A PRELIMINARY STUDY OF GRAY WOLF HISTORY AND STATUS IN THE REGION OF THE CASCADE MOUNTAINS OF WASHINGTON STATE

Jack R. Laufer and Peter T. Jenkins

Washington Wolf Project
A committee of Wolf Haven America

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I. INTRODUCTION

With the exception of man, the gray wolf (Canis lupus) has the greatest natural range of any living terrestrial mammal. It was once found in all habitats of the Northern Hemisphere, with the exception of tropical forests and arid deserts (Nowak and Paradiso, 1983). Today, it remains in less than 1 percent of its former range in the contiguous United States.

According to Mech (1970) the primary role or "occupation" of the wolf "is that of the northern predator upon large mammals", a role that it shares with man.

Man has played the dominant role in the demise of the wolf. Records of organized wolf control date back to the ancient Greeks. Wolves are often believed a direct threat to man. In reality, only two well-documented reports of wild wolf "attacks" in North America exist. The first involved a wolf which was described as probably rabid (Mech 1970) and the second a case of an aggressive leap that made contact with a human, but caused no injury. (Nowak and Paradiso 1983).

A more substantive basis for wolf control has been depredation on domestic animals, notably cattle. Additionally, in the 20th century, control has been justified because of an "alleged threat" to populations of wild ungulates and related sport hunting (Nowak and Paradiso 1983)

Historically, taxonomists divided the wolves of North America into 24 "subspecies". Under this system of classification Canis lupus fuscus, the "Cascades wolf", inhabited the Cascade Range of Washington State (Young 1944). Recent studies question the validity of 24 subspecies and suggest this number should be greatly reduced (Nowak 1983). In any event, the "Cascades wolf" was described by Young (1944) as a medium sized wolf, with "a dark cinnamon or cinnamon-buffy" coloration with the dorsal area "profusely overlaid with black". It was referred to by the early white settlers as "red legs". The wolf was eliminated from Washington state as a breeding resident by 1930 (Young 1944).

The current southernmost range of known wolf packs in British Columbia (Figure 10) is approximately 160 km (100mi.) north of the Washington/British Columbia border, in the Elaho River drainage, near Squamish, B.C. (Forbes 1989).

Little information regarding historical or present wolf population status in the Cascades area has been collected or compiled into accessible reports. Despite continuing and increasing numbers of reliable sightings, to date there have been no official efforts to study or promote wolf conservation. In other regions similar increases of wolf reports, where near established wolf populations, have preceded re-establishment of breeding wolf populations in Alaska (Peterson et al 1984), northwest Minnesota (Fritts and Mech 1981), Wisconsin (Theil 1988), Vancouver Island (Hebert et al 1983), and Montana (Ream et al 1985).

Studies of the history and status of wolves have been undertaken with respect to Northeastern Washington (Hansen 1986) and the Olympic National Park area (Dratch et al 1975), to the east and west of the study area, respectively. The Cascades are the last major unstudied area along the northern tier of the Lower 48 with significant potential for wolf recolonization. In an attempt to fill that void this report was generated. The objectives of this report are to review all known historical records and to review the status of current information known about the wolf in the Cascade Range of Washington.

II. STUDY AREA

The study area of this report is the portion of the Cascade Mountains (including foothill regions) extending from the Columbia River, on the Oregon-Washington border in the south, to the Fraser River of British Columbia in the north. The southern British Columbia portion of the study area includes those areas generally considered to be within the Cascade Mountains. This includes the drainages of the Skagit and Chilliwack Rivers and Silverhope Creek (Figure 1).

The Cascade Mountains are the highest in the state and effectively divide the state into two major climatic regions. Mount Rainier (14,410 feet) is the highest landform in the state, and Mount Baker and the famous Mount Saint Helens are also found in this range. Geologists distinguish the North Cascades from the South Cascades, placing the dividing line across Snoqualmie Pass. The North Cascades are more rugged due to more pronounced effects of volcanic activity and glacial ice (Scott and De Lorme 1988).

Scott and De Lorme (1988) describe a total of five vegetative zones associated with the Cascade mountains:

Tsuga heterophylla Zone:
This zone includes most of the lower parts of the western side of the Cascades. Western hemlock (Tsuga heterophylla) and western red ceder (Thuja plicata) are the dominant species in association with Douglas fir (Pseudotsuga menziesii) and grand fir.

Subalpine Forest:
Dominated by mountain hemlock (Tsuga mertensia) and subalpine fir (Abies lasiocarpa) this type is also found on the western slopes of the Cascades at elevations of up to 4,000 feet.

Timberline and Alpine Regions:
At an elevation of roughly 5,000 feet in the northern Cascades to 6,000 feet in the southern Cascades, trees are replaced by shrubs and plants forming alpine meadows.

Abies grandis/Pseudotsuga menziessi Zone:
Found on the eastern slopes of the Cascades at elevations from 3,500 to 5,000 feet this zone is usually dominated by grand fir (Abies grandis). Associated species include ponderosa pine, lodgepole pine, western larch and Douglas fir.

Pinus ponderosa Zone:
Dominated by ponderosa pine, this zone forms a strip ten to twenty miles wide on the eastern slopes of the Cascades at an elevation of 2,000 to 4,000 feet.

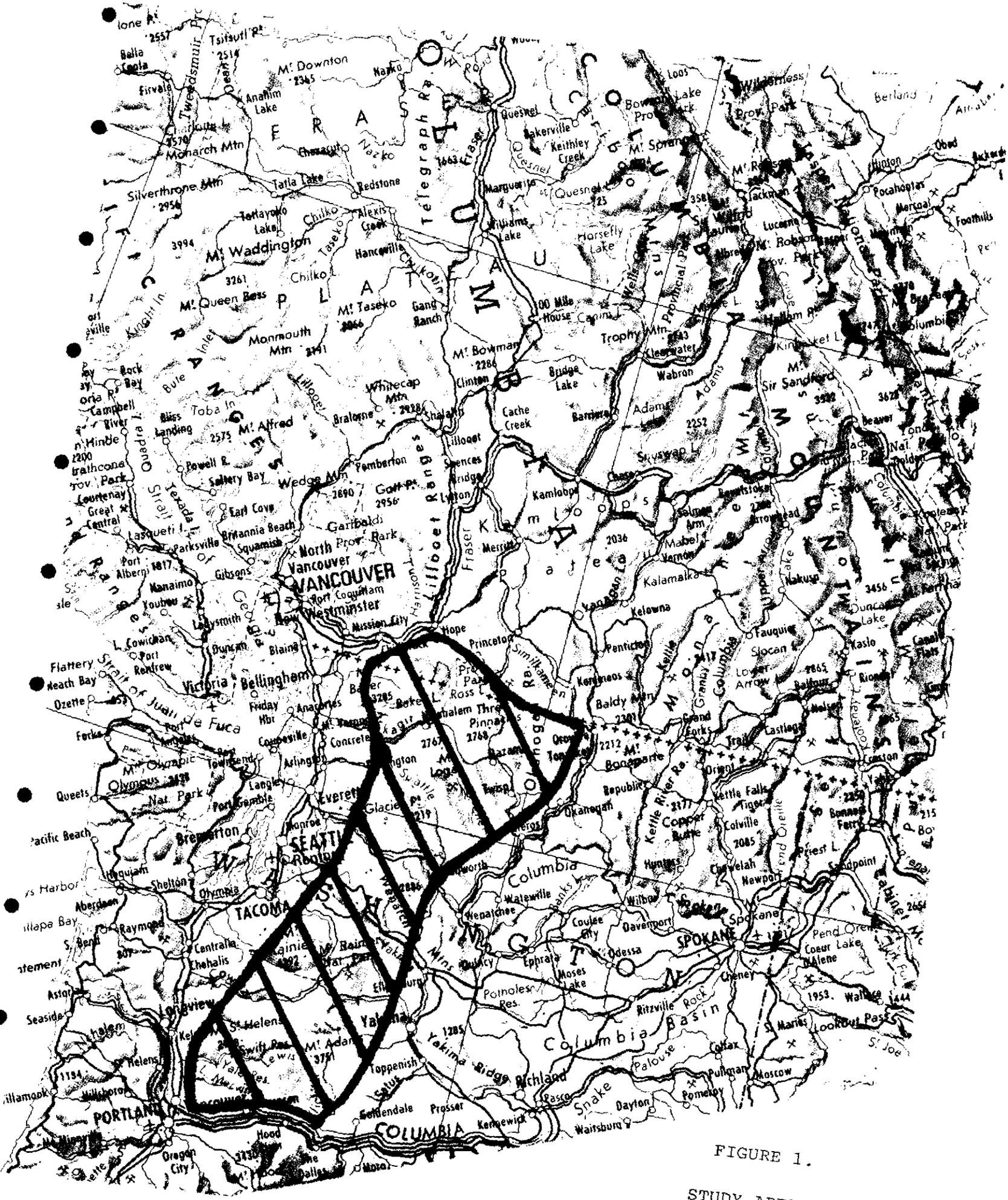


FIGURE 1.

