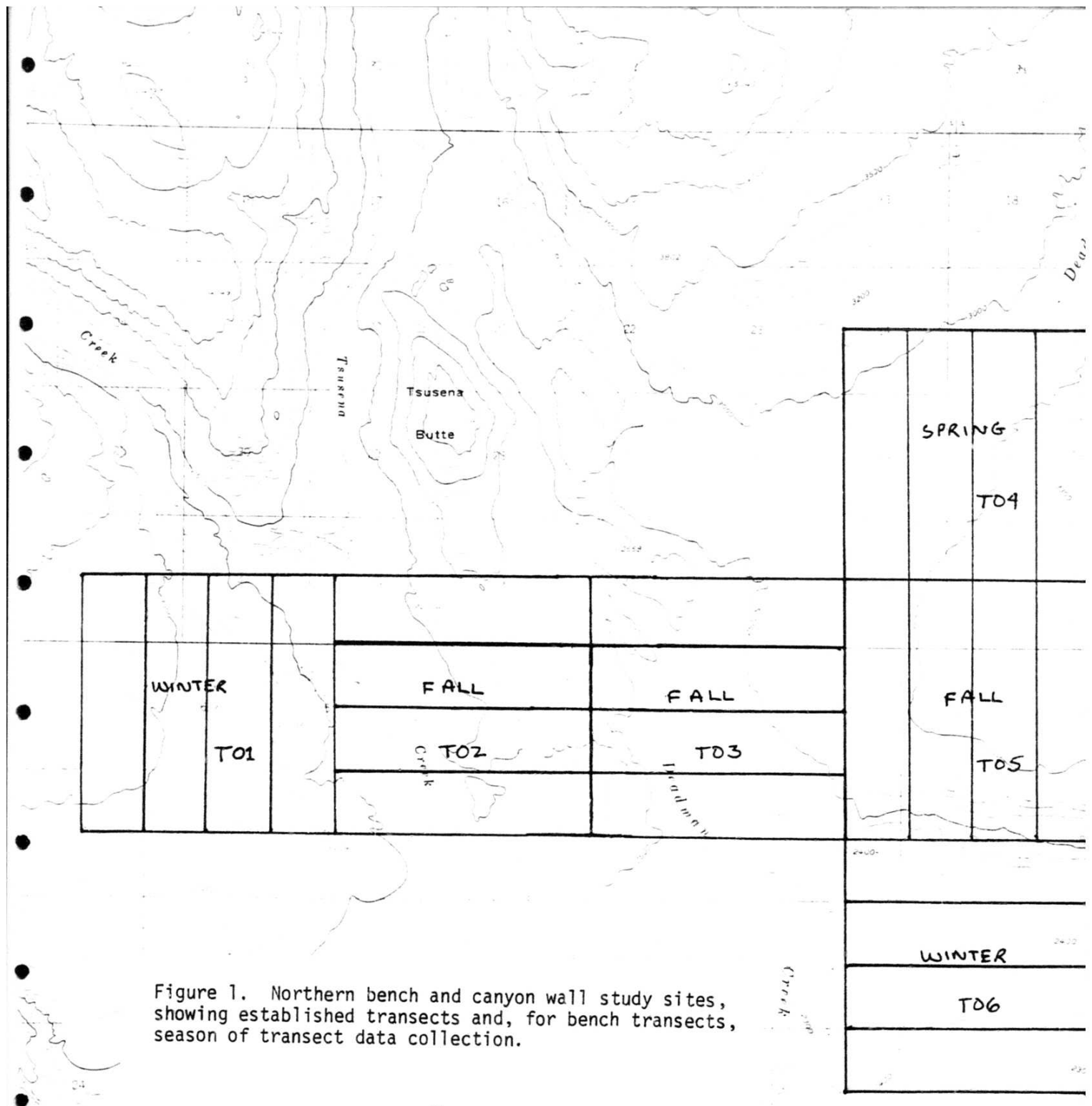
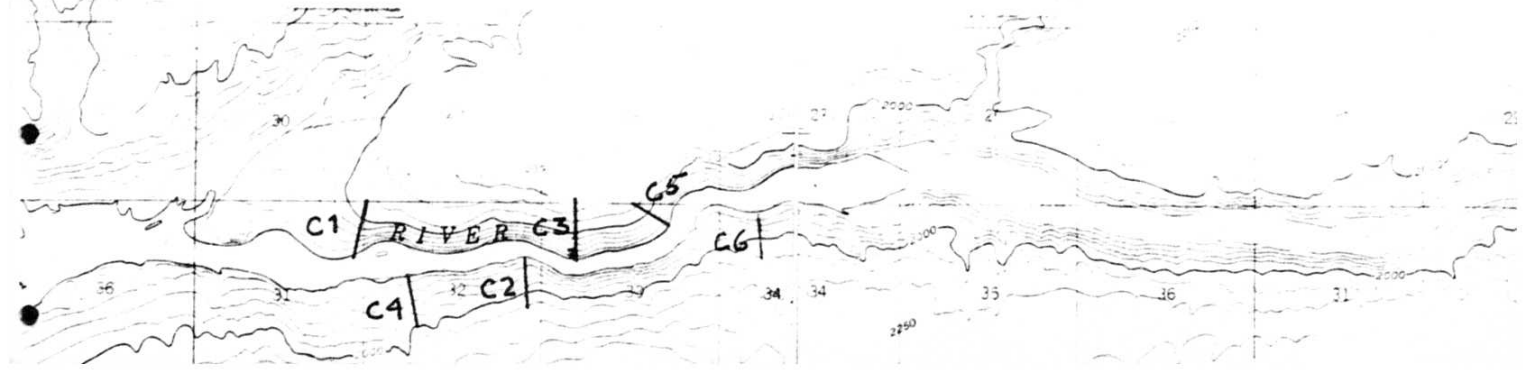


