

MEMORANDUM

TO Ecological Reserves  
Land Management Branch  
Dept. of Environment

Attn. J. Pojar

PARKS BRANCH  
DEPARTMENT OF RECREATION AND CONSERVATION  
OFFICE OF Interpretation Assessment  
2-6-12-73

June 22 , 76

Skagit Valley Interpretation Assessment Report

As you requested we are herewith sending you photocopies of our Skagit Valley report.

We wish to emphasize that Part 2, "The Concept for Interpretation of the Skagit Valley Recreation Area", is a draft copy and as such its recommendations are to be regarded as preliminary.

As the report contains planning proposals and recommendations our policy is to treat it as an in-house document within the B. C. Government service.

We hope the report proves helpful to you.



Leon Pavlick  
Interpretation Assessment

Encl.

LP:lh

INTERPRETATION ASSESSMENT SECTION  
INTERPRETATION DIVISION  
PARKS BRANCH  
DEPARTMENT OF RECREATION AND CONSERVATION  
VICTORIA, BRITISH COLUMBIA

ECOLOGICAL RESERVES COLLECTION  
GOVERNMENT OF BRITISH COLUMBIA  
VICTORIA, B. C.  
VBV 1X4

NATURAL FEATURE ANALYSIS OF  
THE SKAGIT VALLEY RECREATION AREA

PART 1 OF THE INTERPRETATION ASSESSMENT REPORT  
FOR THE SKAGIT VALLEY RECREATION AREA

MICHAEL EASTON  
November, 1975

T. E. LEE  
DIRECTOR  
PARKS BRANCH

TABLE OF CONTENTS

	<u>Page No.</u>
Introduction	1
A. Physiography	3
B. Bedrock Geology	4
C. Surficial Geology	6
D. Glaciation	8
E. Flora	9
References	17
Appendix I - Flora List of the Skagit Valley Recreation Area	18
Appendix II Vertebrate Species Recorded in the Skagit Valley in Canada	29

LIST OF FIGURES

- Figure 1            Physiographic Map of the Skagit Valley  
Recreation Area.
- Figure 2            Bedrock Geology of the Skagit Valley  
Recreation Area.
- Figure 3            Surficial Geology showing the landform-  
soil units of the Skagit Valley.
- Figure 4            Vegetation Associations and Habitats

## INTRODUCTION

The Skagit Valley Recreation Area was created under Section 6(1) of the Park Act on December 6, 1973. This area is bounded on the east by Manning Park, on the south by the International Boundary, on the west by the height of land that forms the easterly watershed boundary of the Maselpalik Creek and on the north by the easterly boundary of the watershed of Silverdaisy Creek to the summit of Silverdaisy Mountain, by the westerly corridor of Manning Park and by the southeast faces of Silvertip and Marmot mountains. The whole Recreation Area comprises 80,500 acres. The recreation area may eventually be expanded to include the whole of Silverdaisy Mountain and the other lands in this region which are at present subject to active mineral claims. (Turner, personal comm.)

The Skagit Valley Recreation Area may be reached by a wide, but rough, gravelled logging road which leaves the Trans Canada Highway just three miles south of Hope. Several trails also lead into the area: the Skyline Trail from Manning Park; the Whitworth Trail which follows along the Skagit River from the Hope-Princeton Highway; the Canadian Youth Hostel Association's Centennial Trail leading in from the Chilliwack Valley and the North Cascades Trail in Washington State which follows along Ross Lake for most of its length.

The Skagit River Valley has been one of the most studied semi-wilderness areas in British Columbia as far as plant and animal inventories and animal censuses are concerned. These studies were largely undertaken by the environmental consultant firm of Slaney and Co., who were retained by the Seattle City Light Corporation, the body applying to the American Federal Power Commission to raise the level of Ross Lake from 1602.5 feet above sea level to 1725 feet. The raising of the level by 122.5 feet would cause the impounding of 8 miles of Canadian territory by Ross Lake. Public pressure from both sides of the border forced the Seattle City Light Corporation to present an estimate of the environmental damage which would accrue through clearing and lake raising operations. Consequently, a great deal of data on the flora and fauna of the valley has been collected. Certain unique habitats of importance have had limited discussion in previous reports giving a biased interpretation of the Skagit Valley.