STUDY AREA

III. METHODS

A. Historical evidence of wolves

Historical information and evidence regarding wolves in the Cascades area was obtained by reviewing literature; county, state, provincial and federal records; reports from the Hudson's Bay Company Archives; and related materials.

B. Present status of wolves

All known wolf reports since 1946 from the study area were collected from the Washington Department of Wildlife, North Cascades and Mount Rainier National Parks, and other public sources. Additional reports were obtained by the authors directly from individuals who made the observation. Where possible, persons reporting recent (1973-1988) wolf observations were contacted and interviewed regarding their observations.

Observation information was recorded on a standard report form (N.R.M.W.R.P. 1988) (Appendix 1). Reports were then rated using Weaver's (1978) point system (Table 1). Use of this system reduces the subjectivity involved with rating reports. The main purpose for the rating system is to provide an indication of its reliability, that is, to determine whether the animal (or sign) was probably a wolf, rather than coyote or dog. Reports scoring 16 or more were rated as "probable"; those of 15 or less, as "possible".

Table 1. Criteria and point system for categorizing wolf observations (Weaver, 1978).

Criteria	Points
Observer:	
experience with Western coyotes	7
experience with wolves	3
Observation:	
distance:	
<100 m	3
100-400 m	2
>400 m	
length of observation time:	
>10 seconds	1
optical aid such as binoculars:	1
Description of animal and/or sign:	
Body description:	
large body size	4
large and blocky head, short ears and relatively short muzzle	4
relatively large, long legs	2
Color:	
solid white or black	10
Howl:	
distinctively different from coyote	10
Track:	
>10cm (4.0in) long including toe-nails (must include evidence to rule out domestic dogs)	10

IV. RESULTS

A. History

1. Early History

The Cascade Range was covered by glacial ice until the end of the Pleistocene. Retreat of these glaciers set the stage for the migration of wolves into the area from the southern Great Plains (Nowak 1983).

It appears that native people following wildlife herds migrated into the Washington area some 8,000 years ago. The most likely travel route for those who settled in the Cascades area was the Cordilleran Route. This route actually started in Asia; traveled over the Continental Glacier; and then followed the interior valleys of modern-day British Columbia (Scott and De Lorme, 1988).

Several tribes residing in or near the Cascades, such as the Skagit, Skykomish and Taitinapam, lived in relative harmony with the wolf for thousands of years (Scott, 1988). Many of the tribes saw the wolf as a spiritual helper and peoples such as the Kwakiutl of Vancouver Island had a taboo against killing them. (Savaadkin, 1953).

The actual association between wolf and man seems to have varied between the tribes, but utilized a central theme of the wolf "helping" man to exist. This "help" was thought to allow one to prosper both physically and socially (Amoss, 1975; Fahey, 1986; Presnall, 1946; Morning Dove, 1976; Ray, 1932).

Some wolves were taken for their fur by the natives (Young 1946, Ray 1932). The Sanpoil and Nespelem of the Colville area, for example, had no social restrictions on the taking of wolves for robes or blankets. It appears they used both traps and deadfalls to capture wolves (Ray 1932).

Presnall, in a paper on wildlife conservation, reported that before "the white invasion" the human population was too low to exert much pressure on wildlife populations. Additionally, he saw neither "incentive or the means" for the natives seriously depleting game. "It seems likely that prior to the time of Columbus the mammal populations of the western hemisphere had adjusted themselves to a fairly stable biotic balance, in which humans were subjected to much the same controls as were other species" (Presnall, 1946) .

The 1700's brought a change to the Pacific Northwest, with the introduction of the horse. Fahey (1986) commented on its arrival around 1730: "horses reached the Kalispels [of northeastern Washington] by intertribal trading and thievery from Spanish outposts in the American southwest".

Kalispel life, and that of other tribes, sped up dramatically with the horse. Journeys that once took weeks now took days; those of days, hours. Other changes were also to occur: "a horseman killed and transported more small game than a hunter on foot, and while the Kalispels' boundaries did not change, with horses they could kill off faster all the game in one area. They moved oftener and gave small game less time to replenish. Skins became so commonplace that Kalispels used them for tipis, discarding woven mats" (Fahey, 1986). Cox (Dryden 1949), Presnall (1946), and Ray (1932) also reported similar effects for various tribes in the area.

2. Early Fur Trade

One of the first resources of the Pacific Northwest to be exploited by the white traders was fur. Initially the fur trade was based on sea otter pelts; organized commercial operations started in 1784. According to Scott and De Lorme (1988): "between 1785 and 1810 not fewer than a half million sea otter pelts were harvested by coastal Indians for trade with the Americans and British". This harvest drove the sea otter to near extinction and there was a shift to the trapping of beaver. Brooks (1961) reports a total of 405,472 beaver pelts were traded at Fort Vancouver, on the Columbia river, between 1834 and 1837 alone.

The early fur trade led to further exploration and development of the region. In 1813 the Northwest Company began exploitation of the upper Columbia (Scott and De Lorme, 1988).

3. The Later Fur Trade (1821-1859)

The arrival of the Hudson's Bay Company in 1821 marked the beginning of vast changes in the "Oregon Country" (Oregon, Washington and Idaho). Although the Oregon Country was never legally granted to the Hudson's Bay Company it was administered by the Canadian Dr. John McLoughlin. Under his direction all parts of this region were systematically exploited for furs (Scott and De Lorme, 1988).

The goals of this enterprise were threefold: "1. To enhance the British claim to the entire area; 2. to keep out Americans; 3. to make a profit for the stockholders by means of exploitation of the fur trade, the Indian market, or any other commercial means which seemed advisable" (Brooks 1961).

The Hudson's Bay Company relied solely on the native Americans to trap for them, and an elaborate trade system was organized. The base of trade was the pelt. Pelts were traded for tokens, then tokens traded for goods. Usually fur "brigades" traveled to the major trapping areas each spring, traded with the natives, and the pelts were finally assembled for shipment at Fort Vancouver (Scott and De Lorme, 1988).

During the period of 1827-1859 four posts in the Cascades area reported trading in wolf pelts (Fig. 2). Thompson River (Fig. 3), was constructed by the British in the early 1800's near the present town of Kamloops, British Columbia (roughly 100 miles north of the Canadian Skagit watershed). 1,185 wolf pelts were traded here during 1827-1859; Fort Nisqually (Fig. 4) established in 1833, was located near the Cascades, at the southern end of Puget Sound. A total of 249 wolf pelts were traded; Fort Vancouver, (Fig. 5.) located on the north bank of the Columbia River, was established in 1826. A total of 416 wolf pelts were traded; Fort Colville (Fig. 6) was located on the Columbia River and constructed in 1825 (Hudson's Bay Archives 1988). A total of 5,911 wolf pelts were traded here.

A total of 7,761 wolf pelts were traded during this time period from these forts near the Cascades area, as shown in Fig. 7. For comparison, records from Fort Nez Perces, (eastern Washington) show 8,234 wolf pelts taken during the same time period (Fig. 8). Established in 1818, Fort Nez Perces was located at the confluence of the Walla Walla and the Columbia rivers (Hudson's Bay Archives 1988).

FIGURE 2.