Figure 1. Northern bench and canyon wall study sites, showing established transects and, for bench transects, season of transect data collection.



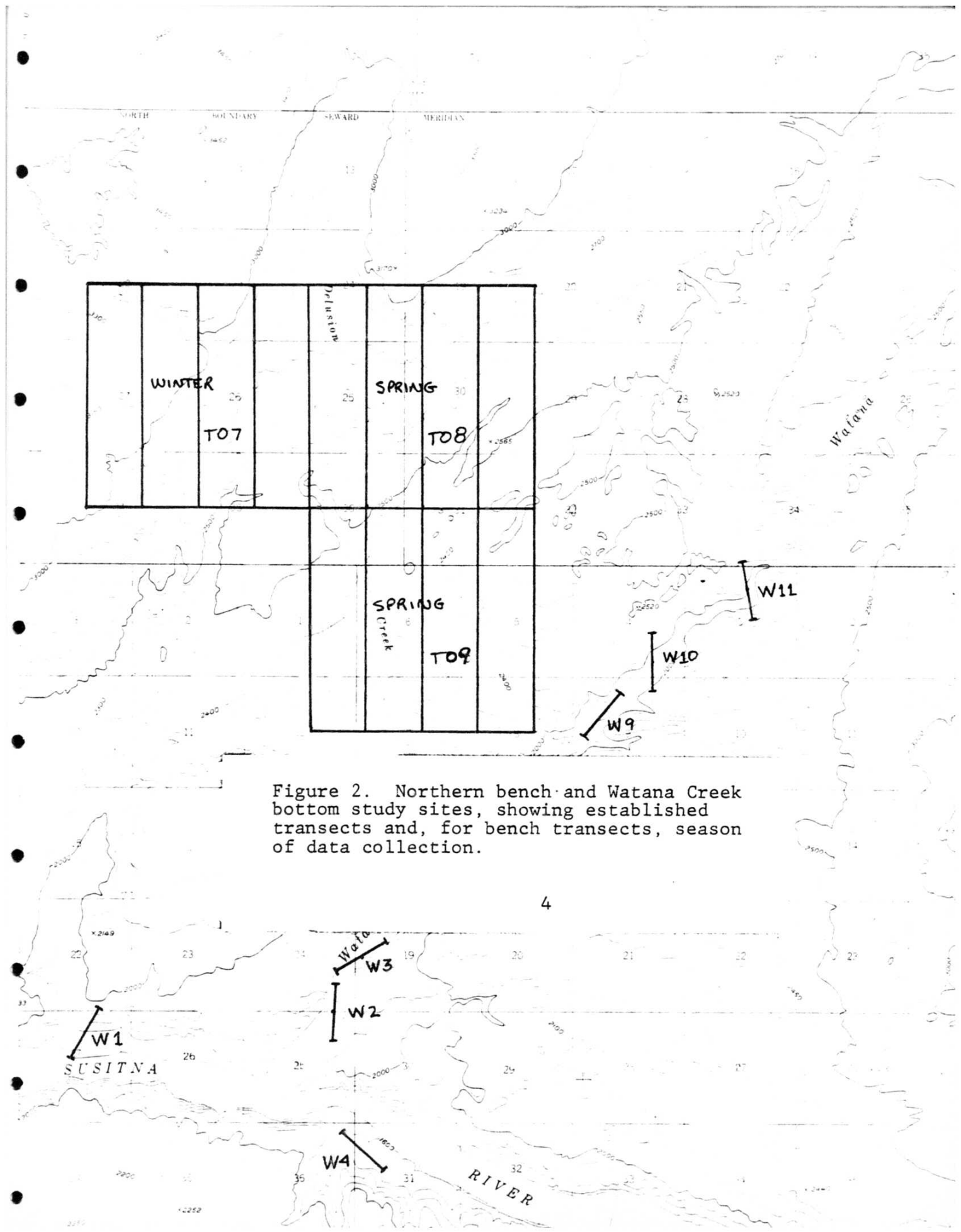


Figure 2. Northern bench and Watana Creek bottom study sites, showing established transects and, for bench transects, season of data collection.

of a subject animal is encountered, the following data will be recorded:

1. Species of animal
2. Vegetation type to Viereck level III or IV
3. % canopy cover (45° cone)
4. Distance to water (not frozen)
5. Water type (lacustrine, riverine, etc.)
6. Snow depth at the first track on either side of the transect (2 measurements)
7. Snow hardness, top 2 inches
8. Estimated age of tracks
9. Slope
10. Aspect
11. Elevation (MSL)
12. Physiographic type (2 levels of resolution)
13. Number of hare tracks within 10 m of intersection
14. Number of ptarmigan tracks within 10 m of intersection
15. Number of red squirrel tracks within 10 m of intersection

Note: For the purposes of Nos. 13-15, a track is the group of marks made by an individual animal entering the 10 m circle once. See Figure 3.

B. Snow Tracking

Snow trails of individual subject animals will be located by the following techniques. On each of the established and proposed transects, points will be chosen by selecting random distances from the beginning. A random number table will be employed. After this point is chosen, a random magnetic compass bearing will be chosen (increments of 10°) with a random number table and that bearing followed until the trail of the furbearer of interest is intersected. This trail will be followed in each direction until the trail is lost or 25 sampling points have been reached. The sampling points will be at fixed distances, by species as follows:

Red Fox	500 meters
Coyote	500 meters
Lynx	500 meters
Pine Marten	100 meters
Mink	30 meters
River Otter	30 meters
Short-Tailed Weasel	30 meters
Least Weasel	30 meters

At these sampling points the trail will be sampled for the parameters measured on snow transects (see "A" above).

Additionally, an index to snow hardness will be obtained by measuring the depth of 3 foot prints at each sample point when following the trail of an individual animal. Foot print depth and penetrometer readings will be compared for each sample point. Along transects, penetrometer readings

