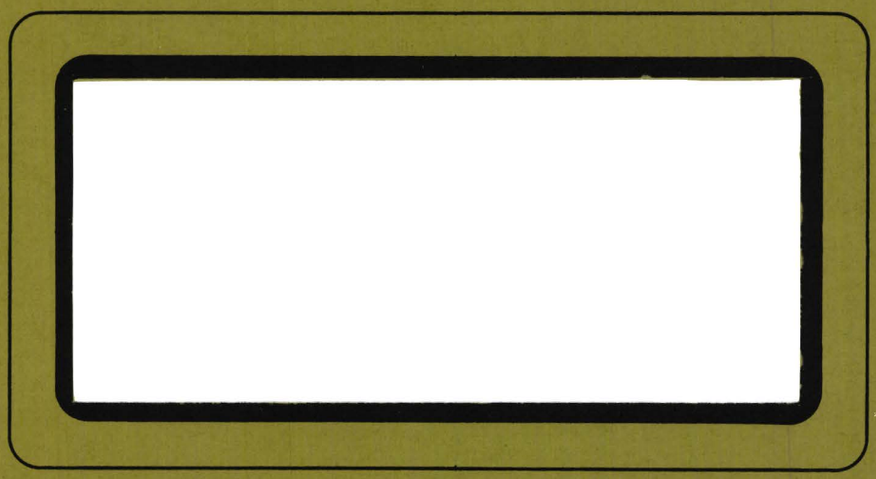

CURRENT POPULATION STATUS
OF
BLACK BEAR, GRIZZLY BEAR, COUGAR and WOLF
IN THE
SKAGIT RIVER WATERSHED

BY

TONY BARNARD

FOR

MINISTRY OF ENVIRONMENT

AUGUST, 1986

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1.0 INTRODUCTION

In January, 1986 the Fish and Wildlife Branch submitted a request for funding of certain wildlife studies in the Skagit River watershed to the Skagit Environmental Endowment Commission (Barnard, 1986). Among these was a proposal to assess the current population status of a selected group of carnivores including grizzly bear (Ursus arctos horribilis), black bear (Ursus americanus altifrontalis), cougar (Felis concolor) and wolf (Canis lupus). Subsequent approval of funding has enabled this study to proceed.

In total, that portion of Manning Provincial Park within the study area and the Skagit Valley Recreational Area (S.V.R.A.) comprise approximately two-thirds of the watershed area (Fig.1). As recreational use of these areas increases so may the potential for interaction with these four species of carnivores. Therefore, from the standpoint of human safety, it is important to gain an appreciation of the frequency of occurrence of each species. Additionally, knowledge of the potential impact that these predators represent on other forms of wildlife in the watershed, notably deer, is intergral to the successful management of those species also (Fig 2).

2.0 STUDY AREA DESCRIPTION

The Skagit River watershed is located in southwestern British Columbia, approximately 150 km east of Vancouver (Fig.1). Straddling the International Boundary, the entire watershed encompasses approximately 8133 km^2 of which some 1036 km^2 are situated in British Columbia (Whately, 1979). The Canadian portion contains an array of physiographic features including the ecotone between coastal and interior forest types (Perry, 1981). This diversity is reflected in the six biogeoclimatic zones that occur within the watershed: 1) Alpine Tundra and Mountain Hemlock 2) Alpine Tundra and Englemann Spruce-Subalpine Fir 3) Mountain Hemlock 4) Englemen Spruce-Subalpine Fir 5) Coastal Western Hemlock and 6) Interior Douglas Fir (Barnard, 1986).

A diversity of land uses have occurred in the watershed, some of which are still active today. Since early times portions of the watershed have served as a travel corridor linking the Interior with the coast, first for native Indians and subsequently for fur traders and gold miners (Perry, 1981). Today that link continues in the form of the Hope-Princeton Highway (Hwy. 3). The discovery of gold in 1859 led to attempts at mining in the watershed. Since then sporadic attempts at