LOCATIONS OF FUR-TRADING POSTS

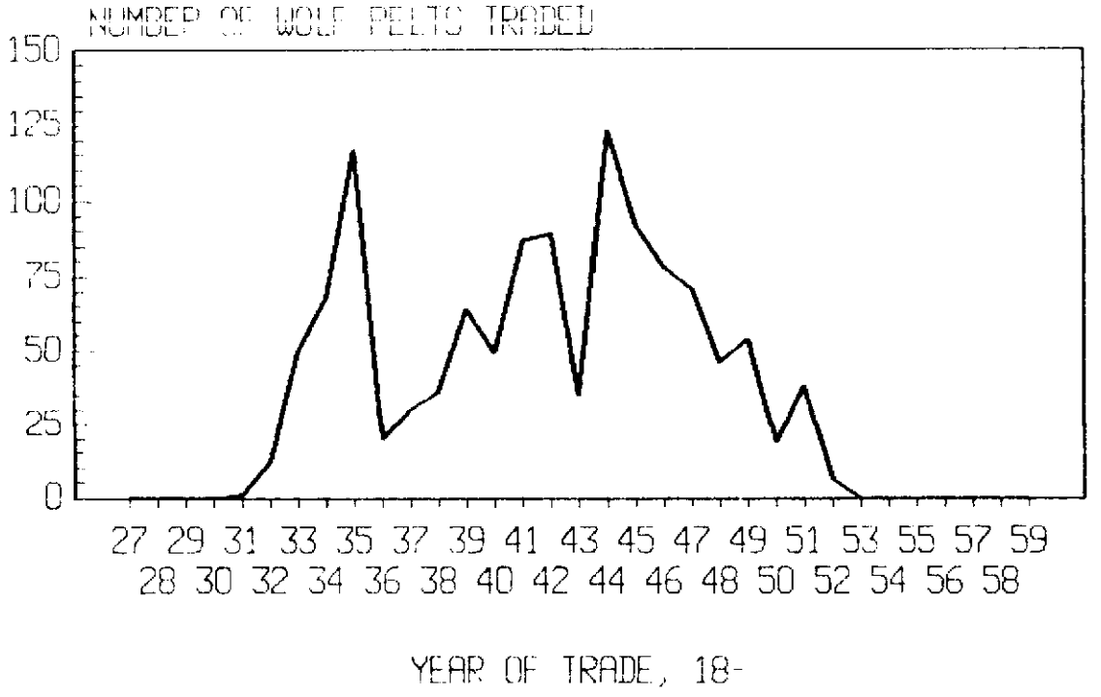


Fig. 3. Thompson River; a total of 1,185 wolf pelts were traded.

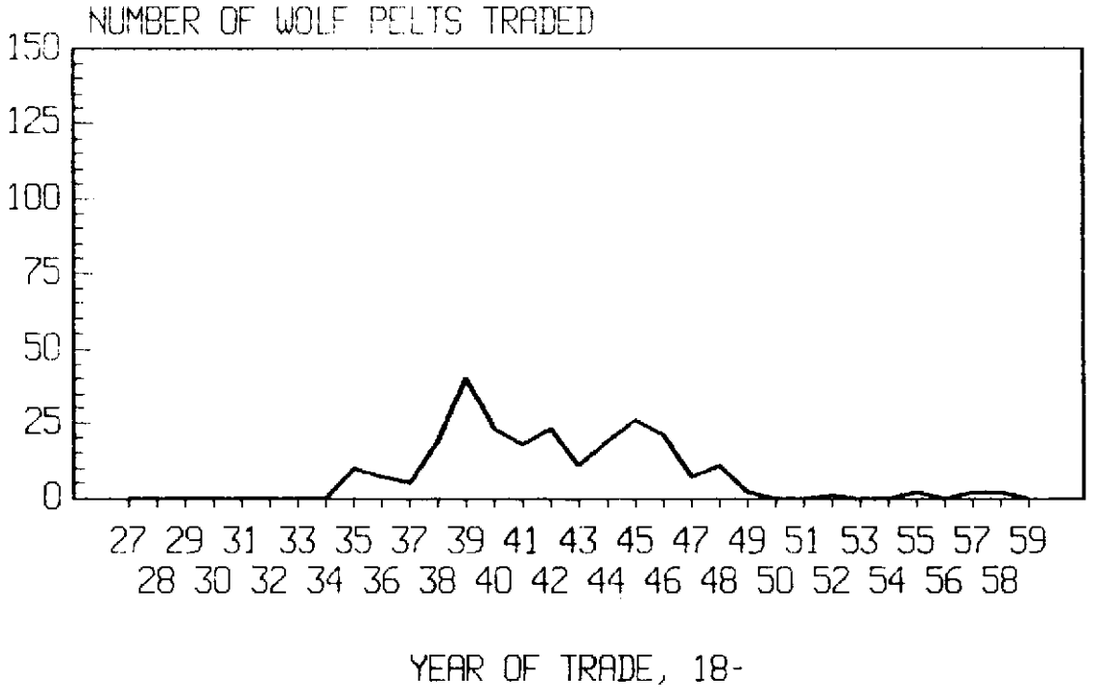


Fig. 4. Fort Nisqually; a total of 249 wolf pelts were traded.

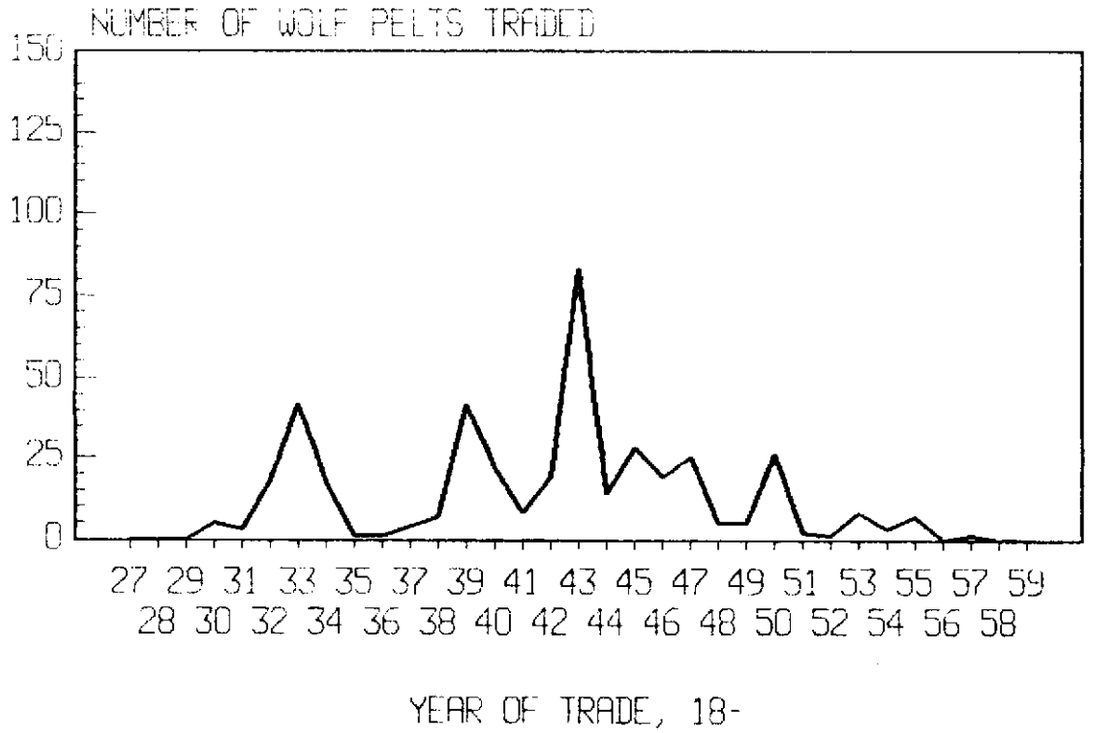


Fig. 5. Fort Vancouver; a total of 416 wolf pelts were traded.