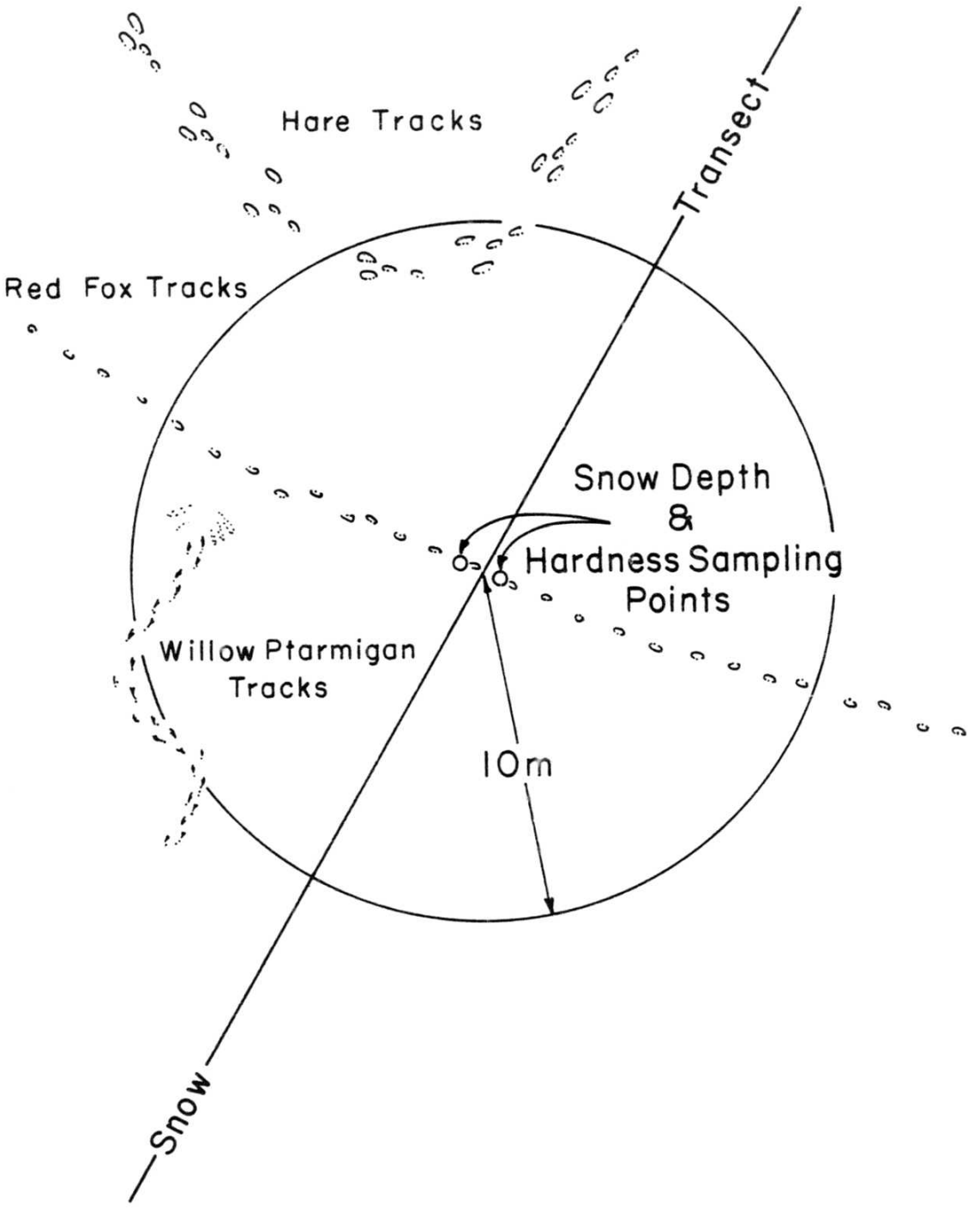


Figure 3. Snow transect intersection with red fox trail. For this data collection point one hare track and two willow ptarmigan tracks would be recorded.

will be taken every 500 m as well as other parameters required on the transect data sheet. Snow tracking will be conducted for 2 weeks out of each 8 week sampling period provided at least one inch of new snow has fallen since previous tracking effort.

C. Radio Telemetry

Limited telemetry studies will be conducted on foxes, pine martens, mink and short-tailed weasels. Radio location data will be gathered to determine home range size and shape and daily and seasonal movement patterns and to locate den sites and scats. Home range will be determined using the minimum area technique and computer programs available at the University of Alaska, Fairbanks. Radio transmitters will be placed on the following species in sufficient numbers to obtain the following numbers of working collars:

Red Fox	10
Pine Marten	12
Mink	4
Short-Tailed Weasel	8

Animals will be collared in representative habitats in the Susitna study area. Where possible, family groups will be collared. Transmitters will be manufactured by AVM Instrument Co., 3101 West Clark Road, Champaign, IL 61820 and operate in the 164.000 to 164.900 MHz band.