Figure 1

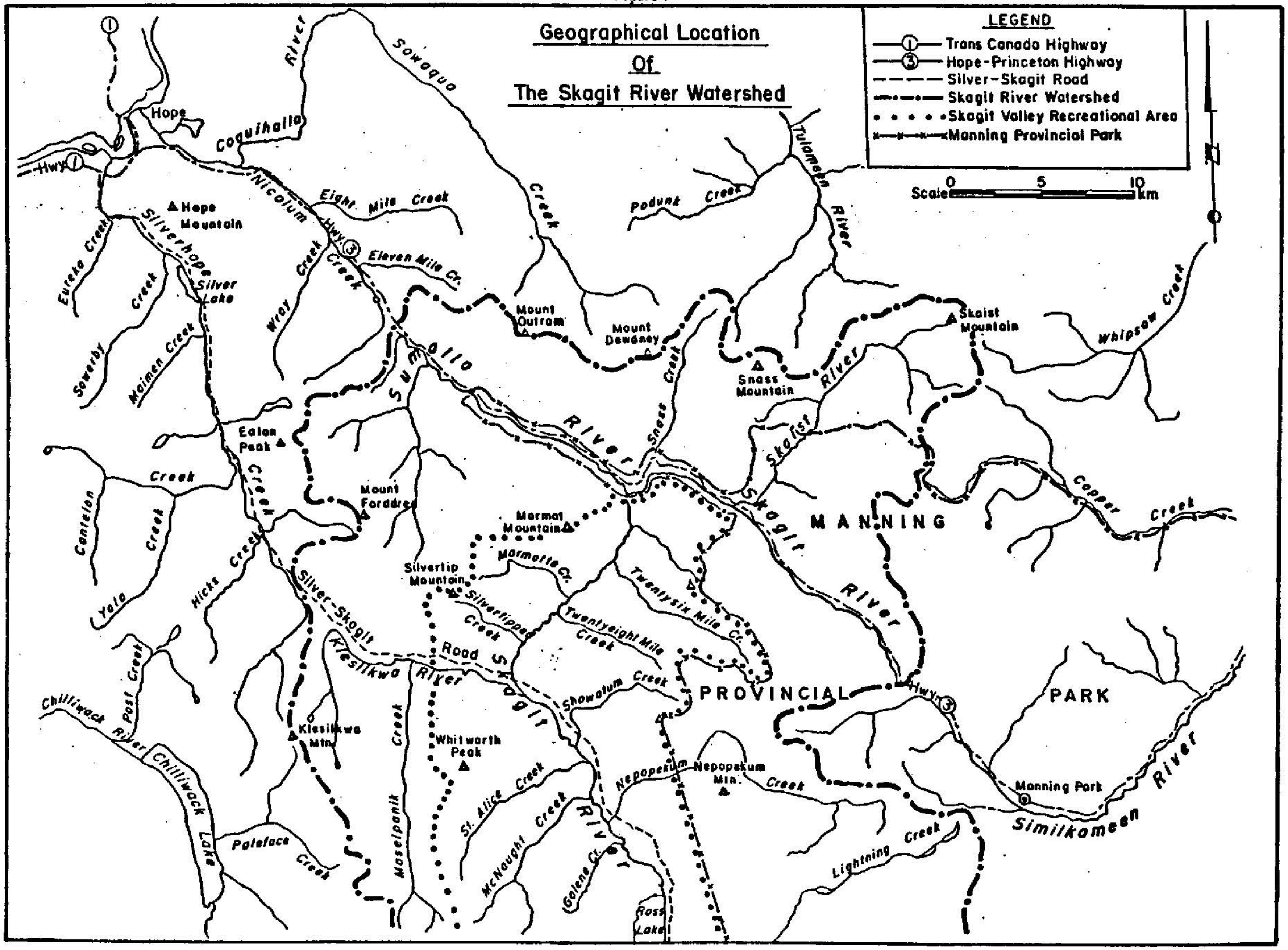

Geographical Location
Of
The Skagit River Watershed
LEGEND
Trans Canada Highway
Hope-Princeton Highway
Silver-Skagit Road
Skagit River Watershed
Skagit Valley Recreational Area
Manning Provincial Park
Scale 0 5 10 km
N
Hope
Hwy 1
Coquihalla River
Sowaqua Creek
Nicolum Creek
Eight Mile Creek
Hwy 3
Eleven Mile Cr.
Podunk Creek
Tulameen River
Hope Mountain
Silverhope Creek
Silver Lake
Eureka Creek
Wray Creek
Sowerby Creek
Maimen Creek
Mount Outram
Mount Dewdney
Snass Creek
Snass Mountain
Skaist Mountain
Skaist River
Whipsaw Creek
Sumallo River
Eaton Peak
Mount Forddred
Marmot Mountain
Silvertip Mountain
Marmotte Cr.
Silvertipped Creek
Twentysix Mile Cr.
Twentyeight Mile Creek
Skagit River
Copper Creek
MANNING
PROVINCIAL
PARK
Hwy 3
Cantelon Creek
Yola Creek
Hicks Creek
Silver-Skagit Road
Klesilkwa River
Klesilkwa Mtn.
Post Creek
Chilliwack River
Chilliwack Lake
Paleface Creek
Maselpanik Creek
Whitworth Peak
St. Alice Creek
McNaught Creek
Showalum Creek
Nepopekum Creek
Nepopekum Mtn.
Galene Cr.
Ross Lake
Lightning Creek
Manning Park
Similkameen River

Figure 2. Deer Fawns Can Be Preyed Upon by Foraging Black Bears in the Spring.

--photo credit - E. Buckle

mineral extraction have continued. In the late 1800's and early 1900's several attempts were made to establish ranching operations in the Lower Skagit Valley. However, by 1910 the last of these attempts had failed. In the late 1930's and early 1940's construction and subsequent modification of the Ross Dam approximately 48 km below the International Boundary resulted in the creation of Ross Lake Reservoir. At full pool the reservoir inundates approximately 200 ha of the Lower Skagit Valley (Slaney, 1973). Between 1946 and 1954 most of the valley floor was clear-cut or selectively logged and has been followed by a climate-induced period of relatively slow regeneration.

Today, forest harvesting activities are the predominant form of land use, primarly in the Maselpanik, Klesilkwa, Cantelon, Yola and Sumallo drainages. No logging is permitted in that portion of the watershed within Manning Provincial Park. Additionally, future forest harvesting activities in the 32781 ha Skagit Valley Recreational Area (S.V.R.A.) will only be permitted if compatible with other resource users. This reflects recognition of the increasing role of recreation in the area generally, and in the southeast portion of the watershed in particular.

Administratively, the study area is located in Resource Management Region 2. Within that region the watershed occupies approximately the southern half of wildlife management unit (M.U.) 2-2.

3.0 METHODS

A review of Ministry of Environment regional office files was undertaken to determine existing data availability re status of black bear, grizzly bear, cougar and wolf in the watershed. Documents examined included species statements, unpublished reports and various pertinent correspondence. Previously reported sightings of grizzly bear and wolf in, and immediately adjacent to, the study area were also compiled. Sighting records of the more common black bear and cougar are not maintained by the Ministry.

Wherever possible, the individual reporting each occurrence was interviewed to determine report reliability. The criteria used to determine reliability were subjective, and depended primarily on the writer's assessment of the familiarity of the source with local wildlife in general and the species in question in particular. Degree of reliability was assigned on the basis of three categories: 1) confirmed 2) probable and 3) unknown. Unfortunately, due to the passage of time and/or difficulty in tracing the observer, some sightings already on file could not be verified.

Additional sightings were actively pursued via phone interviews, personal interviews and letter (Appendix 1). Potential sources contacted included individuals, organizations and government agencies (Appendix 2). A final source of data for grizzly bear and wolf were those sightings that have been recorded in and adjacent to the U.S. portion of the Skagit watershed by staff of the North Cascades National Park (Appendix 3). Both species have the capability to range widely and probably do so throughout the entire watershed irrespective of the International Boundary. Therefore, although technically outside the study area, it is felt that inclusion of the distribution of these U.S. sightings helps to put similar data for the Canadian portion of the Skagit watershed into perspective.

All study area sightings were compiled, by species, into a table format. A map of the study and, where applicable, adjacent area showing the distribution of sightings was then prepared for cougar, wolf and grizzly bear. Finally, additional data on the cougar population was solicited by interviewing individuals who regularly hunt this species in the study area.

4.0 RESULTS AND DISCUSSION

4.1 Black Bear

During the period 1970-86 four estimates of the black bear population status within the study area were made (Gates and Caverhill, 1970; Slaney, 1973; Blood, 1985; Barnard, 1986). The 1970 study was restricted to that portion of the Lower Skagit Valley below 914 m elevation and encompassed approximately 76.89 km^2. Based on harvest data an estimated minimum population of 35-40 black bear were estimated to inhabit that area (Gates & Caverhill, 1970). Population density estimates for that population range would be 46-52 bears/100 km^2. Slaney (1973) subsequently estimated a population of 30-50 bears for the same area based on field sightings and hunter road checks. This is equivalent to a population density of 39-65 bears/ 100 km^2. Approximately 16 percent of the area evaluated by these two studies is valley bottomland and bears congregate in such areas in the spring (Slaney, 1973). Both studies noted the importance of the valley bottom as spring habitat but did not indicate clearly whether their respective population estimates were based primarly on bear numbers occurring at that time.

Blood (1985) estimated black bear populations in four Region 2 management units including M.U. 2-2. Approximately 53.5 percent of the Skagit watershed occurs within M.U. 2-2. His analyses was based on establishing a range of estimated bear population densities from studies conducted elsewhere in the Pacific Northwest. These were then adjusted for applicability

to the M.U. being studied. The amount of bear habitat in each M.U., based on watershed units, was calculated and adjusted to reflect quality of habitat. Based on this approach, the bear population for 53.5 percent of the Skagit watershed was calculated at 108 animals based on an estimated population density of 23 bears/100 km (Blood, 1985). The author also noted that he believed these estimates to be conservative.

Blood's estimates were much more refined than those arrived at in 1970 and 1973. However, as noted by the author, they were subject to two paramount considerations. The first was that the studies from which the bear density estimates for the 1985 study were derived may have been carried out in habitats that were better than average for the general regions in which they occurred. Secondly, the climate and vegetation characteristics of those study areas were, with one exception, mostly dissimilar to that occurring in Blood's study area.

Barnard (1986) extrapolated Blood's data to include the entire Skagit watershed. This analyses estimated a population of 150 bears. based on an estimated 650 km of bear habitat. However, this latter figure assumed that only 184 km of the 485 km of the watershed not included in Blood's original calculations was viable bear habitat. That estimate may be too conservative and would, therefore, underestimate the population level. This approach also is subject to the two considerations inherent in Blood's approach.

In the final analyses none of the population estimates arrived at to date are based on sound field data collected throughout the Skagit watershed. Until such data are available the 1986 estimate of 150 bears for the entire watershed would seem logical, keeping in mind the constraints discussed earlier. Utilizing the 25 percent limits suggested in Blood's 1985 study the population range would be 113-188 bears.