Consequently, the Skagit Valley Study Group prepared a report entitled "The Future of the Skagit Valley", which was submitted to the International Joint Commission, in order to balance earlier biased environmental assessments.

The Fish and Wildlife Branch has also collected census data on the fisheries, deer and game birds, particularly the grouse. As well, Thurber Consultants Ltd. have prepared a report on the geology of the Skagit Valley, as related to the stability of the shoreline in any future flooding.

Since most of the animal and plant inventory work had already been completed, my work was concerned mainly with the interpretive planning for the Recreation Area.

The first part of the report, dealing mainly with geology, flora and fauna, has borrowed heavily from the findings of others and these sources will be acknowledged accordingly. The second part of the report is the synthesis of plant and animal communities into interpretive regions, the regions being graded as to importance in terms of uniqueness or rarity. Also a system of trails has been drawn up which would enable the public to visit some extremely interesting interpretive areas, which otherwise would not be easily accessible.

A list of the flora and fauna of the Skagit Valley Recreation Area is presented in Appendix I and II respectively.

## A. PHYSIOGRAPHY (Figure 1)

The Skagit Valley Recreation Area lies entirely within the Cascade Mountains and contains part of both the Skagit and Hozameen Mountain Ranges. These two ranges are divided by the Skagit-Klesilkwa valley, the Skagit Range lying to the west and the Hozameen Range (Plates 1 and 2) to the east. The summits of the peaks of both these ranges gradually decrease in height from the area of the International Boundary northward. The major peaks of the Hozameen Range within the Recreation Area include Shawatum Mountain (7081'), and two unnamed peaks of 6602' and 7099', at the headwaters of Twentyeight Mile Creek. The Recreation Area contains the following peaks of the Skagit Range: Whitworth Peak (7525'), Silvertip Mountain (8500') (Plate 3) and Marmot Mountain (6700').

The valley floor of the Skagit from the border to a point 13 miles north is almost two miles wide (Plates 3 & 4). This broad U-shape is quite unique for a river valley so close to the lower mainland. About 1 mile north of the junction of the Klesilkwa and Skagit Rivers, the Skagit Valley narrows to a width ranging from 0.2 to 0.8 miles, extending for 8 miles until the Sumallo-Skagit confluence is reached. The Klesilkwa Valley also reaches a width of 1 to 2 miles to form a continuous broad valley basin (Plate 5) with the Skagit right up to the western boundary of the Recreation Area. The International Joint Commission (1971) reports that 10,550 acres of flat land exists in the lower Skagit and eastern Klesilkwa Valleys.

The International Joint Commission (1971) also reports that the Skagit River drops 425 feet over 20 river miles from the junction of the Sumallo and Skagit Rivers to Ross Lake, the slope of the valley being gentle but constant. The valley walls, on the other hand, tend to rise steeply from the valley floor at an average angle of 30 degrees. The average rise along the eastern slope is somewhat less because of a series of benches. Cairns (1923) has suggested that Silver Creek above Silver Lake was, at one time, a tributary of the Skagit, but because of recent tilting of a differential character, the Silver Creek drainage has been diverted entirely into the Fraser. This conclusion is based on an examination of the Silver, Klesilkwa and Skagit stream grades and on the observation of the increasing width of the valley bottom between Silver Lake and the divide between the Klesilkwa and Silver Creek Drainages.

## B. BEDROCK GEOLOGY

The major bedrock formations in the Skagit Valley Recreation Area are presented in Figure 1. Daly (1912) noted that the jagged peaks, narrow ridges and high precipices in the Skagit Range near the International Boundary are characteristic of weathered volcanic rocks. That the volcanic formation is at least 5,000 feet thick at the border and that the agglomerates possessed a certain coarseness indicated to him that the major eruptions actually took place in the border area from a large cone situated over the present site of Glacier Peak (not in the Recreation Area). At least 4000' of the formation is composed of massive breccias and ash-beds and contains one layer of coarse conglomerate with many interbedded flows of compact and vesicular lava. Daly (1912) writes that:

"It is seldom possible to distinguish the contacts between different flows, and even the contacts between flow and breccia are generally obscure. The more basic material of the breccias, ash-beds, and flows has great uniformity in composition belonging to the augite andesite group. The breccias and conglomerate beds contain many fragments and pebbles of quartzite, slate and granite which were probably derived from the eroded Hozameen series and the Custer gneissic batholith. If this is so, then the vulcanism dates from a more recent period than either the intrusion of the batholith or the folding of the Hozameen series of sediments."