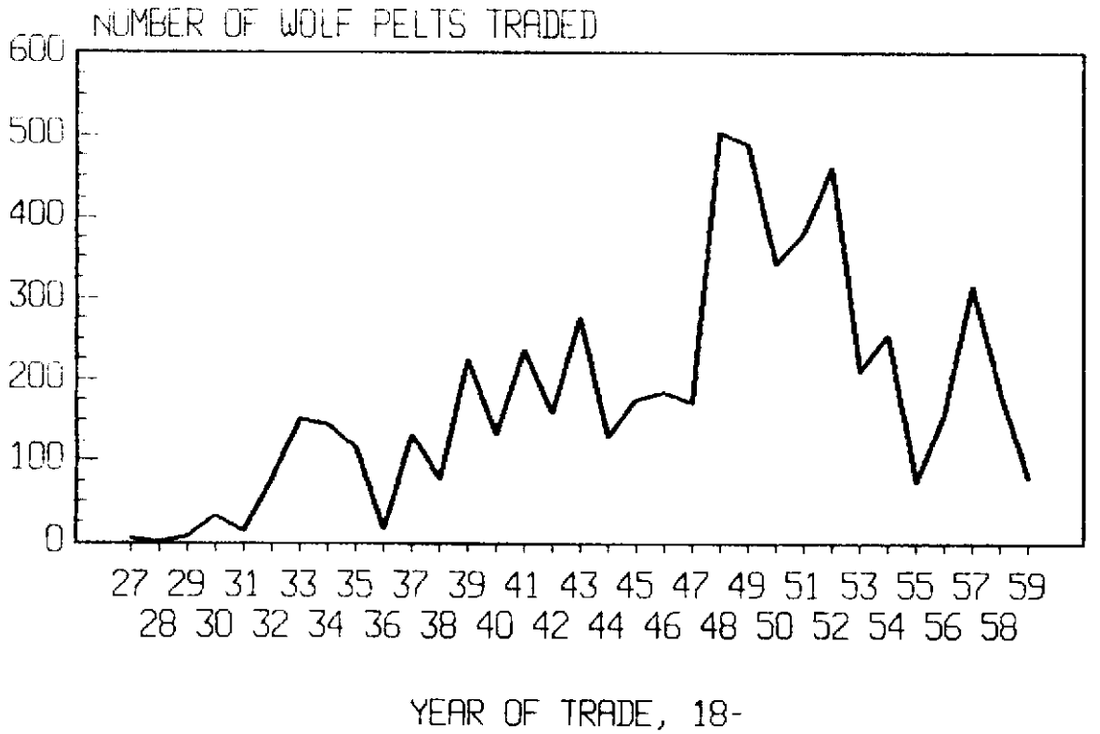


Fig. 6. Fort Colville; a total of 5,911 wolf pelts were traded.

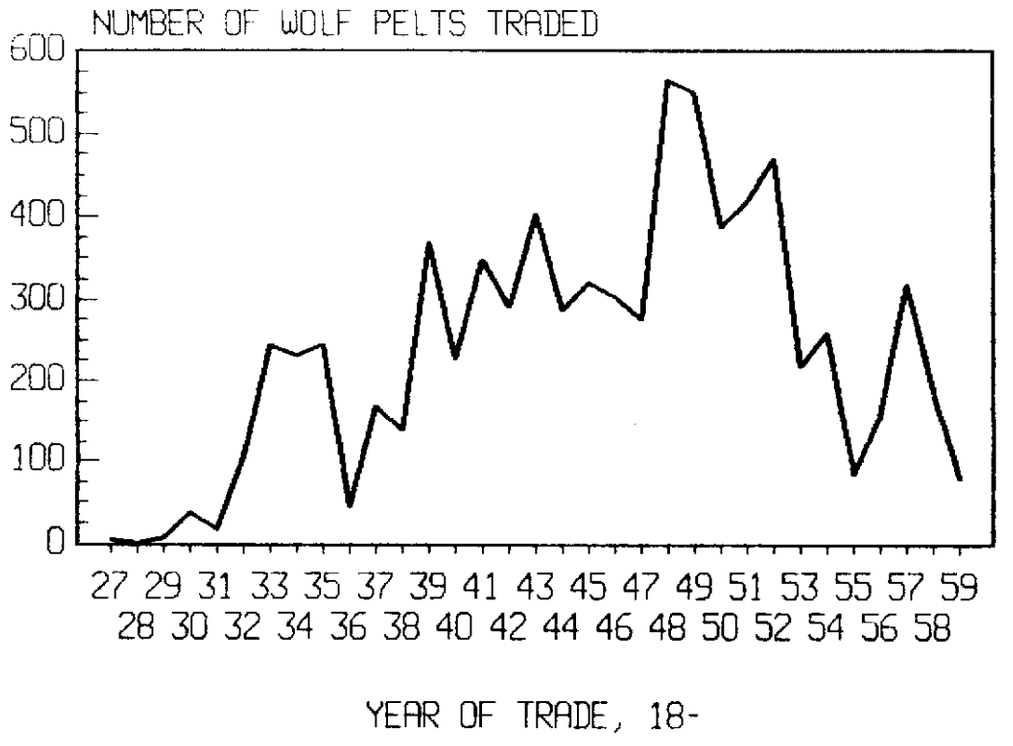


Fig. 7. Combined reports from Forts Thompson, Vancouver, Colville, and Nisqually; a total of 7,761 wolf pelts were traded.

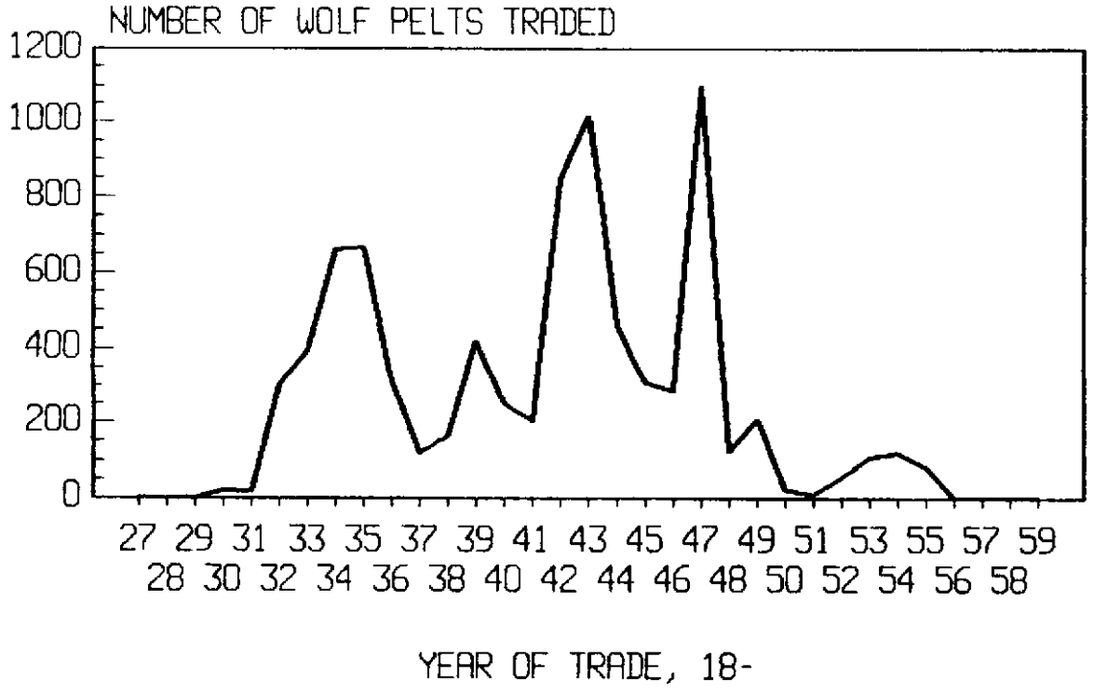


Fig. 8. Fort Nez Perces; a total of 8,234 wolf pelts were traded.

The results of the Hudson's Bay Company activities were felt by wildlife and Native American alike. "In little more than a generation, the traditional base of Indian life vanished. The fur traders equipped Indians with better weapons - guns, iron arrowheads, traps, and steel knives - that allowed hunters to deplete game faster; they goaded the Indians to trap fur-bearing animals well beyond their own needs. Some districts became barren because the cycle of reproduction was destroyed" (Fahey, 1986). Presnall (1946) described the changes associated with the fur trade as: "A wave of wildlife destruction spread westward ahead of the actual white frontier as tribe after tribe bartered the future breeding stock of its fur resources for the immediate advantages of possessing firearms and iron implements".

Research on other predators has added to the knowledge of the impact of the fur trade. Sullivan (1983) in research on grizzly bears (Ursus arctos) documented the major impact of the Hudson's Bay Company for the time period of 1820 to 1860. This study showed large numbers of grizzly bears taken for their furs, (e. g., 382 pelts from Fort Colville in one year).

4. Explorers and Settlement

The first white men to write about the Cascades wolf were Lewis and Clark in 1805-06. They referred to it as the "large brown wolf" said to inhabit "California and the banks of the Columbia" River. They noted that "seven elk killed by their hunting party were untouched by the wolves, of which indeed there are but few in this country", referring to the area around Fort Clatsop (near the mouth of the Columbia River) (Young 1944).

It appears the first white to kill a Cascades wolf was Alexander Ross, in 1814 (Dryden 1949). In his journals of exploration in the North Cascades, he reported shooting a wolf near the Fort at Okanogan, and taking one near She Whaps (directly north of the study area).

The first white man to record specific information on the Cascades wolf was probably David Douglas in 1825. According to his journal he procured in the summer of 1825 a "new species of Canis" from close to the Willamette River, in what was to become Oregon (Lewis and Clark 1904-05).