D. Miscellaneous

In the course of live trapping for radio collaring, scats will be secured from traps. Scats will be dried and stored and analyzed for species of food items using dissecting microscopes. Reference collections of seeds and mammal hairs and bones are available at the University of Alaska. Scats will be characterized as to percent frequency occurrence of food items and used to indicate seasonal and habitat-specific food preferences. Information on past furbearer numbers will be sought from individuals who have trapped in and near the study area in the past. Carcasses will be procured from trappers operating near the Susitna River. Information on fox den sites may be available from other Acres team members. Track identification is a subjective and subtle skill, for which few references exist. The principal one is Murie (1954). Snow depth will be measured to the nearest centimeter with a meter stick. Snow hardness will be measured with a recording spring penetrometer, which is being custom manufactured in Sweden (Olof Erickson, Vaxtbrologiska Institutionen, Villavagen 14, Box 559, S 751 Uppsala, Sweden). Survey of muskrat pushups and beaver structures will be conducted at breakup time in spring of each year. A helicopter will be used to examine lakes, ponds and marshy areas at a time when snow is nearly absent from lake ice, yet the ice is not yet melted. Pushups on lakes will be counted and beaver dams and lodges recorded on 1:63,360 scale maps. In spring of each

year aerial surveys will be conducted of furbearer sign along the Susitna River between Gold Creek and the mouth of the Chulitna River. Data will be gathered on species occurrence, using tracks and other sign as indicators of presence.

III. DATA PROCEDURES

Draft data recording sheet for snow transect data is attached (Figure 4).

Parametric and nonparametric analyses will be made of movement data, animal-habitat associations and projections of probable impact. Statistical programs available in SPSS (Nie, et al. 1975) and BMDP (Brown 1977) will be utilized as well as programs being developed specifically for data generated during this investigation. Drs. Samuel Harbo and Edward Murphy are assisting in formulation of appropriate methods of compiling, summarizing and analyzing data.

IV. QUALITY CONTROL

A. Data

Data will be stored in the following manner:

1. Directly on field data sheets.
2. Computer tape - to be stored in Irving Building, UAF.
3. Disc files in main computer center, Bunnell Building, UAF.

B. Equipment

Equipment verification will be as follows:

1. Telemetry

Field tests will be made in which transmitters are placed at known locations to determine accuracy of portable ground-to-ground antennas and aerial tracking systems. The accuracy and precision of computer programs designed to plot telemetry data will be checked by direct comparison with manually prepared plots of locations.

2. Snow Hardness

Accuracy of penetrometer will be checked on a spring scale.

C. Output

Output accuracy of computer programs will be determined by comparison with calculations generated