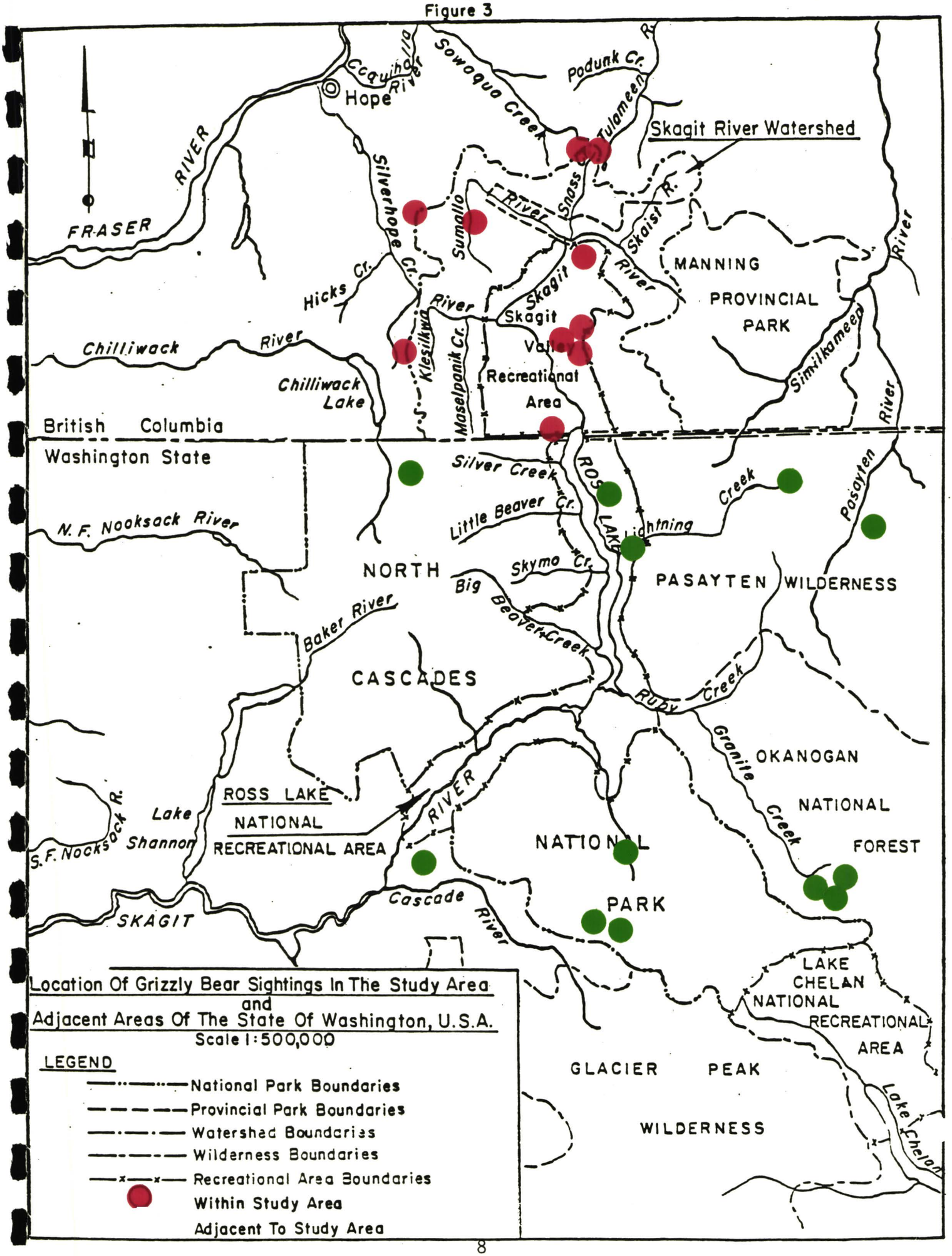
4.2 Grizzly Bear

Ten sightings of grizzly bears, spanning the period 1972-85, were documented for the study area (Table 1). The location of each sighting is indicated on Figure 3. Three of the sightings (Mt. Dewdney, Eaton Lake and Silverhope Creek drainage) were located on the watershed boundary; however, they were included due to the animal's wideranging tendencies (Jonkel, 1980). These would probably result in the bears involved in those sighting spending at least a portion of their time within the study area. Due in part to the same wide-ranging tendencies, recent sightings of grizzly bears in, and adjacent to, the U.S. portion of the Skagit watershed were also solicited. A total

TABLE I GRIZZLY BEAR SIGHTINGS WITHIN THE SKAGIT RIVER WATERSHED - 1972-85.

Date	Location	Details	Observer	Status
1969	Boundary Meadows-headwaters of Galene Creek	single unclassified bear	Jack DeLair	confirmed
1972-73	Shawatum Mtn.	single unclassified bear	Jack DeLair	confirmed
Aug, 1977	Silverhope Creek drainage	observed on several occasions during logging road construction, but disappeared after road completed	Larry Unger	probable
1982	Lower slopes of Shawatum Mtn.	single unclassified bear	Chuck Chestnut	confirmed
1983	Vicinity of Eaton Lake	sow and two cubs	Kay Keding	confirmed
1983	Sumallo River drainage	reported to District C.O. (K. Keding) by D. of H. grader operator	unknown	probable
Summer, 1984	N. slope of Mt. Dewdney and on divide between Skagit and Tulameen drainages	single unclassified animal observed twice - not known if same animal	Chuck Chestnut	confirmed
1984	Silverdaisy Mountain	observed by District Conservation Officer	Kay Keding	confirmed
1985	Shawatum Mtn.	observed by fire fighting crew	Al Bond	probable
Sept., 1985	N. slope of Mt. Dewdney	single unclassified bear	Chuck Chestnut	confirmed

Figure 3



Location Of Grizzly Bear Sightings In The Study Area and Adjacent Areas Of The State Of Washington, U.S.A.
Scale 1:500,000

LEGEND

- National Park Boundaries
- Provincial Park Boundaries
- Watershed Boundaries
- Wilderness Boundaries
- Recreational Area Boundaries
- Within Study Area
- Adjacent To Study Area

of 13 recorded during the period 1969-85 were obtained from the U.S. National Parks Service (Appendix 3). The locations of these sightings are also indicated in Figure 3. Obviously not all of these bears utilize all or a portion of the study area. However, their distribution relative to the study area helps put sightings within that area into perspective.

Historically, the earliest reference to grizzly bears in the study area was prior to 1949 in the Snass Creek drainage (Carl et al, 1952). However, in 1859, five grizzlies were sighted, and one killed, at Tomyhoi Lake in the adjacent Chilliwack Lake drainage (Mason, 1986). Numerous other records for the late 1800's and early 1900's have been documented for the North Cascades National Park Complex and surrounding area (Mason, 1986). Based on the frequency and distribution of those sightings it is not unreasonable to assume that grizzlies also occurred in the study area during the same period. In 1949 tracks and scats of grizzlies were observed in the headwaters of Silverdaisy Creek (Carl et al, 1952). In the late 1940's or early 1950's grizzly bears were reported regularly in the high country of Shawatum Mountain and seasonally ranged across the floor of the upper Skagit Valley (Mason, 1986).

Based on the sightings documented for the period 1972-85 grizzly bears still inhabit the study area. However, they appear restricted in distribution to those portions of the watershed that are still relatively inaccessible to man. Given this restriction and the relatively small area it represents it is unlikely that more than 3-5 grizzly bears utilize all or a portion of the Skagit River watershed annually.

4.3 Cougar

Aside from human pressures cougar distribution generally seems to be influenced by either dense vegetation or rugged terrain and the concentration of prey species, primarily deer (Odocoileus hemionus)(Nowak, 1976). Dense cover and rugged terrain occur throughout the study area. However, concentrations of deer, particulary during the fall, winter and spring are primarily associated with the Lower Skagit and Klesilkwa Valleys (Forbes - personal communication). Therefore, it is reasonable to assume that the density of cougar in the study area is greatest in these areas. This appears recognized by cougar hunters, some of whom consider the Lower Skagit Valley the prime cougar hunting area in the Lower Fraser Valley (Stephens - personal communication) (Figure 4). Indications of a consistent cougar presence in these areas may also be reflected in the sightings documented in this study (Table 2). Eight

Figure 4. A Successful Cougar Hunt in the Lower Skagit Valley--Winter, 1976-77.