Daly (1912) presents various arguments that could date the formation of the Skagit Volcanics at either the Oligocene, Eocene or Cretaceous, but no younger than the Miocene. The story of their formation is still incomplete.

The Hozameen series, so named by Daly (1912), is mainly composed of the great monocline of Cretaceous sediments. The mountains were apparently formed by the raising of a peneplane which subsequently became heavily eroded by the action of water and glaciers. This area has not yielded any fossils to date and so is thought by Daly (1912) to not be a part of the great inland sea, but perhaps a large delta area on its periphery. Fossils would, at any rate, be very difficult to locate because the rocks of the Hozameen series have undergone a great deal of deformation and metamorphism.

Camsell (1911) presents a concise report on the general geology of the Hozameen series.

"The Hozameen series consists of cherty quartzites, argillites, some limestone, and much volcanic material. The quartzites are thin-bedded, fine-grained rocks, usually bluish-grey in colour.



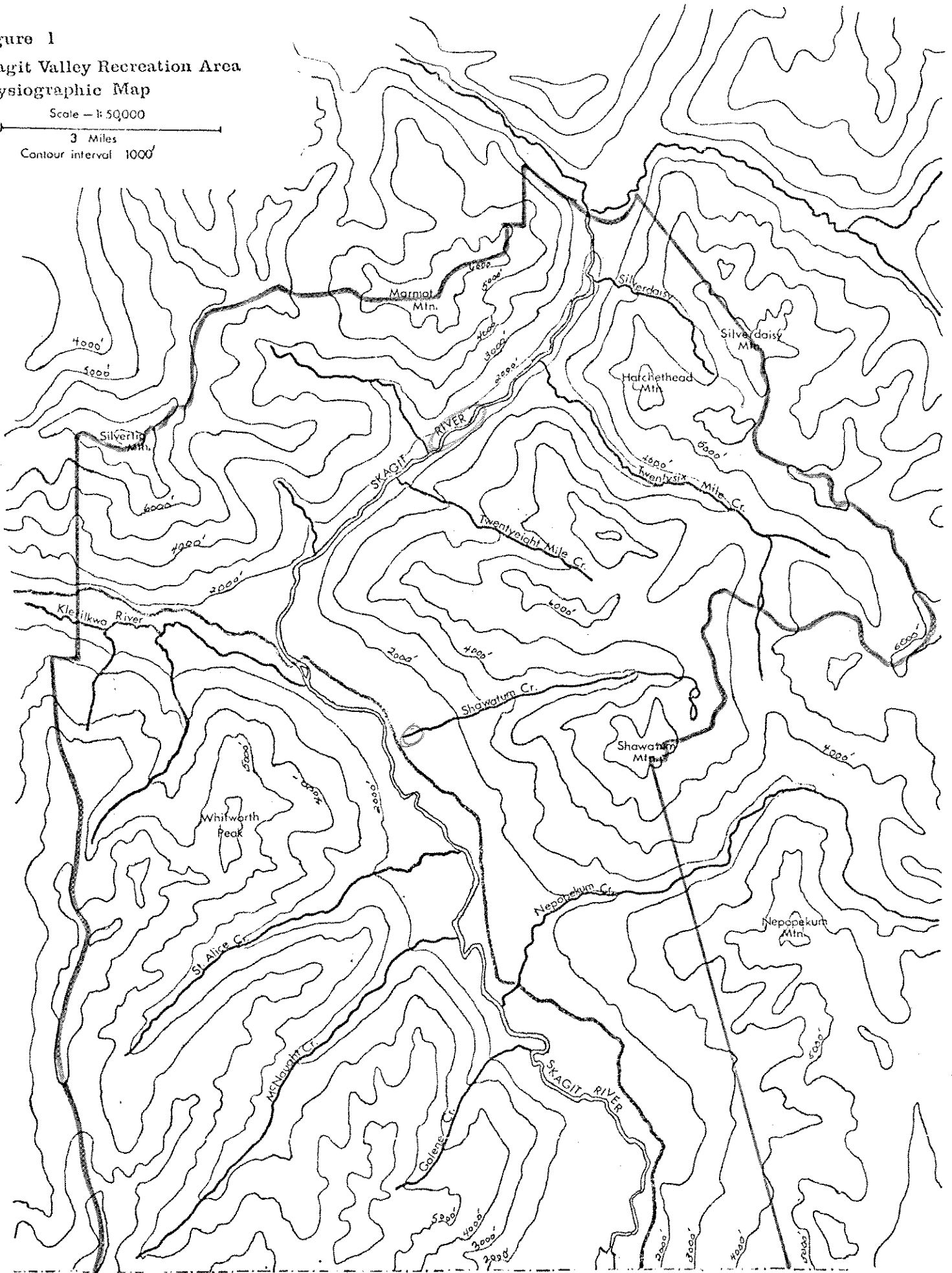
Figure 1

Skagit Valley Recreation Area  
Physiographic Map

Scale - 1:50,000

3 Miles

Contour interval 1000'