The Cascades wolf received the scientific name Canis lupus fuscus from Richardson in 1829, based on the "large brown wolf" description of Lewis and Clark (Young 1944).

Admiral Charles Wilkes in 1841 wrote about Fort Vancouver and a wolf problem that necessitated bringing in from the field "large numbers of cattle...for in consequence of the numerous wolves that are prowling about; in some places it becomes necessary for the keeper to protect his beasts even in the daytime" (Young 1944).

Predation by wolves in the mid-1800's apparently had both economic and political implications to the settlers. On February 2, 1843, the first "Wolf Meeting" was called to establish bounties on wolves. It appears the real intent of the meetings were to establish the Oregon Territory, but "wolves drew pioneer leaders of the Northwest together as did no other objective" (Young 1944). The meetings led to the establishment of both a $5.00 wolf bounty, and the Oregon Territory, which was later divided, with Washington Territory occupying the area later to become Washington State.

Suckley (1860) who wrote about the Nisqually area found wolf control effective, at least in certain areas where the wolf was "formerly...quite abundant... not of late years, owing to the persuasive influence of strychnine, they, together with the wolf-like Indian dogs, have become quite scarce".

In 1897 Dr. C. Hart Merriam examined the hide of a wolf poisoned a few years earlier south of Longmire. Residents reported that wolves were only rarely found in the general vicinity. The animals were thought to more common near the mountain than in the Nisqually Valley (Taylor and Shaw, 1927).

5. Territorial Bounty Records

The Washington territorial predator control act of November 29th, 1871 provided for bounties on most predators in the Washington territory. A summary of the register of Territorial Warrants is presented in Table 2. A total of 20 wolves were taken for bounty. Most were from in or near the study area.

Table 2. Register of Territorial Warrants, 1872-1874.

Date	Location	Bounty Paid
April 13, 1872	Pierce Co.	3 Cougars, 2 Wild Cats
April 25, 1872	Mason Co.	2 Cougars, 1 Wild Cat
May 21, 1872	Thurston Co.?	4 Wild Cats
June 19, 1872	King Co.	1 Cougar, 1 Wild Cat
August 20, 1872	Thurston Co.	3 Cougars, 6 Wild Cats
November 27, 1872	Lewis Co.	1 Cougar
February 13, 1873	Clallam Co.	3 Cougars, 1 Wild Cat
February 27, 1873	Washington T.	16 Coyotes
May 17, 1873	Clark Co.	2 Cougars
May 19, 1873	Washington T.	1 Cougar, 1 Black Wolf
July 9, 1873	Klickitat Co.	7 Gray Wolves, 12 Coyotes
July 9, 1873	Klickitat Co.	5 Gray Wolves, 10 Coyotes
October 11, 1873	Klickitat Co.	2 Gray Wolves, 27 Coyotes
November 3, 1873	Pacific Co.	2 Wolves, 1 Wild Cat
December 10, 1873	Washington	2 Wolves, 1 Wild Cat
February 10, 1874	Washington	1 Grey Wolf, 6 Wild Cats

6. U.S. Biological Survey

The first research on wolf control by the Department of Agriculture, occurred in the West during 1914-15. On July 1, 1915, $125,000.00 in federal funds were designated for "predator control" on national forests and other public lands. During 1916 the Biological Survey expanded the program to include private lands. By the fiscal year of 1928, the Biological Survey employed 500 hunters organized in some 14 districts, including Washington state (U.S. Congress 1929).

A letter from the Secretary of Agriculture to Congress explained the work of the Biological Survey as "one of suppression and control from the start, rather than one of complete eradication of species" (U.S. Congress 1929).

Records from Washington state in 1924 describe a somewhat different program: "during September, 23 federal, State and Cooperative hunters worked a total of 653 days. We expect every man to put out all the poison baits possible...to cover the greatest possible area ...to use it in all sections where the work can be carried on without endangering dogs and domestic animals....our first duty is to get rid of all the predatory animals possible" (Bach and Dobyns, 1924).

A review of the records of one of the "hunters" reveals the level of poisoning that occurred in the Cascades area . During December 1924, one agent alone, placed 925 poison baits, in addition to killing five horses for "poison stations".

U.S. Biological Survey records indicate that only 2 wolves were killed by their hunters in Washington state between 1915 and 1929 (U.S. Congress 1929).

7. The Cascades Wolf in Recent Literature.

According to Anderson (1943), Dalquest (1948), Goldman (1944), Hall (1981), Nowak (1979), and Young (1944), the Cascades wolf was historically found throughout the Cascade Range in both Oregon and Washington.

In 1927 wolves in the Mount Rainier National Park area were thought to have an "unknown" range and were "doubtless rare and of irregular occurrence" (Taylor and Shaw, 1927).

Young in 1944 estimated that 10 wolves lived on United States Forest Service lands in Washington state.

Booth in his 1947 research on the land mammals of Washington reported the Cascades wolf as "found formerly throughout the western part of the state; now greatly restricted, if present at all". He felt, although records were scant, that accounts indicated the wolf was rather common in the past.

Dalquest, in his survey of Washington mammals, wrote that early settlers found wolves to be common and a "serious" pest and by 1900 they had nearly disappeared. In the settled parts of western Washington "they were doubtless exterminated at an early date". He felt that probably only a few wolves still existed in remote places. "The wolf no longer is an important element in the mammalian fauna of Washington... The species, like the grizzly bear, is nearly extinct in the state" (Dalquest 1948).

Schamberger (1970) wrote about the Mount Rainier National Park: "at present, the wolf is thought to be absent from the park, but may perhaps wonder down from the North Cascades in the future".

In their research on the Mt. Baker-Snoqualmie National Forest, which comprises a large portion of the study area, Payne and Taber (1973) reported: "apparently never abundant in Washington, the wolf had disappeared from most areas of the state by 1910. The present distribution reportedly occupies those portions of the North Cascades, Ferry, and Stevens counties, bordering British Columbia". They stated sighting reports from the area "suggest that the wolf still occurs in limited numbers in this region. When we played recorded wolf howls near supposed sighting areas, however, we were answered only by coyotes. So the presence of the wolf in our study area still remains unverified".

The Big Game Status Report (W.S.D.G. 1975) discusses two wolves being killed in 1975. The first was killed in Douglas County, to the east of the study area, on January 5, after it killed three calves. This animal was identified as a Canis lupus columbianus, the British Columbia wolf. The second was a captive wolf that escaped and was killed by the owners of a goat which it had preyed upon. The conclusion of the Department's report was that "wolves may still be present in Washington, but that presence is represented by very small numbers, if at all. The wolf kill in Douglas County may have been a wild animal, but Canadian authorities cannot verify the possibility of its coming from adjacent ranges in British Columbia" (W.S.D.G. 1975).

Pisano (1977) found that Canis lupus fuscus had become extinct throughout its former range in the northwestern U.S. and was confined to the northern limits of its former range in B.C. In 1978 Pisano described the "ambitious" control campaigns of B. C. during the 1950's that greatly reduced both wolf numbers and range. Apparently when control was reduced, columbianus invaded much of the Cascades wolf's former range. Additionally, "genetic diffusion between the two subspecies, and occasionally with domestic dogs, is a further threat to such remnant fuscus populations as may exist". The Cascade wolf "can safely be assumed to be a subspecies in peril, if it is not altogether extinct".

In her thesis research Laura Friss (1985) studied subspecific relationships of wolves in British Columbia. Like Pisano, Friss doubts the survival of fuscus: "Those wolf types designated Canis lupus fuscus and C. l. irremotus appear to be extinct".

B. Present Status

1. Recent Washington Sighting Reports

The earliest collection of wolf sighting reports in the study area is from Mt. Rainier National Park. Records have been maintained by park officials since 1897. Sparsely detailed reports of sightings appear since then, roughly at the rate of 2 or 3 per decade until the 1960's, when the numbers increased. Payne and Taber (1974) made the first attempt to solicit and analyze wolf reports in the study area, although their contract was limited to the Mt. Baker-Snoqualmie National Forest. Reports including varying degrees of detail have also been collected by biologists of the North Cascades National Park and some of the national forests in the study area.

The Washington Department of Wildlife (formerly Department of Game) began to maintain the state's only centralized collection of wolf sighting reports in 1979. The collection contains reports dating back to 1946. The authors have also received other reports which are not in the Department's database. The frequency of all known reports from the study area for the years 1946-1988, is shown in Table 3.