--photo credit - E. Buckle

of the nine sightings were in, or immediately adjacent to, the Lower Skagit and Klesilkwa Valleys (Fig. 5). Of these seven had occurred during the period May-July of this year. Cougars are very secretive and are rarely sighted by casual observers (Forbes, 1980). Therefore, even though some repeat sightings of the same animal may have occurred, the total does suggest a definite cougar presence in that area.

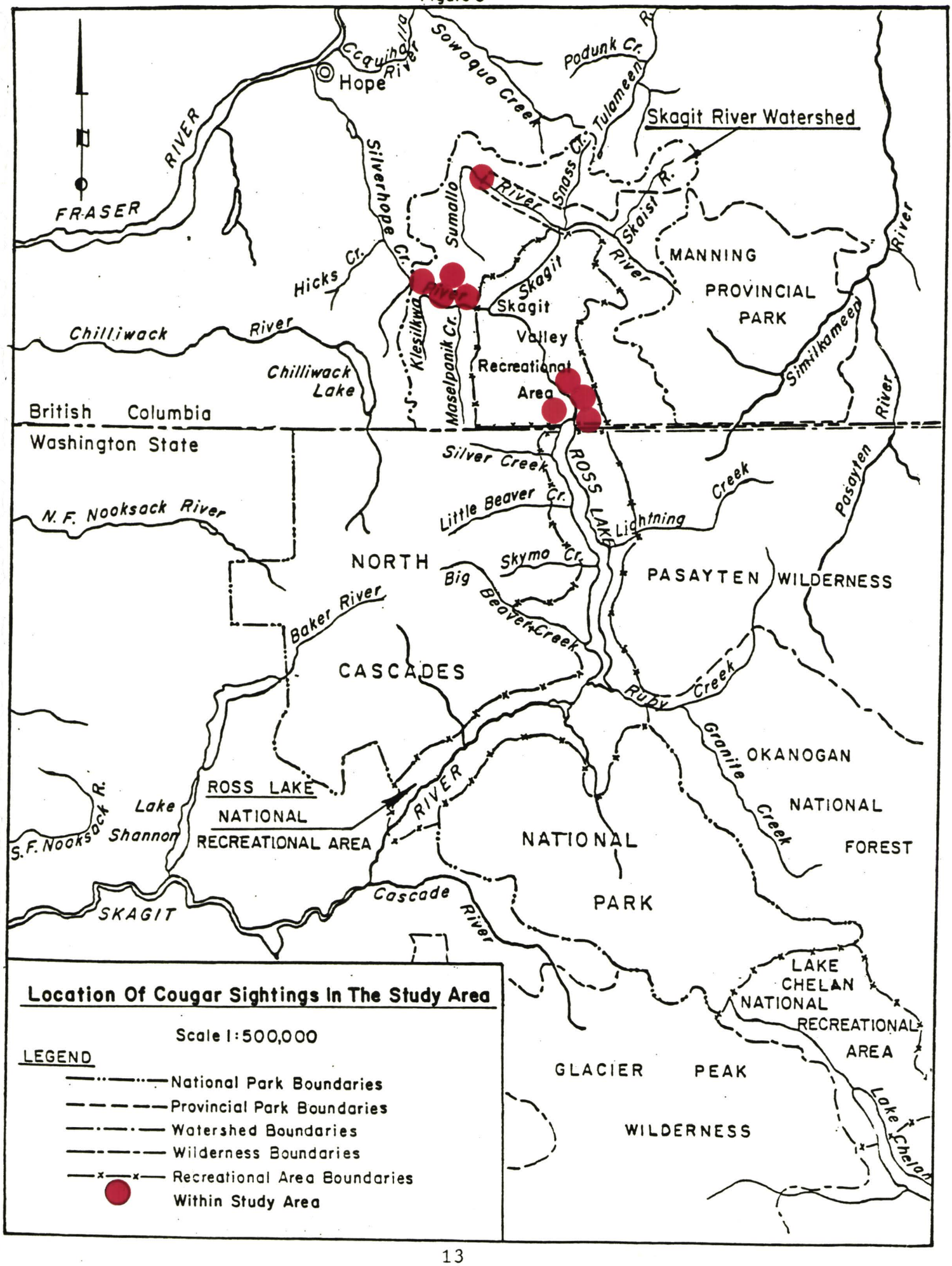
Cougars are territorial and travel widely, moving in a rough circle, and therefore require a very large area (Buckle-personal communication). The usual area of activity for established residence is about 40-80 km^2 (15-31 sq. mi.) for females and about 65-90 km^2 (25-35 sq. mi.) for males but may vary greatly (Russell, 1980). Generally, summer ranges are smaller than winter ranges. Cougar utilzing the Lower Skagit and Klesilkwa Valleys appear to be transitory (Stephens - personal communication). They move in an east-west and west-east direction but are not consistent in these movements (Buckle-personal communication). Often during the winter there will be periods of up to 2 weeks when no sign is apparent and then a number will cross the valleys. Crossings are often at the narrowest points in the valley and reflects the cougar's practice of following ridges while travelling (Buckle - personal communication). Although several beaver (Castor canadensis) kills have been found it is thought that cougar are primarily preying on deer in the study area. One cougar hunter, who estimates he has taken 14-16 animals in the area over a 25 year period, consistently opens the animal's stomach to check on food habits (Buckle-personal communication). Of the total, two contained mountain goat hair (Oreamnos americanus); two-thirds of the remainder contained deer and the balance were empty. This agrees generally with cougar food habit studies conducted elsewhere that revealed about 25 percent of the stomachs were empty (Russell, 1980).

Cougars are extremely wary and tend to inhabit dense vegetation cover and rocky mountainous terrain (Goodchild et al, 1980). As a result, determination of population status is difficult unless studies involving capturing and radio-tagging are conducted. All population status estimates in the study area, to date, have been based primarily on track counts, sign, and individual sightings. Using this approach, an earlier study estimated the population level in the Lower Skagit Valley only at 10-15 animals (Slaney, 1973). This approximated an earlier estimate by Fish and Wildlife Branch personnel that 10-15 cougar were probably dependent on the same area for some period each year (Gates and Caverhill, 1970). However, both estimates occurred at a time when wildlife biologists were reporting cougar populations at a high level throughout southwestern B.C..

TABLE 2. COUGAR SIGHTINGS IN THE SKAGIT RIVER WATERSHED - 1985-86.

Date	Location	Details	Observer	Reliability Status
December, 1985	Km 37-39 - Silver-Skagit Road	young animal seen on main road	Al Koop	probable
April, 1986	Sumallo drainage	crossed Hwy. 3 just west of Manning Park entrance - observed by Spotted Owl survey crew.	Eric Forsman	confirmed
May, 1986	Km 33 - Silver-Skagit Road	1 female with 2 kittens observed by 2 different logging truck drivers.	Larry Unger	probable
May, 1986	Galene Creek drainage	crossed trail - observed by spotted Owl survey crew.	Eric Forsman	confirmed
May 30, 1986	Km 36 - Silver-Skagit Road	medium-sized animal - observed by Parks Division maintenance staff.	Wayne Cooper	confirmed
June 2, 1986	Km 58 - Silver-Skagit Road	large animal crossed road - observed by Parks Division maintenance staff.	Wayne Cooper	confirmed
June 4, 1986	Km 59 - Silver-Skagit Road	large cougar observed at Ross L. by U.S. Parks ranger - reported to Wayne Cooper.	unknown	confirmed
June 8, 1986	Km 34 - Silver-Skagit Road	observed by Parks Division maintenance crew.	Wayne Cooper	confirmed
July, 1986	Km 57 - Silver-Skagit Road	observed by F&W contract Fisheries personnel.	Ron Gellner	confirmed