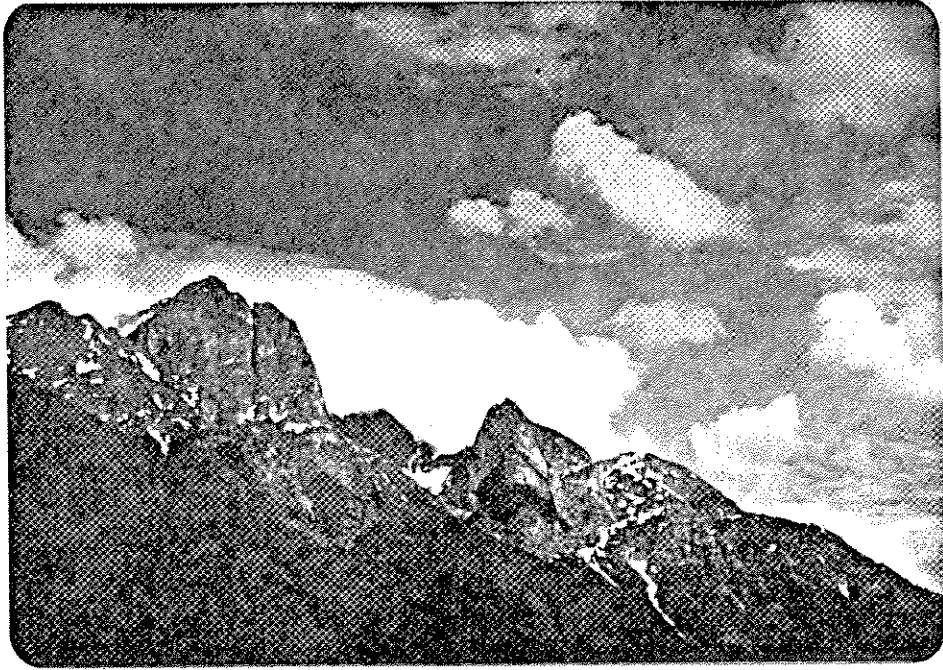


Plate 1. Mt. Hozameen dominates the view near  
Ross Lake

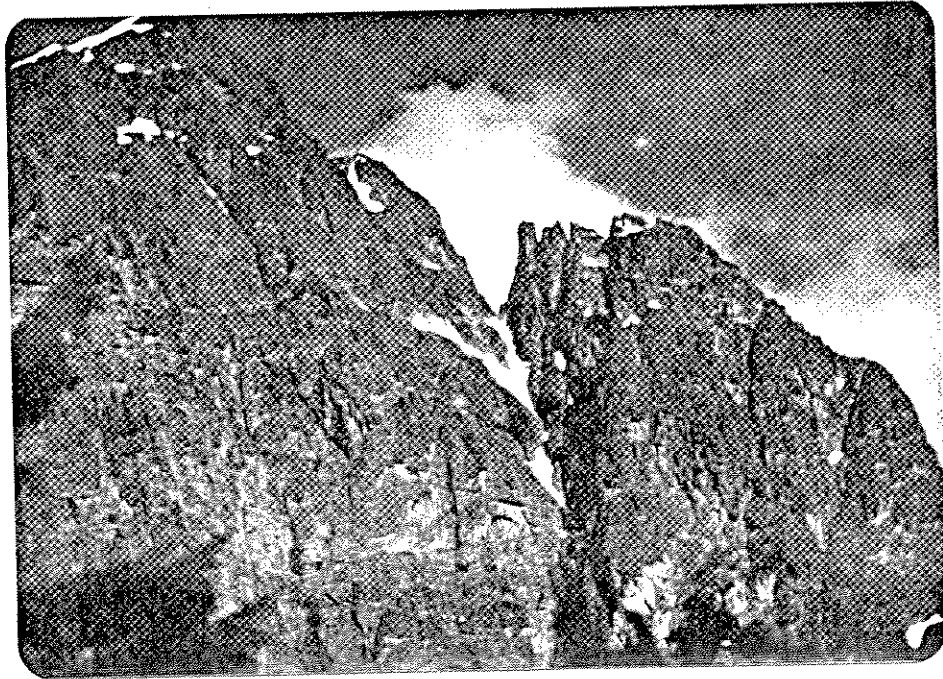


Plate 2. A telephoto view of the pinnacles of Hozameen  
as seen from Curly Brown's meadow