Table 3. Total wolf reports from all sources for Cascades area (1946-88).

Year	Number Reported
1946	1
1947	1
1948-49	0
1950	0
1951	1
1952-54	0
1955	1
1956	1
1957-59	0
1960	1
1961	0
1962	4
1963	0
1964	1
1965	0
1966	2
1967	1
1968	1
1969	0
1970	3
1971	2
1972	4
1973	4
1974	2
1975	2
1976	3
1977	1
1978	4
1979	3
1980	1
1981	2
1982	1
1983	2
1984	6
1985	2
1986	6
1987	13
1988	7
	N= 83

The total of 83 reports from the study area comprise 70% of the 119 reports from the entire state during the same time period.

There were a total of 49 reports between 1973-1988, from the study area. The authors were able to contact 21 of the observers. In addition, 10 new reports were collected. This total of 31 observers were interviewed regarding their sightings (Appendix 2). Of the reports, 19 (61%) were rated as probable (Table 4), and 12 (39%) were rated as possible. Most of these reports were of single animals (Table 5).

Table 4. Number of probable wolf reports (1973-1988).

Year	Number of Reports
1973-77	0
1978	1
1979	1
1980	0
1981	0
1982	1
1983	3
1984	1
1985	0
1986	2
1987	7
1988	3
	N= 19

Table 5. Groupings of wolves observed (1973-1988).

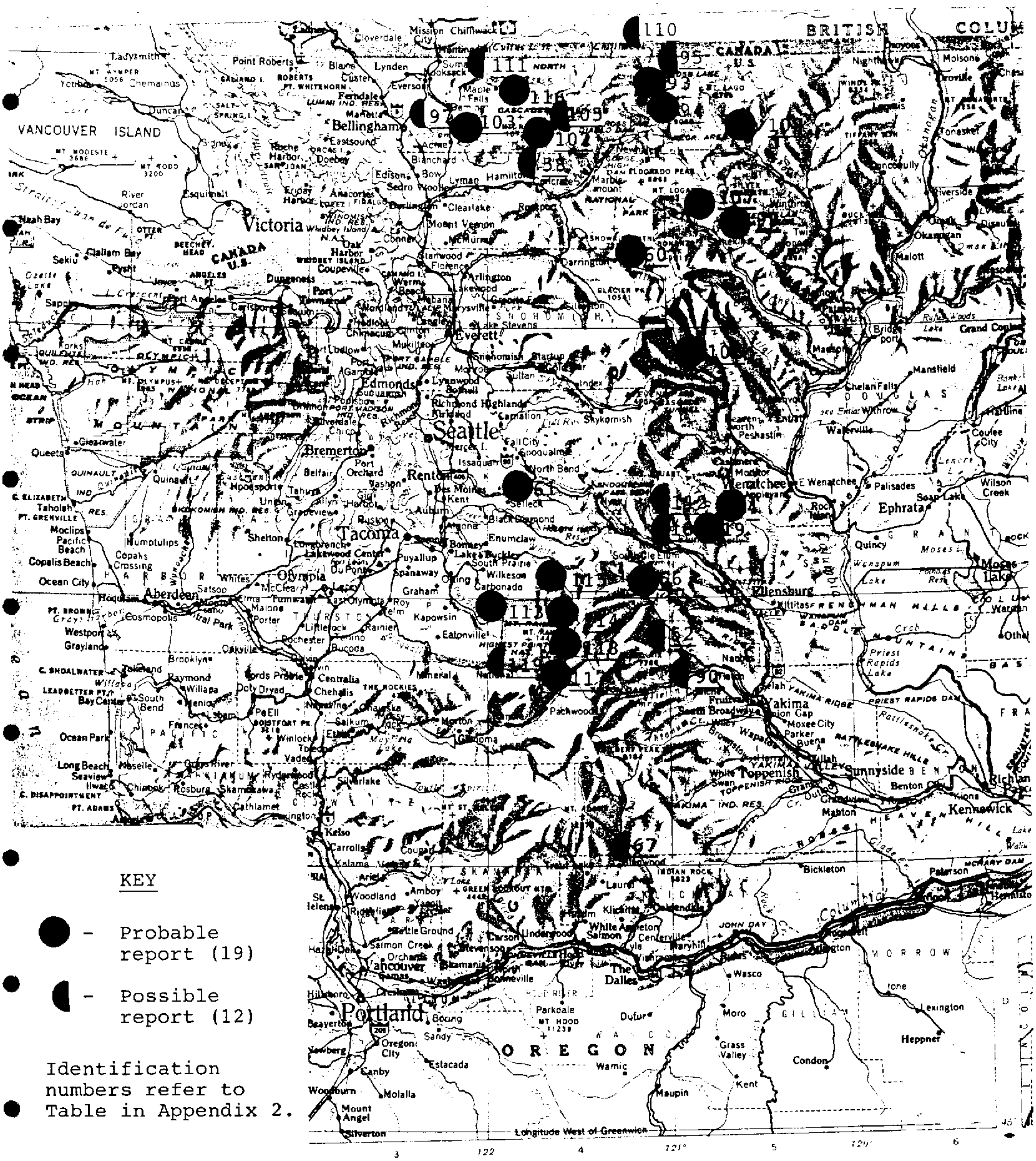
	Rating		
No. of wolves	Probable	Possible	Total
Single	15	9	24 (77%)
Pairs	2	3	5 (16%)
Group (>2)	2	0	2 (07%)
	19	12	31 (100%)

In comparison, for northeastern Washington Hansen (1986) analyzed 24 wolf reports for the years 1974 through 1986 and found 11 probable and 13 possible reports.

Geographical concentration of the analyzed reports from the study area was found near Baker Lake and Ross Lake in the North Cascades region and near Mount Rainier in the southern Cascades region (Figure 9).

FIGURE 9.

GEOGRAPHIC DISTRIBUTION OF ANALYZED REPORTS (1973-1988).



KEY

● - Probable report (19)

◖ - Possible report (12)

Identification numbers refer to Table in Appendix 2.

2. Recent Southern British Columbia Sighting Reports

Barnard (1986) reported four wolf sightings in the Skagit River watershed of British Columbia, immediately to the north of the Washington border (Table 6). These reports were rated by Barnard, using an unexplained system.

Table 6. Wolf Reports from the Skagit River watershed (1980-1986).

Date	Location	Details	Reliability
Sept., 1980	Maselpanik Creek	Wolf feeding on deer gut pile.	"Probable"
Fall, 1982	Shawatum Creek	Grey-black wolf observed.	"Probable"
Dec., 1985	Silverhope-Skagit Road	Observed by logger "very large animal".	"Probable"
May, 1986	Ross Lake	Wolf observed in vicinity of deer carcass.	"Confirmed"

Barnard also noted there had been at least nine observations of wolf tracks in the area between 1979 and 1986. During the winter of 1985-1986 a trapper reported "temporarily catching a wolf" (Barnard, 1986).

Due to the number of sightings and occurrence of signs since 1980 Barnard concluded that wolves had become established in the Skagit River drainage area. "The present population is low and is estimated at four animals" (Barnard, 1986). The last reported sightings of these wolves was in 1987, suggesting that the animals may have left the area or perished (Barnard, 1988).

According to Forbes (1989) and Low (1989) the current southernmost range of known wolf packs to the north of the study area is as generally depicted in Figure 10.