Figure 5


Hope
Coquihalla River
Sowaqua Creek
Podunk Cr.
Tulameen R.
Skagit River Watershed
FRASER RIVER
Silverhope Cr.
Sumallo River
Snass Cr.
Skaist R.
Hicks Cr.
Klesilkwa River
Maselpanik Cr.
Skagit River
Skagit Valley Recreational Area
MANNING PROVINCIAL PARK
Similkameen River
Chilliwack River
Chilliwack Lake
British Columbia
Washington State
Silver Creek
ROSS LAKE
Little Beaver Cr.
Lightning Creek
Pasayten River
N.F. Nooksack River
NORTH CASCADES
Skymo Cr.
Big Beaver Creek
PASAYTEN WILDERNESS
Baker River
Ruby Creek
Granite Creek
OKANOGAN NATIONAL FOREST
ROSS LAKE NATIONAL RECREATIONAL AREA
Lake Shannon
S.F. Nooksack R.
SKAGIT RIVER
NATIONAL PARK
Cascade River
LAKE CHELAN NATIONAL RECREATIONAL AREA
GLACIER PEAK WILDERNESS
Lake Chelan
Location Of Cougar Sightings In The Study Area
Scale 1:500,000
LEGEND
National Park Boundaries
Provincial Park Boundaries
Watershed Boundaries
Wilderness Boundaries
Recreational Area Boundaries
Within Study Area

cougar populations at a high level throughout southwestern B.C.. In the early 1980's the minimum population in M.U. 2-2, of which the Skagit watershed constitutes approximately 50 percent in area, was estimated at 30 animals (Forbes, 1980). One long-time cougar hunter estimated that 4-10 cougar use the Lower Skagit Valley for some period each year (Buckle - personal communication). However, no more than 3-4 animals are likely to be present at any one time (Stephens - personal communication).

Based on the data analyzed during this study, it is estimated that 10-15 cougar utilize the entire study area for some period each year. During winter and spring the bulk of this utilization occurs in the Lower Skagit and Klesilkwa Valleys, probably in response to concentrations of deer in those areas. Cougar may be increasing in the area (Stephens - personal communication). This, in part, may account for the frequency of cougar sightings that have occurred this year in both the study area and in adjacent habitat in Washington State (Davison - personal communication).

4.4 Wolf

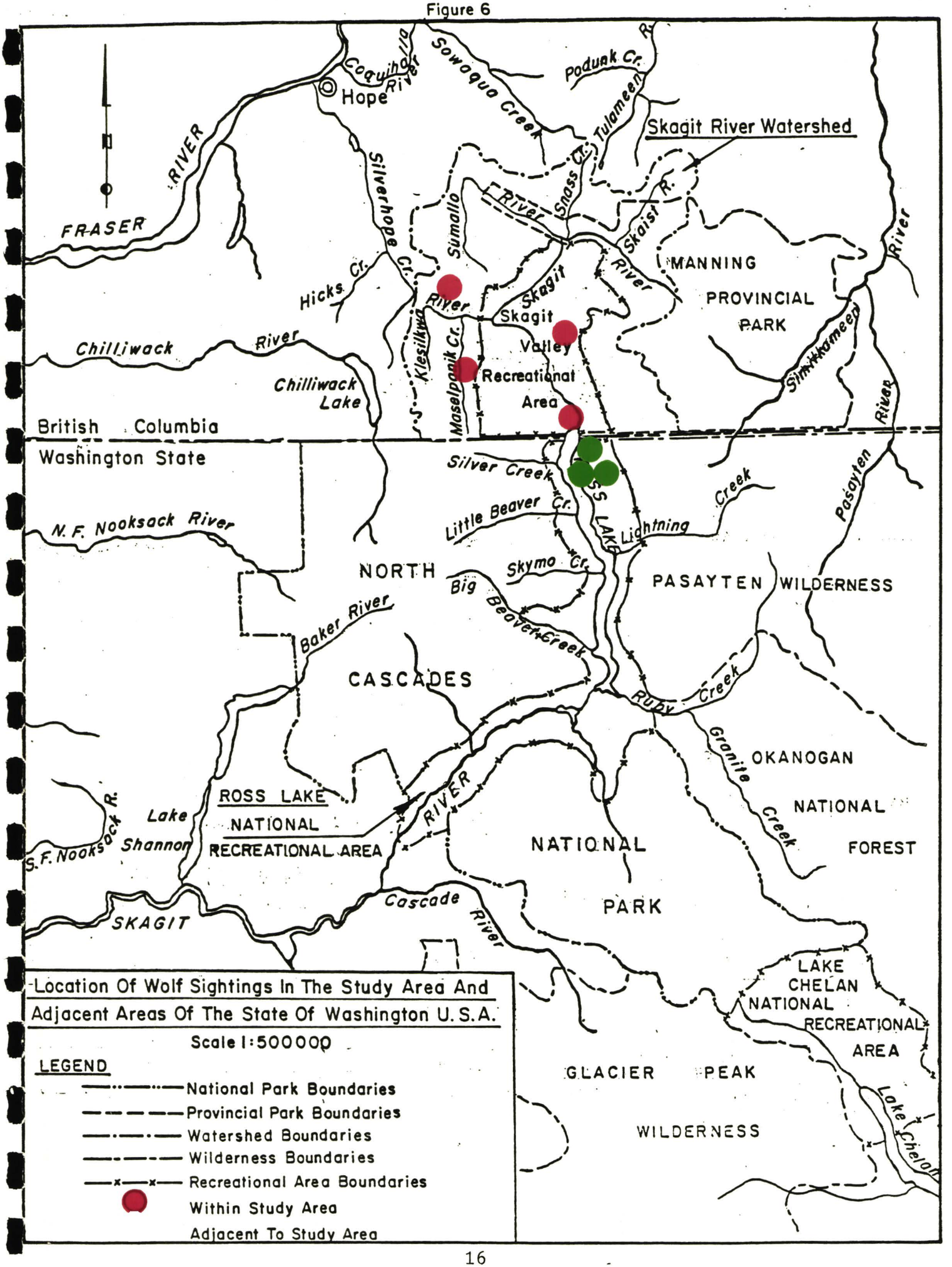
A total of four wolf sightings in the study area were documented (Table 3). An additional three sightings adjacent to the study area in Ross Lake National Recreation Area were obtained from the U.S. National Parks Service (Appendix 4). The relative locations of these sightings are shown in Figure 6. In addition to actual sightings a number of reports of wolf sign (tracks and/or scats) were obtained from reliable sources.

The current presence of wolves in the study area appears to be a relatively recent event. Confirmed sightings and tracks were first reported to Fish and Wildlife Branch personnel shortly after 1979 (J. DeLair - personal communication). Subsequently, during the 1983-84 trapping season DeLair personally noted the tracks of one large wolf on the Silver-Skagit Road. During the same time period tracks of a large wolf were also observed in the area by cougar hunters (Buckle; Stephens - personal communication). That same winter Buckle found three deer kills during a one week period that he attributed to wolf. He based this assumption on the fact that only wolf tracks were present in the snow around the carcasses. He also stated that the deer were in good condition and, therefore, were unlikely to be winter-kills.

TABLE 3 WOLF SIGHTINGS IN THE SKAGIT RIVER WATERSHED - 1980-86.