Plate 3. View looking north from Shawatum Creek Road, Silvertip Mountain in the background.



Plate 4. View to the south from the Shawatum Creek Road.

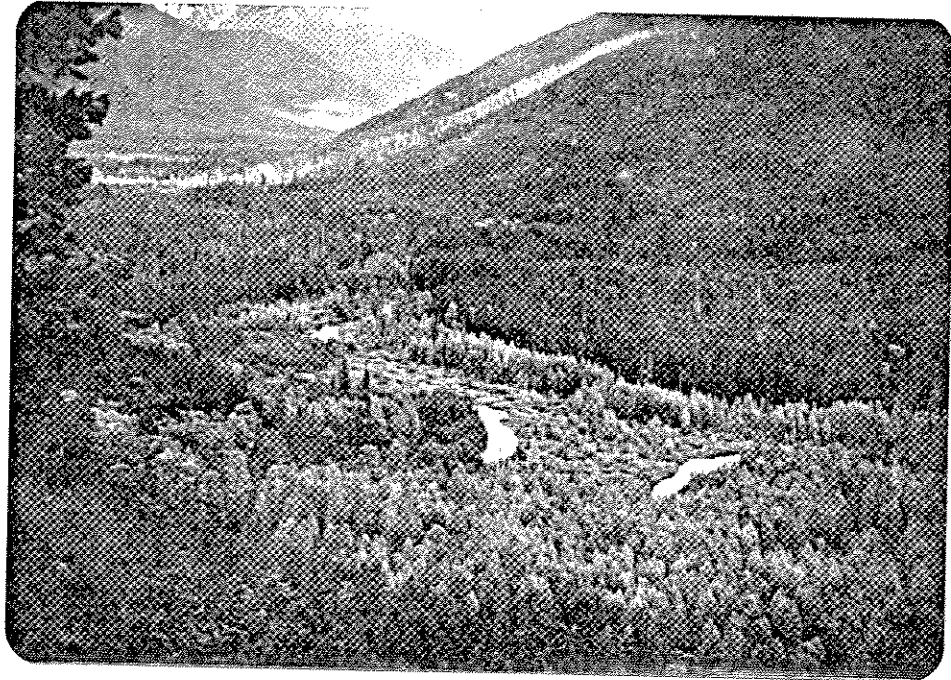


Plate 5. View of Klesilkwa River looking southeast towards the Skagit River.