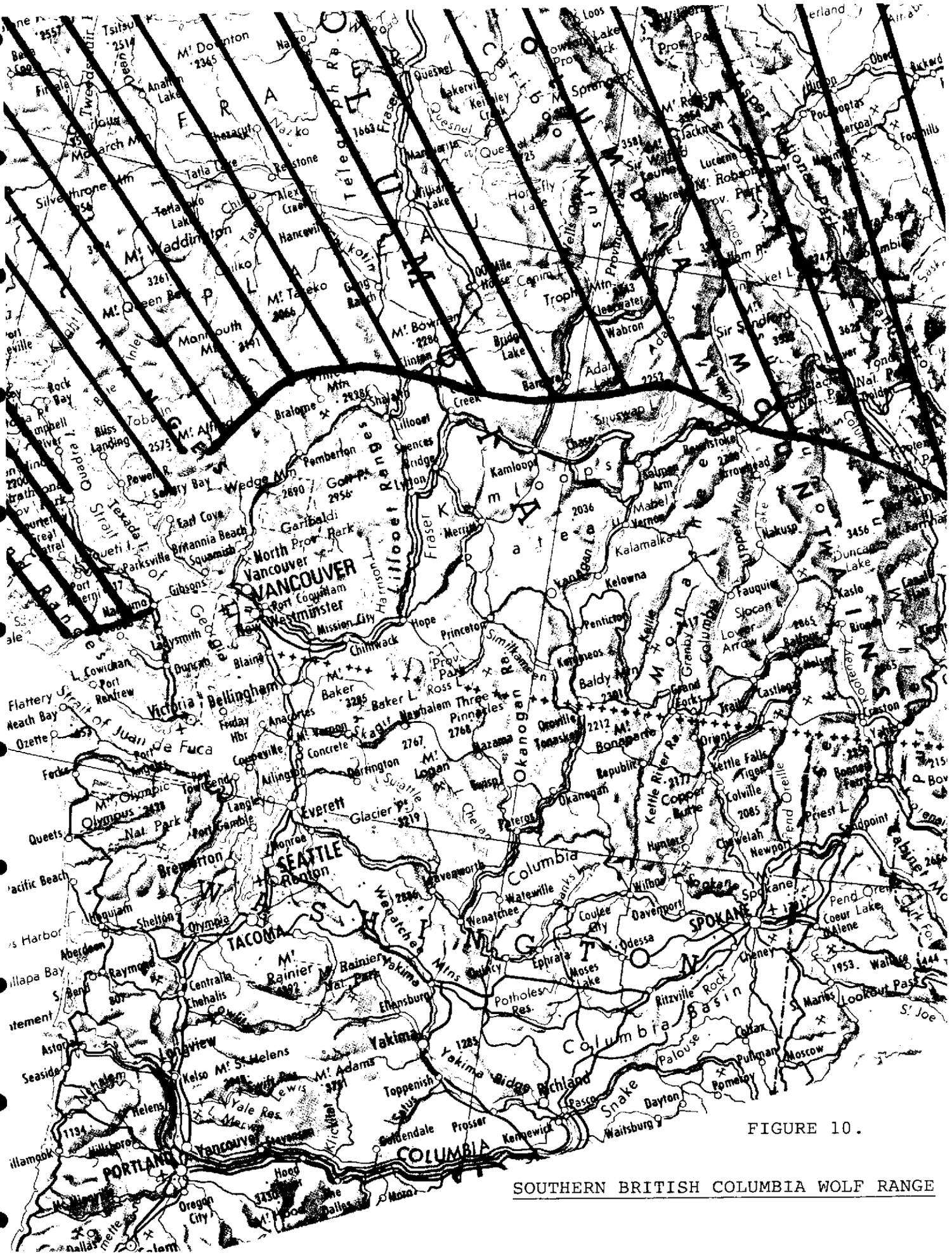


FIGURE 10.

SOUTHERN BRITISH COLUMBIA WOLF RANGE

V. DISCUSSION

The Cascade Mountains wolf (Canis lupus fuscus) inhabited the study area for thousands of years, until the early 1900's. Early reports indicate the wolf was sighted throughout this area. The reports by early explorers concerning wolves vary greatly, possibly reflecting a biased observer. This makes quantitative interpretations of words such as "numerous" or "scarce" difficult.

The tribes associated with the Cascades underwent significant changes in the 1700's. The introduction of the horse increased both the efficiency of the natives as hunters, and the area they could hunt. This probably led to additional hunting pressure on wolves in the area.

Hudson's Bay traders found the natives eager for the commodities that trading furs could buy. A system of trade was established for wolf pelts by 1827. Records indicate a cycle of trading furs which peaked at each station after 5 to 15 years, then declined.

The result was probably a great reduction of wolf populations, if not eradication in many areas. Between 1827 to 1859, over 7,700 wolf pelts were traded from in or near the study area. The last record of the trade of wolf pelts in the Thompson River area was in 1852; 1857 for Fort Vancouver; and 1858 for Ft. Nisqually. The only Cascade area to trade in wolf pelts during 1859 was Fort Colville with 78. Fort Nez Perces in eastern Washington had a similar pattern as a total of 8,234 pelts were traded, but none after 1855.

Early white settlers perceived the wolf as an economic threat due to possible predation on livestock. Organized efforts to eradicate wolves in the Oregon Territories date back to the 1840's. Strychnine was commonly used and resulted in the reduction or elimination of wolf populations.

The Register of Territorial Warrants indicates that bounty hunters were active in many parts of the region in 1872-74. Although there was an economic incentive to trap or shoot wolves, only 20 were bountied. From 1915 to 1929 several Bureau of Biological Survey "hunters" were working in the Cascades, placing large quantities of poisons and trapping. The state-wide "campaigns" resulted in the destruction of over 28,000 coyotes, 1,200 bobcats, yet only 2 wolves. The results of both programs suggest a great previous reduction in both wolf numbers and distribution.

The recent literature contains some references to wolves in the Cascades, usually that of a single wolf sighted. A few of the authors felt the wolf still remained, but none was able to provide documentation of breeding residents.

A review of all sightings (83) since 1946 from the Washington state portion of the study area shows an increase of reports from the 1940's to present, with 31% (26) occurring between 1986-1988. Of the reports (since 1973) which were rated for reliability and considered probable, 12 of 19 (63%) occurred between 1986-1988. The majority of the sightings were of single wolves (77%), with only 2 (7%) groups reported.

Geographically, clusters of reports are found near Baker and Ross Lakes in the North Cascades, and near Mt. Rainier.

Recent wolf reports from the southern British Columbia portion of the study area suggested the presence of a small pack (4 animals) in 1986, but the current status of these animals is not known.

The recent reports from the southern British Columbia portion of the study area, together with the trend of increasing numbers of probable reports in the Washington state portion, suggest that wolves may currently be recolonizing the Cascade Range.

VI. Recommendations

Additional research is necessary to determine whether any wolf packs exist in the study area and to determine the current suitability of the Cascades as wolf habitat.

In view of the facts that: 1) Canis lupus inhabited the study area prior to its decimation in the 1800's, and 2) the study area is in proximity to established wolf range in southern British Columbia; the conclusion of the authors is that wolf recolonization of the Cascade Range of Washington may occur in the future if it has not already. The authors recommend that additional research and planning should be conducted by an adequately funded wolf recovery team pursuant to the Endangered Species Act of 1973.

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LITERATURE CITED

Amoss, P. T. 1978. Coast Salish spirit dancing. PhD dissertation, Univ. of Washington. Seattle, WA.

Anderson R. 1943. Summary of the large wolves of Canada, with description of three new arctic races. Journal of Mammalogy, 24: 386.

Bach, G. R. and H. W. Dobyns. 1924. Hunter's news letter - Washington District. Washington State Department of Agriculture, Bureau of Biological Survey. Olympia, WA.

Barnard, T. 1986. Current population status of black bear, grizzly bear, cougar and wolf in the Skagit River Watershed. Fish and Wildlife Branch, Ministry of Environment. British Columbia, Canada.

Barnard, T. 1988. Personal communication.

Booth, E. S. 1947. Systematic review of the land mammals of Washington, Part 2. PhD. dissertation. State College of Washington.

Brooks J. E. (editor). 1961. The Oregon almanac, 1961-1962. Binfords and Mort, Publishers. Portland, OR.

Dalquest, W. W. 1948. Mammals of Washington. Univ. of Kansas Publications. Lawrence, KN.

Dratch, P. et al. 1975. A case study for species reintroduction: the wolf in Olympic National Park, Washington. The Evergreen State College. Olympia, WA.

Dryden C. 1949. Up the Columbia for furs. The Caxton Printers, Ltd. Caldwell, ID.

Fahey, J. 1986. The Kalispel Indians. Univ. of Oklahoma Press. Norman, OK.

Forbes, R., D. 1989. Personal communication.

Friss, L. K. 1985. An investigation of subspecific relationships of the grey wolf, Canis lupus, in British Columbia. M.S. thesis. Univ. of Victoria. Victoria, British Columbia, Canada.

Fritts, S. H. and L.D. Mech. 1981. Dynamics, movements and feeding ecology of a newly protected wolf population in northwestern Minnesota. Wildl. Monogr. 80. Wildl. Soc., October, 1981.

Goldman, E. A. 1944. The wolves of North America, Part II. Classification of wolves. The Amer. Wildl. Instit. Washington, D.C.

Hall, R. 1981. The mammals of North America. John Whiley and Sons. New York, NY.

Hansen, J. 1986. Wolves of Northern Idaho and Northeastern Washington. Montana Coop. Wildlife Research Unit. U.S. Fish and Wildlife Service. Missoula, MT.