Date	Location	Details	Observer	Reliability
Sept., 1980	Maselpanik Creek drainage	wolf feeding on deer gut pile.	Larry Unger	probable
Fall, 1982	Shawatum Creek Road	grey-black wolf observed during deer hunting season.	Larry Unger	probable
December, 1985	Km 33 - Silverhope-Skagit Road	observed by faller - on west side of road! Very large animal - reported to Larry Unger.	unknown	probable
May, 1986	Ross Lake	wolf observed running in vicinity of deer carcass.	Ron Gellner	confirmed

Figure 6


Hope
Coquihalla River
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Tulameen
Skagit River Watershed
FRASER RIVER
Silverhope Cr.
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Snass Cr.
Skaist R.
Hicks Cr.
Skagit River
MANNING PROVINCIAL PARK
Similkameen River
Chilliwack River
Chilliwack Lake
Klesilkwa
Maselpanik Cr.
Skagit Valley Recreational Area
British Columbia
Washington State
Silver Creek
Little Beaver Cr.
SS LAKE
Lightning Creek
Pasayten River
N.F. Nooksack River
NORTH CASCADES
Skymo Cr.
Big Beaver Creek
PASAYTEN WILDERNESS
Baker River
Ruby Creek
Granite Creek
OKANOGAN NATIONAL FOREST
ROSS LAKE NATIONAL RECREATIONAL AREA
Lake Shannon
S.F. Nooksack R.
SKAGIT RIVER
NATIONAL PARK
Cascade River
LAKE CHELAN NATIONAL RECREATIONAL AREA
GLACIER PEAK WILDERNESS
Lake Chelan
Location Of Wolf Sightings In The Study Area And Adjacent Areas Of The State Of Washington U.S.A.
Scale 1:500000
LEGEND
National Park Boundaries
Provincial Park Boundaries
Watershed Boundaries
Wilderness Boundaries
Recreational Area Boundaries
Within Study Area
Adjacent To Study Area

During the winter of 1984-85 two wolves were present in the area based on track size (DeLair - personal communication). The following winter (1985-86) DeLair encountered two separate pairs of tracks on several occasions. Another source estimated the wolf population to consist of one pair and a single based on tracks encountered while cougar hunting during the same time period (Buckle - personal observation). That same winter a trapper reported temporarily catching a wolf in the Klesilkwa River Valley (Koop - personal communication).

The source of the wolves now present in the study area is unknown. Two of the three sightings in the Ross Lake National Recreation Area occurred in 1972, well before sightings and tracks became apparent in the study area. Wolf tracks have been encountered in the Chilliwack River drainage immediately west of the study area in the past (Buckle; Stephens - personal communication). Wolves are also present in the Paradise Valley area of the Tulameen River drainage, immediately north of the study area (Chestnut - personal communication).

In conclusion, the numbers of sightings of wolves and occurrence of their sign since 1980 suggests that they have become established in the study area. The present population is low and is estimated at four animals.

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APPENDICES

APPENDIX 1 LETTER SENT TO SELECTED ORGANIZATIONS AND GOVERNMENT AGENCIES SOLICITING SIGHTINGS OF COUGAR, GRIZZLY BEAR AND WOLF - SKAGIT RIVER WATERSHED, 1986.

July 2, 1986

Dear .....:

The Fish and Wildlife Branch, Region II, are currently attempting to develop a preliminary data base for certain wildlife species in the Skagit River watershed - see attached map. The species of interest are Rocky Mountain elk, cougar, grizzly and wolf. I have been contracted by the Branch to assemble as much sighting data as may be available on these species. It would greatly assist me if you could alert those members of your organization who are frequently in the Skagit watershed as to our interest in obtaining any sightings, or reports of sightings, of these species. Although we anticipate most of these would be 1986 sightings, those from other years would be a welcome addition. As the final report is due August 31, 1986, I would require any sighting information no later than August 15, 1986.

Basically, we could certainly use the following data, by species, for each sighting:

- date
- location (as specific as possible)
- number of animals
- sex and age where apparent (eg. sow with 2 cubs; cow with calf; 1 bull; etc.)

Should any of your members be aware of other possible contacts re sightings of the aforementioned species, who either work, live or recreate in the Skagit watershed, I would certainly appreciate their name and phone number or address.

I look forward to your assistance with this important project. I can be contacted at the address and/or phone number below. Thank you for your cooperation.

Yours sincerely,

Tony Barnard
12411 60th Avenue
Surrey, B. C. V3W 1P6

Phone: (604) 594-6752

APPENDIX 2 INDIVIDUALS, ORGANIZATIONS AND GOVERNMENT AGENCIES CONTACTED TO OBTAIN SIGHTINGS OF COUGAR, GRIZZLY BEAR AND WOLF - SKAGIT RIVER WATERSHED, 1986

Individuals

Jack LeLair - trapper, logger and former Conservation Officer
Larry Unger - woods foreman, G. and F. Logging Ltd., Silver Creek
Harold Trottier - trapper, Silver Creek
Brian Fuhr - biologist, Ministry of Environment, Victoria
John Gustafson - trapper and logger, Maple Ridge
Dan Chervenka - trapper, Creston
Al Koop - trapper and logger, Hope
Heinz Schiefermier - trapper, Hope
Kay Keding - Conservation Officer, Chilliwack
Chuck Chestnut - hunter, North Vancouver
Henry Stephens - cougar hunter, Langley
Ernie Buckle - cougar hunter, Maple Ridge
Ted Horsting - cougar hunter, Deroche
Frank Rosenhauer - hunter, Chilliwack
Ron Gellner - contract fisheries technician, Maple Ridge

Organizations

Chilliwack Fish and Game Protective Association
Hope Rod and Gun Club
Chilliwack Field Naturalists Club
Valley Helicopters Ltd.

Government Agencies

Ministry of Forests - Rosedale
U.S. National Parks Service
Ministry of Lands, Parks and Housing
Provincial Museum

APPENDIX 3 RECENT GRIZZLY BEAR SIGHTINGS IN AND ADJACENT TO THE U.S. PORTION OF THE SKAGIT RIVER WATERSHED - 1969-1985.

NATIONAL PARK SERVICE WILDLIFE OBSERVATIONS
NORTH CASCADES NATIONAL PARK SERVICE COMPLEX AND ENVIRONS 1965 - 1985
SORTED BY: COMMON NAME AND INDEX NUMBER

URAR003 NAME: GRIZZLY BEAR - URSUS ARCTOS
NAME OF AREA: NORTH CASCADES NP
OBSERVER: WDG
DATE OF SIGHTING: 07/24/1969
CONFIRMED BY BIO. STAFF? N
GENERAL DESCRIPTION: STATEMENT "GRIZZLY NOTED" APPEARED IN WDG SUMMARY OF 1969 HIGH LAKE FISHING REPORT DATED 6/1970 (P 1).

UNIVERSAL TRANSVERSE MERCATOR: N5379500E626500
QUADNAME: MARBLEMOUNT
COUNTY: SKAGIT
ELEVATION IN METERS: 1500
QUADCODE: 4812114

URAR004 NAME: GRIZZLY BEAR - URSUS ARCTOS
NAME OF AREA: NORTH CASCADES NP
OBSERVER: L WARNER
DATE OF SIGHTING: 08 1969
CONFIRMED BY BIO. STAFF? N
GENERAL DESCRIPTION: NPS NEWS RELEASE (8/1969) STATED THAT A GRIZZLY WAS SEEN IN THE UPPER THUNDER CRK. VALLEY.

UNIVERSAL TRANSVERSE MERCATOR:
QUADNAME: FORBIDDEN PK.
COUNTY: SKAGIT
ELEVATION IN METERS: 1500
QUADCODE: 4812124

URAR006 NAME: GRIZZLY BEAR - URSUS ARCTOS
NAME OF AREA: NORTH CASCADES NP
OBSERVER: T CARPENTER
DATE OF SIGHTING: 08 1972
CONFIRMED BY BIO. STAFF? N
GENERAL DESCRIPTION: GRIZZLY SEEN NEAR BEAR LAKE IN THE CHILLIWACK R. DRAINAGE. INFO FROM WDG NONGAME DATA SYSTEM.

UNIVERSAL TRANSVERSE MERCATOR: N5422500E623500
QUADNAME: MT. CHALLENGER
COUNTY: WHATCOM
ELEVATION IN METERS: 1750
QUADCODE: 4812103

NATIONAL PARK SERVICE WILDLIFE OBSERVATIONS
NORTH CASCADES NATIONAL PARK SERVICE COMPLEX AND ENVIRONS 1965 - 1985
SORTED BY: COMMON NAME AND INDEX NUMBER

URAR008 NAME: GRIZZLY BEAR - URSUS ARCTOS
NAME OF AREA: OKANOGAN NF
OBSERVER: T GRAVES (PACKER FROM WINTHROP)
DATE OF SIGHTING: 07/25/1978
CONFIRMED BY BIO. STAFF? N
GENERAL DESCRIPTION: A BEAR, POSITIVELY IDENTIFIED AS A GRIZZLY, WAS SEEN ON A SNOWFIELD AT THE PASS BETWEEN ELBOW BASIN AND BIG FACE CRK., FROM 0.3.KM.