They are generally fractured at right angles to the bedding planes, and are traversed by small veinlets of quartz. The argillites are generally dark coloured, and thin-bedded, and have often been so compressed as to become phyllites. The limestones at the south end of the district occur in narrow bands and are often crystalline, but to the north they are more massive and frequently show thicknesses of several hundred feet. The volcanic rocks are flows and breccias of a dark green colour and an andesitic composition.....The strata dip at high angles and have been folded into a series of anticlines and synclines striking and plunging towards the south. They are all much fractured and frequently faulted, and the thin-bedded rocks show those folding and contortion."















Camsell then describes the granodiorite, granophyre and other intrusives. Plutonic igneous rocks are only represented in the area by grandiorite which occurs in two separate bodies. The southern body is dyke-like in shape, and extends from the mouth of Galene Creek northwestward towards the upper waters of the Klesilkwa River. The northern body is exposed on the north side of the Sumallo river and in the angle between that stream and the Skagit. The grandiorite is a light-coloured, medium-grained rock, containing orthoclase, plagioclase, quartz, biotite and some hornblends, with accessory magnetite and titanite. Both bodies of this rock are intrusive into the Hozameen Series.

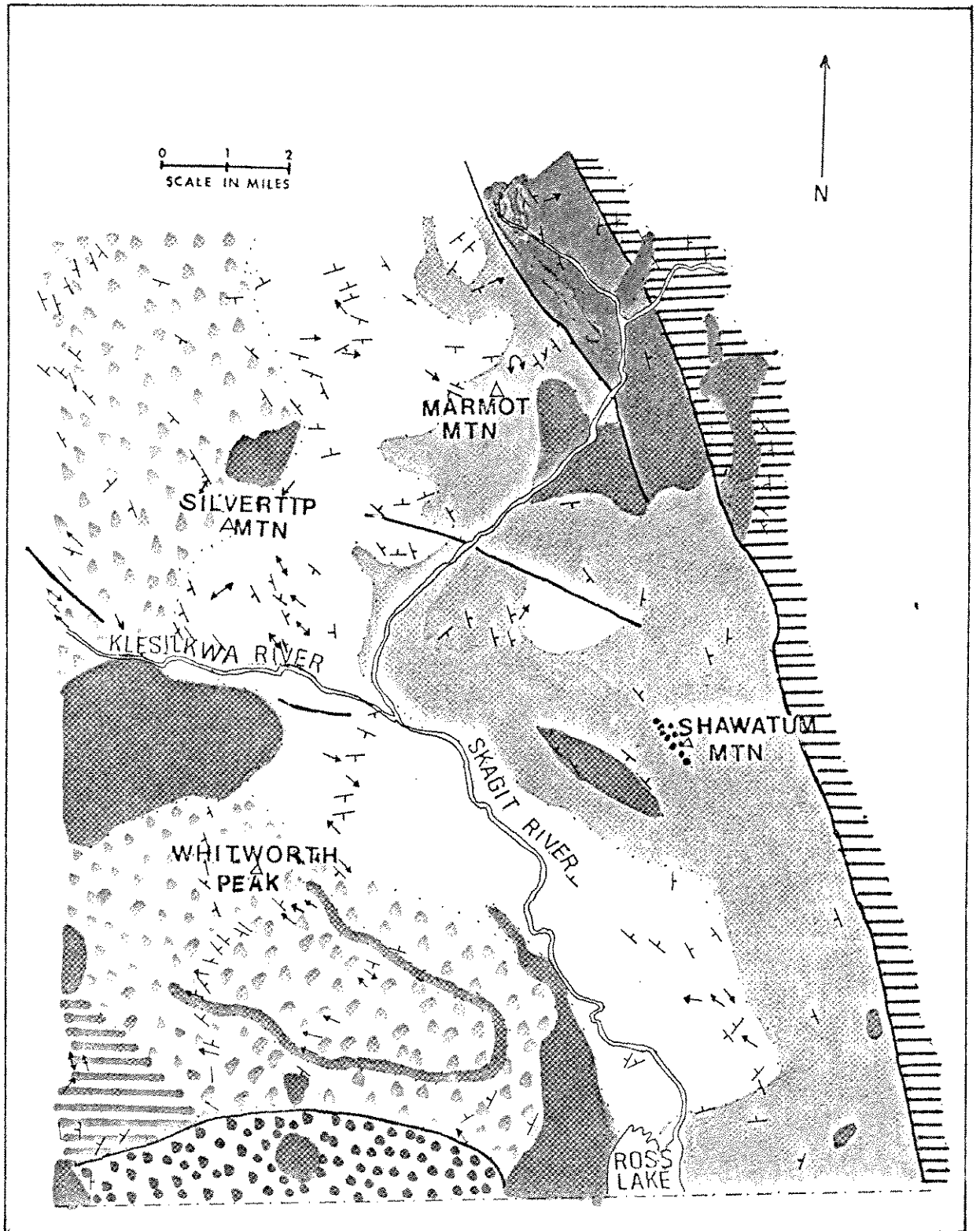
The dyke rocks of the district include lamprophyre, diabase, granophyre, syenite and diorite porphyries. ....The diorite porphyries... are all much altered and decomposed, but are seen in the thin section to consist plagioclase, feldspar, chlorite and calcite. Granophyre occurs as a large sill about 500 feet thick, intrusive into the Pasayten formation at the head of Twentyfourmile creek. It is a fresh light-coloured rock of medium grain, containing quartz, feldspar, biotite, and chlorite and titanite, with much secondary calcite.