Hebert, D. M., et al. 1982. Preliminary investigations of the Vancouver Island wolf prey relationships. In: F. H. Harrington and P. C. Paquet, eds. Wolves of the world. Noyes Publ. Park Ridge, N.J.

Lewis, M. and W. Clark. 1904-05. Original journals of the Lewis and Clark expedition, 1804-06. 8 vols. Edited by Reuben Gold Thwaites. New York, NY.

Low, D. 1989. Personal communication.

Mech, L.D. 1970. The wolf. Natural History Press. Garden City, NY.

Nowak, R.M. 1979. North American Quaternary Canis. Museum of Natural History, University of Kansas. Monograph #6. Lawrence, KN.

Nowak, R.M. 1983. A perspective on the taxonomy of wolves in North America. Pages 10-29 in Wolves in Canada and Alaska. Canadian Wildlife Service Report Series #45. Canadian Wildlife Service. Ottawa, Canada.

Nowak, R.M., and Paradiso, J.L. 1983. Walker's Mammals of the World. John Hopkins University Press, Baltimore, MD.

Payne, N. F. and R.D. Taber. 1974. Current status of ten uncommon birds and mammals in Snoqualmie National forest and vicinity. U.S. Forest Service, Contract No. 004118 N. Portland, OR.

Peterson, R. O., J. D. Woolington, and T. N. Baily. 1984. Wolves of the Kenai Peninsula, Alaska. Wildl. Monogr. 88. Wildl. Soc.

Presnall, C. C. 1946. Wildlife conservation as affected by American Indian and Caucasian concepts. J. Mammal. 27:458.

Pisano, R. 1977. Status of the wolf in North America. Internationale Union for Wildlife Conservation.

Pisano, R. 1978. The history and status of the Cascade Wolf (Canis lupus fuscus): A review of an unrecognized endangered subspecies. University of Washington. Seattle, WA.

Ray, V. F. 1932. The Sanpoil and Nespelem: Salishan peoples of Northeastern Washington. Univ. Washington Press. Seattle, WA.

Ream, R., M. Fairchild, and D. Boyd. 1985. Wolf Ecology Project. Progress (Annual) Report. Univ. of Montana, Missoula, MT.

Schamberger, M. L. 1970. Mammals of Mount Rainier National Park. PhD. dissertations. Oregon State Univ. Corvallis, OR.

Scott, J.W. 1988. Personal Communication.

Scott, J.W., and R.L. De Lorme. 1988. Historical Atlas of Washington. University of Oklahoma Press. Norman, OK.

Suckley, G., and G. Gibbs. 1860. Reports of explorations and surveys to ascertain the most practical and economical route for a railroad from the Mississippi River to the Pacific Ocean 1853-55. 36th Cong., 1st sess., Senate Ex. Doc. No. 56, vol. 12.

Sullivan P. T. 1983. A preliminary study of historic and recent report of grizzly bears, Ursus arctos, in the North Cascades area of Washington. Washington Department of Game. Olympia, WA.

Taylor, W. P. and W. T. Shaw. 1927. Mammals and birds of Mount Rainier National Park. U. S. Gov. Printing Office. Washington, D.C.

Thiel, D. 1988. Wolf recovery plan environmental assessment. Wisconsin Dept. of Natural Resources (unpublished) Madison, WI.

United States Congress. 1929. Control of predatory animals. 70th Cong., 2nd sess., House Doc. No. 497. United States Gov. Printing Office. Washington, D.C.

United States Fish and Wildlife Service. 1987. Northern Rocky Mountain Wolf Recovery Plan. U.S. Fish and Wildlife Service. Denver, CO.

Washington Department of Game. 1975. 1974-1975 Big Game Status Report, wolf section. Washington Department of Game publication. Olympia, WA.

Weaver, J. 1978. The Wolves of Yellowstone. Nat. Park Service - Nat. Res. Rept. 14. U.S. Gov. Printing Off. Washington, D.C.

Young, S. P. 1944. The wolves of North America, Part I. Amer. Wildl. Instit. Washington, D. C.

Young, S.P. 1946. The wolf in North American history. Caxton Printers, Ltd., Caldwell, ID.

APPENDIX 1

Revised 5/87

WOLF OCCURRENCE REPORT

ST. Year - No. in Year

	Observer	Reporter
Name		
Address		
Telephone	(___)_____	(___)_____
Occupation		

Date of Observation ___/___/___ (Year Mo. Day) Time: _____

Township _____ UTM Zone _____

County: _____ Range _____ OR UTM East _____

Section _____ UTM North _____

Land Ownership: USFS ( ) Forest _____ State _____

BLM ( ) District _____ Private _____

NPS ( ) Park _____ _____

BIA ( ) Reservation _____ Other _____

Name and Description of Location/Habitat: _____

_____

Elevation: _____ Hydro Unit: _____

Observation Type: Live Animal ( ) Howling ( ) Tracks ( ) Scat ( )

Dead Animal ( ) Scentpost ( ) Kill ( ) Den ( ) Other ( )

Observation By: Binoculars ( ) Riflescope ( ) Magnification _____ X

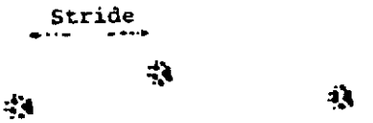
Naked Eye ( ) Other ( ) _____

Number of Animals: Seen _____ Esitmated _____

Description of Animal(s):	1	2	3	4	5	6
Color/Markings:						
Est. Shoulder Height:						
Est. Weight:						
Position of Tail: (down, straight out, high, curled)						

Distance Between Observer and Animals: _____ Length of Observation: _____

	1	2	3	4	5	6
Track Size:						
Length:						
Width:						
Claws Distinct?:						
Length of Stride:						



Diameter of Scat _____

Length/Description of Howling: _____

CHARACTERISTICS TO INDICATE WOLF RATHER THAN DOG OR COYOTE: _____

_____

_____

_____

DETAILED ACCOUNT OF OBSERVATION: _____

_____

_____

_____

_____

Rating: 1 2 3 4

fold here

Appendix 2.

Summary Table for Rated Wolf Observations in Study Area - 1973-1988.

Note: Report numbers refer to Washington Wolf Project numbering system. Rating was according to Weaver (1978). Boldface type indicates "probable" rating; others are "possible". More detailed information about these observations is available from the authors.

Report Number	Observer(s)	Date	General Location
04	**K., M. Peterson**	**04/--/78**	**Blewett Pass**
18	D. Clayton	06/--/73	N. Fork, Teanaway R.
19	**C. Martin**	**11/13/79**	**Teanaway Ridge**
52	M. Wischnofske	03/--/74	Bumping River
58	T. Hamer	06/15/84	Baker Lake
60	K. Vergowe	05/31/86	Green Mountain
61	**R. Robertson**	**09/--/83**	**North Bend**
66	**R. and C. Juge**	**06/15/86**	**Taneum Ck. Canyon**
67	**H. Cole**	**11/9/82**	**Conboy N.W.R.**
90	R. Running	01/10/87	White Pass
93	**J. Jarvis**	**01/11/87**	**Ross Lake**
94	**U. Nehring**	**01/11/87**	**Ross Lake**
95	B. Mierendorff	04/2/87	Ross Lake
97	A Frederick and D. Bigelan	12/20/87	Lake Whatcom
99	**R. Murray**	**07/--/87**	**Twisp Pass**
102	**R. Blood**	**06/30/87**	**Baker Lake**
103	**D. Bailey**	**07/12/87**	**Mt. Baker**
105	N. and V. Carter	09/--/87	Baker Lake

106	**B. Bolding**	**10/10/87**	**Chiwawa River**
107	**R. Watkins**	**09/--/83**	**Black Peak**
108	**S. Fry**	**07/09/88**	**Mt. Lago**
110	D. Harry	06/03/88	Ross Lake
111	D. Lamore	10/--/79	Canyon Ridge
112	C. Heath	09/00/88	Blewett Pass
113	**J. Passmore**	**03/10/84**	**Mt. Rainier NP**
114	**F. Wierleski**	**12/11/87**	**Mt. Rainier NP**
115	**F. Wierleski**	**02/--/88**	**Greenwater**
116	**R. Pullar**	**--/--/83**	**Pinus Lake**
117	**F. Wierleski**	**02/05/86**	**Mt. Rainier NP**
118	**M. Sieloff**	**05/13/88**	**Cayouse Pass**
119	B. and L. Brown	10/02/88	Mt. Rainier NP