UNIVERSAL TRANSVERSE MERCATOR: N5421000E656000
QUADNAME: THREE FOOLS
COUNTY: WHATCOM
ELEVATION IN METERS: 1850
QUADCODE: 4812006

URAR010 NAME: GRIZZLY BEAR - URSUS ARCTOS
NAME OF AREA: ROSS LAKE NRA
OBSERVER: J HUDDLESTON (NPS)
DATE OF SIGHTING: 07/09/1980
CONFIRMED BY BIO. STAFF? N
GENERAL DESCRIPTION: BEAR SEEN ALONG LIGHTNING CRK. TRAIL, 5 KM FROM ROSS LK.

UNIVERSAL TRANSVERSE MERCATOR: N5417000E648000
QUADNAME: THREE FOOLS
COUNTY: WHATCOM
ELEVATION IN METERS: 1850
QUADCODE: 4812006

URAR009 NAME: GRIZZLY BEAR - URSUS ARCTOS
NAME OF AREA: ROSS LAKE NRA
OBSERVER: C. THRESHER (NPS)
DATE OF SIGHTING: 08/26/1978
CONFIRMED BY BIO. STAFF? N
GENERAL DESCRIPTION: BEAR SEEN 0.5 KM SE OF DESOLATION LOOKOUT, WHERE IT MAY HAVE BEEN ATTRACTED BY A DEAD MARMOT. SEEN FROM 400M USING 7X50 BINOS. I HAVE SPENT TIME IN ALASKA WITH GRIZZLIES AND AM CONFIDENT OF ID.

UNIVERSAL TRANSVERSE MERCATOR: N5419500E645500
QUADNAME: HOZOMEEN
COUNTY: WHATCOM
ELEVATION IN METERS: 1850
QUADCODE: 4812105

NATIONAL PARK SERVICE WILDLIFE OBSERVATIONS
NORTH CASCADES NATIONAL PARK SERVICE COMPLEX AND ENVIRONS 1965 - 1985
SORTED BY: COMMON NAME AND INDEX NUMBER

URAR011 NAME: GRIZZLY BEAR - URSUS ARCTOS

NAME OF AREA: WENATCHEE NF

OBSERVER: T REESE

DATE OF SIGHTING: 07/22/1980

CONFIRMED BY BIO. STAFF? N

GENERAL DESCRIPTION: BEAR SEEN AT INTERSECTION OF PRINCE CRK. AND THE SUMMIT TRAIL E OF LK. CHELAN. 80% SURE OF IDENTIFICATION.

UNIVERSAL TRANSVERSE MERCATOR: N5346000E693000

QUADNAME:

COUNTY: CHELAN

ELEVATION IN METERS: 2100

QUADCODE:

URAR005 NAME: GRIZZLY BEAR - URSUS ARCTOS

NAME OF AREA: OKANOGAN NF

OBSERVER: D AND R NAAS (NPS)

DATE OF SIGHTING: 07/26/1972

CONFIRMED BY BIO. STAFF? N

GENERAL DESCRIPTION: THE NAAS', ALONG WITH C ARENDTS, J DAVIS AND L MEHLER OF THE USFS, OBSERVED POSSIBLE GRIZZLY TRACK (25 X 14 CM) ON TRAIL #2000 (USFS) 1.5 KM S OF WINDY PASS.

UNIVERSAL TRANSVERSE MERCATOR: N5404000E668000

QUADNAME: PTARMIGAN PK.

COUNTY: OKANOGAN

ELEVATION IN METERS: 1800

QUADCODE: 4812007

URAR001 NAME: GRIZZLY BEAR - URSUS ARCTOS

NAME OF AREA: OKANOGAN NF

OBSERVER: T GRAVES (PACKER FROM WINTROP)

DATE OF SIGHTING: 1968

CONFIRMED BY BIO. STAFF? N

GENERAL DESCRIPTION: TWO BEARS, POSITIVELY IDENTIFIED AS GRIZZLIES, WERE SEEN ALONG THE MIDDLE FORK PASAYTEN R. THE NEXT DAY AN ACQUAINTANCE, DALE TONSETH, SAW TWO BEARS, PROBABLY THE SAME, ALONG ROBINSON CRK.

UNIVERSAL TRANSVERSE MERCATOR: N5402000E673000

QUADNAME: PTARMIGAN PK.

COUNTY: OKANOGAN

ELEVATION IN METERS: 1750

QUADCODE: 4812007

NATIONAL PARK SERVICE WILDLIFE OBSERVATIONS
NORTH CASCADES NATIONAL PARK SERVICE COMPLEX AND ENVIRONS 1965 - 1985
SORTED BY: COMMON NAME AND INDEX NUMBER

URAR002 NAME: GRIZZLY BEAR - URSUS ARCTOS

NAME OF AREA: NORTH CASCADES NP

OBSERVER: G DOUGLAS (UW)

DATE OF SIGHTING: 1969

CONFIRMED BY BIO. STAFF? N

GENERAL DESCRIPTION: SEVERAL GRIZZLIES SEEN AND ONE SHOT NEAR CASCADE PASS IN RECENT YEARS (SINCE 1948). INFO. FROM WDG NONGAME DATA SYSTEM.

UNIVERSAL TRANSVERSE MERCATOR: N5370000E643000

QUADNAME: CASCADE PASS

COUNTY: SKAGIT

ELEVATION IN METERS: 1500

QUADCODE: 4812135

URAR007 NAME: GRIZZLY BEAR - URSUS ARCTOS

NAME OF AREA: OKANOGAN NF

OBSERVER: H WILLS

DATE OF SIGHTING: 08/26/1972

CONFIRMED BY BIO. STAFF? N

GENERAL DESCRIPTION: BEAR CAME DOWN SLOPE AND CROSSED STATE HIGHWAY 20 ABOUT 1 KM W OF EARLY WINTERS CRK. NOT OVERLY LARGE, BUT IT HAD DARK SILVER-TIPPED FUR, A SHOULDER HUMP, AND A CONCAVE FACE.

UNIVERSAL TRANSVERSE MERCATOR: N5385000E677000

QUADNAME: MAZAMA

COUNTY: OKANOGAN

ELEVATION IN METERS: 1100

QUADCODE: 4812021

URAR012 NAME: GRIZZLY BEAR - URSUS ARCTOS

NAME OF AREA: OKANOGAN NF

OBSERVER: ROB SHULL (USFS)

DATE OF SIGHTING: 09/03/1983

CONFIRMED BY BIO. STAFF? N

GENERAL DESCRIPTION: 1 REPORTED FORAGING IN MEADOW SE. OF WHISTLER MT. BY 8 OBSERVERS. ARTICLE APPEARED IN METHOW VALLEY NEWS IN TWISP ON THURS. SEPTEMBER 15, 1983 (VOL.. 80, NO. 13).

UNIVERSAL TRANSVERSE MERCATOR: N5375500E669500

QUADNAME: WASHINGTON PASS

COUNTY: CHELAN

ELEVATION IN METERS: 1700

QUADCODE: 4812027

NATIONAL PARK SERVICE WILDLIFE OBSERVATIONS
NORTH CASCADES NATIONAL PARK SERVICE COMPLEX AND ENVIRONS 1965 - 1985
SORTED BY: COMMON NAME AND INDEX NUMBER

URAR014 NAME: GRIZZLY BEAR - URSUS ARCTOS

NAME OF AREA: NORTH CASCADES NP

OBSERVER: W RIGBY - NPS

DATE OF SIGHTING: 07/ 1985

CONFIRMED BY BIO. STAFF? N

GENERAL DESCRIPTION: MARBLEMOUNT RESIDENT REPORTED TO NPS A GRIZZLY AT CASCADE PASS AREA. CLAIMED TO BE FAMILIAR WITH IDENTIFYING FEATURES.