TRANSECT DATA SHEET

TRANSECT NO. _____ CENTER _____

STUDY AREA _____ BEARING _____

DATE _____ OBSVR _____

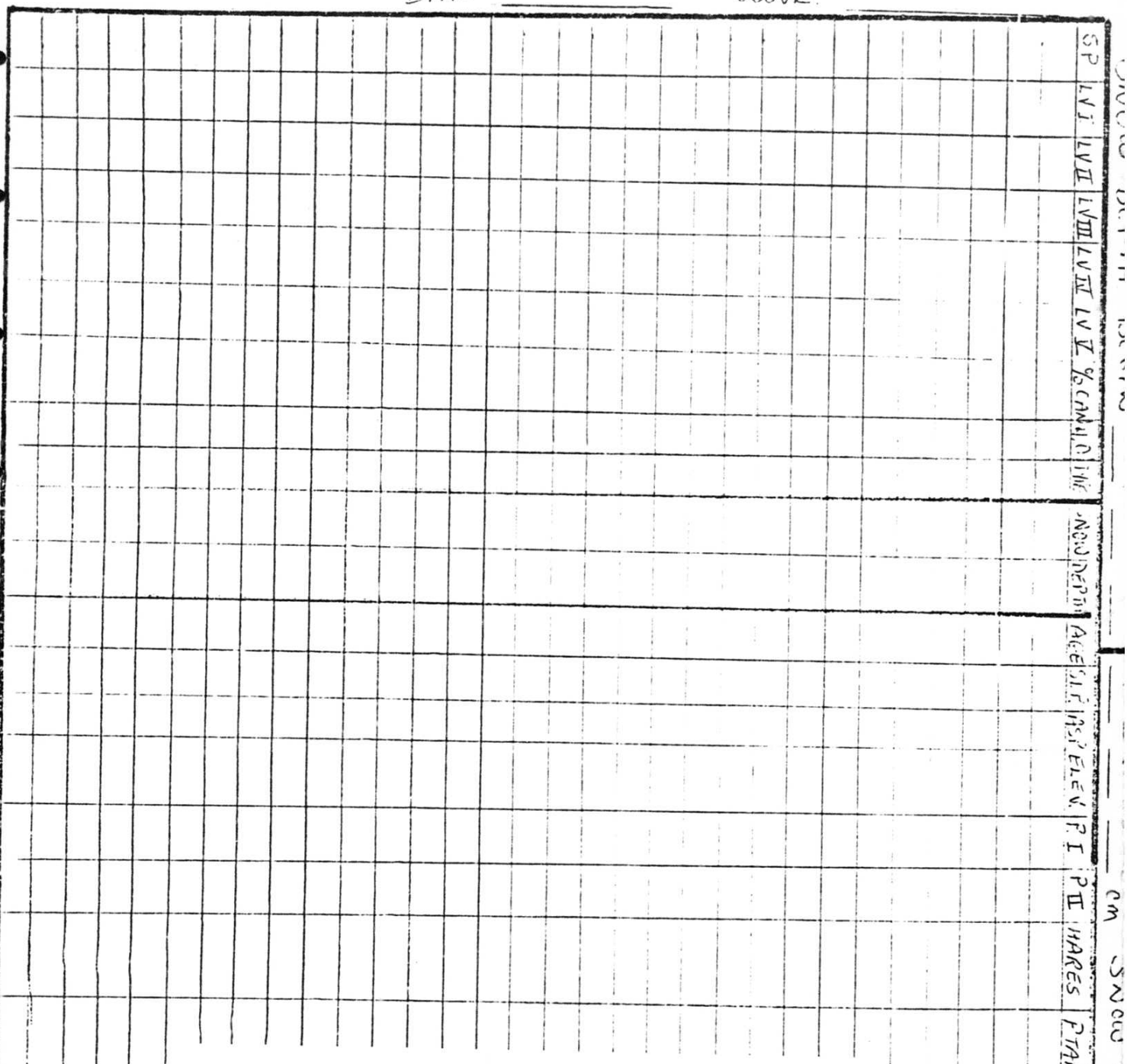


Figure 4. Sample snow transect data collection sheet.

with a desk calculator. Plots of radio telemetry locations will be compared to plots prepared manually.

D. Transcription of Data

Transcription of data from one form to another and to computer data files will be checked for accuracy by a second investigator.

E. Data Collection

Data collection biases due to differences in the ability of workers to identify and interpret field signs will be minimized by continuous mutual checks in the field. Biases should be held to a minimum in this manner.

V. SCHEDULE

Copy attached (Figure 5)

VI. PERSONNEL

Key personnel of the furbearer studies group are as follows:

Principal Investigator: Dr. Phillip S. Gipson
Assistant Leader
Alaska Cooperative Wildlife Research Unit
University of Alaska
Fairbanks, Alaska 99701

Qualification of Principal Investigator. Extensive experience supervising research projects under remote field conditions. Established scientific standing as evidenced by publications describing the results of independent research. Ability to formulate, supervise and prepare reports treating ecological studies of northern mammals.

Project Investigators: Mr. Steven W. Buskirk
Graduate Fellow
Alaska Cooperative Wildlife Research Unit
University of Alaska
Fairbanks, Alaska 99701

Mr. T. Winston Hobgood
Graduate Fellow
Alaska Cooperative Wildlife Research Unit
University of Alaska
Fairbanks, Alaska 99701

Qualifications of Project Investigators. Experience conducting field research projects under remote conditions. Minimum of bachelor's degree in biological sciences or related field. Ability to carry out field research and prepare reports of results.

Group Leader: Edward T. Reed
Environmental Scientist
Terrestrial Environmental Specialists, Inc.
Phoenix, New York 13135

Qualifications of Group Leader.
Six years of experience evaluating project impacts on wildlife populations.

ACTIVITY	1980												1981												1982					
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
Literature Review	X	X	X	X	X	X																								
Field Sampling		X		X	X		X	X	X	X	X			X	X	X		X		X	X	X								
Data Analysis												X	X										X	X	X					
Report Preparation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X		X		
Reports Due to TES						X		X							X						X					X				

Figure 5. Schedule.

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Murie, O. J. 1954. A Field Guide to Animal Tracks. Boston: Houghton Mifflin Co., 374 pp.

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