UNIVERSAL TRANSVERSE MERCATOR: N5370000E643500

QUADNAME: CASCADE PASS

COUNTY: SKAGIT

ELEVATION IN METERS: 1500

QUADCODE: 4812135

URAR013 NAME: GRIZZLY BEAR - URSUS ARCTOS

NAME OF AREA: MT. BAKER-SNOQUALMIE NF

OBSERVER: W RIGBY - NPS

DATE OF SIGHTING: 07/ 1985

CONFIRMED BY BIO. STAFF? N

GENERAL DESCRIPTION: 1 JUST W OF WASHINGTON PASS ON WHISTLER MT. IN SUBALPINE. SEEN BY VISITOR AND REPORTED TO NPS.

UNIVERSAL TRANSVERSE MERCATOR: N5376500E671000

QUADNAME: WASHINGTON PASS

COUNTY: CHELAN

ELEVATION IN METERS: 1750

QUADCODE: 4812027

APPENDIX 4 RECENT WOLF SIGHTINGS IN ROSS LAKE NATIONAL RECREATION AREA, WASHINGTON STATE, U.S.A. - 1972-85.

NATIONAL PARK SERVICE WILDLIFE OBSERVATIONS
NORTH CASCADES NATIONAL PARK SERVICE COMPLEX AND ENVIRONS 1965 - 1985
SORTED BY: COMMON NAME AND INDEX NUMBER

CALU002 NAME: GRAY WOLF - CANIS LUPUS
NAME OF AREA: NORTH CASCADES NP
OBSERVER: B MCKINNEY AND S FROST (NPS)
DATE OF SIGHTING: 10/10/1970
CONFIRMED BY BIO. STAFF? N
GENERAL DESCRIPTION: WOLF HEARD IN SOUTH FORK OF BRIDGE CRK.

UNIVERSAL TRANSVERSE MERCATOR: N5370000E666000
QUADNAME: McGREGOR MTN.
COUNTY: CHELAN
ELEVATION IN METERS: 1250
QUADCODE: 4810237

CALU003 NAME: GRAY WOLF - CANIS LUPUS
NAME OF AREA: NORTH CASCADES NP
OBSERVER: B MCKINNEY (NPS)
DATE OF SIGHTING: 06 1972
CONFIRMED BY BIO. STAFF? N
GENERAL DESCRIPTION: HEARD HOWLING ALONG BIG BEAVER CRK.

UNIVERSAL TRANSVERSE MERCATOR: N5417000E626000
QUADNAME: MT. CHALLENGER
COUNTY: WHATCOM
ELEVATION IN METERS: 750
QUADCODE: 4812103

CALU001 NAME: GRAY WOLF - CANIS LUPUS
NAME OF AREA: NORTH CASCADES NP
OBSERVER: R E KRESEK (MOUNTAINEERS)
DATE OF SIGHTING: 02/28/1967
CONFIRMED BY BIO. STAFF? N
GENERAL DESCRIPTION: WOLF 3.5 KM SE OF PARK CRK. PASS.

UNIVERSAL TRANSVERSE MERCATOR: N5370000E653000
QUADNAME: GOODE MTN.
COUNTY: CHELAN
ELEVATION IN METERS: 900
QUADCODE: 4812036

NATIONAL PARK SERVICE WILDLIFE OBSERVATIONS
NORTH CASCADES NATIONAL PARK SERVICE COMPLEX AND ENVIRONS 1965 - 1985
SORTED BY: COMMON NAME AND INDEX NUMBER

CALU004 NAME: GRAY WOLF - CANIS LUPUS
NAME OF AREA: ROSS LAKE NRA
OBSERVER: B MCKINNEY (NPS)
DATE OF SIGHTING: 06/06/1972
CONFIRMED BY BIO. STAFF? N
GENERAL DESCRIPTION: ONE SEEN NEAR WILLOW LK.
UNIVERSAL TRANSVERSE MERCATOR: N5423000E646000
QUADNAME: HOZOMEEN
COUNTY: WHATCOM
ELEVATION IN METERS: 750
QUADCODE: 4812105

CALU006 NAME: GRAY WOLF - CANIS LUPUS
NAME OF AREA: WENATCHEE NF
OBSERVER: ILLEGIBLE
DATE OF SIGHTING: 07/29/1975
CONFIRMED BY BIO. STAFF? N
GENERAL DESCRIPTION: APPARENT WOLF SEEN BRIEFLY ON THE AGNES CRK. TRAIL 1.6 KM N OF CLOUDY PASS.
UNIVERSAL TRANSVERSE MERCATOR: N5343000E656000
QUADNAME: HOLDEN
COUNTY: CHELAN
ELEVATION IN METERS: 1800
QUADCODE: 4812052

CALU007 NAME: GRAY WOLF - CANIS LUPUS
NAME OF AREA: LAKE CHELAN NRA
OBSERVER: D SCOTT
DATE OF SIGHTING: 07/05/1976
CONFIRMED BY BIO. STAFF? N
GENERAL DESCRIPTION: SEEN NEAR JUANITA LAKE COMING TOWARDS US FROM 300 M. STOPPED NEAR TRAIL JUNCTION ABOUT 30 M AWAY AND BRIEFLY SURVEYED THE AREA.
UNIVERSAL TRANSVERSE MERCATOR: N5354500E678500
QUADNAME: STEHEKIN
COUNTY: CHELAN
ELEVATION IN METERS: 2020
QUADCODE: 4812038

NATIONAL PARK SERVICE WILDLIFE OBSERVATIONS
NORTH CASCADES NATIONAL PARK SERVICE COMPLEX AND ENVIRONS 1965 - 1985
SORTED BY: COMMON NAME AND INDEX NUMBER

CALU005 NAME: GRAY WOLF - CANIS LUPUS
NAME OF AREA: ROSS LAKE NRA
OBSERVER: B MCKINNEY (NPS)
DATE OF SIGHTING: 07/10/1972
CONFIRMED BY BIO. STAFF? N
GENERAL DESCRIPTION: ONE SEEN IN HOZOMEEN CAMPGROUND.

UNIVERSAL TRANSVERSE MERCATOR: N5428000E641000
QUADNAME: HOZOMEEN
COUNTY: WHATCOM
ELEVATION IN METERS: 490
QUADCODE: 4812105

CALU008 NAME: GRAY WOLF - CANIS LUPUS
NAME OF AREA: NORTH CASCADES NP
OBSERVER: FIRE CREW MEMBER
DATE OF SIGHTING: 08/12/1978
CONFIRMED BY BIO. STAFF? N
GENERAL DESCRIPTION: WOLF SEEN DURING THE SOURDOUGH MTN. FIRE. REPORTED TO VICTOR LEWIS (NPS)

UNIVERSAL TRANSVERSE MERCATOR: N5400000E640000
QUADNAME: ROSS DAM
COUNTY: WHATCOM
ELEVATION IN METERS: 1500
QUADCODE: 4812116

CALU009 NAME: GRAY WOLF - CANIS LUPUS
NAME OF AREA: ROSS LAKE NRA
OBSERVER: M SHIELDS (NPS)
DATE OF SIGHTING: 04/25/1981
CONFIRMED BY BIO. STAFF? N
GENERAL DESCRIPTION: WOLF SEEN ALONG THE SHORE OF WILLOW LAKE. IT SAW ME, PAUSED, AND TROTTED OFF INTO SOME TIMBER.

UNIVERSAL TRANSVERSE MERCATOR: N5423000E646000
QUADNAME: HOZOMEEN
COUNTY: WHATCOM
ELEVATION IN METERS: 1500
QUADCODE: 4812105