Figure 2.

Bedrock Geology of the Skagit Valley Recreation Area  
(after McTaggart and Thompson, 1967)

KEY:

OLIGOCENE		Skagit volcanics
JURASSIC AND LOWER CRETACEOUS		Ladner and Dewdney Creek Groups
PRE-JURASSIC		Custer gneiss
LATE PALEOZOIC HOZAMEEN GROUP		
		Greenstone, chert, limestone
		Chert and argillite
		Greenstone
		Chert, limestone, greenstone
INTRUSIONS		
MIOCENE		Chilliwack batholith - tonalite
POST-EOCENE		Ultramafic rocks
CRETACEOUS		Tonalite
		Limestone, marble
		Bedding
		Lineation or fold axis
		Fault



### C. SURFICIAL GEOLOGY

Figure 3 shows the surficial geology of part of the Skagit Valley Recreation Area. Many of the surface deposits were laid down during the Quaternary age when the great glaciers were receding (Cairnes, 1923). At this time the large alluvial fans of Nepopekum and St. Alice Creeks were probably formed from the materials carried from the glaciers which they drained. All the tributary streams of the Skagit have formed prominent alluvial fans, but the smaller tributaries have produced steep-sided fans consisting mainly of coarse angular gravel and cobbles, whereas those of the larger Nepopekum and St. Alice creeks consist of coarse and occasionally cemented gravel and cobbles, the fan of the former creek, also showing some sandy silt deposits at least 6 feet thick (Thurber Consultants Ltd., 1970). The surface of the Nepopekum fan shows evidence of the creek having changed course several times.

During the retreat of the Skagit Valley glacier, an accumulation of poorly assorted debris was probably left behind which was then subsequently reassorted by the action of the streams occupying the valley. Cairnes (1923) points out that temporary damming of these streams, such as might occur through the accumulation of debris at the mouths of tributary valleys, or through rapid elevation or tilting of the valley floors, would result in the formation of gravel outwash terraces at various elevations above the present stream beds. These terraces are remnants of bench lands which range up to elevations of 1000' above the valley floor. These benches fringe the valley walls of the Skagit and Klesilkwa Rivers. A series of three such benches occur on the route from the valley floor of the Skagit near the International Boundary up to the Ponderosa Pine Ecological Reserve. Cairnes (1923) suggests that the elevation up to the highest bench (1000') represents the minimum thickness of glacial materials originally occupying the Skagit and Klesilkwa Valleys. The benches consist mainly of gravel, cobbles and boulders and contain a few prominent depressions (Kettle holes) which developed with the melting of large isolated blocks of glacial ice which were buried or partially buried in the gravels. The kettle holes today generally appear as small lakes or ponds on the benches (see Figure 3). Large glacial erratics may also be encountered on the










benches. The Centennial trail leading from the Twentysixmile bridge to the Hope-Princeton Highway passes by some immense glacial erratics.

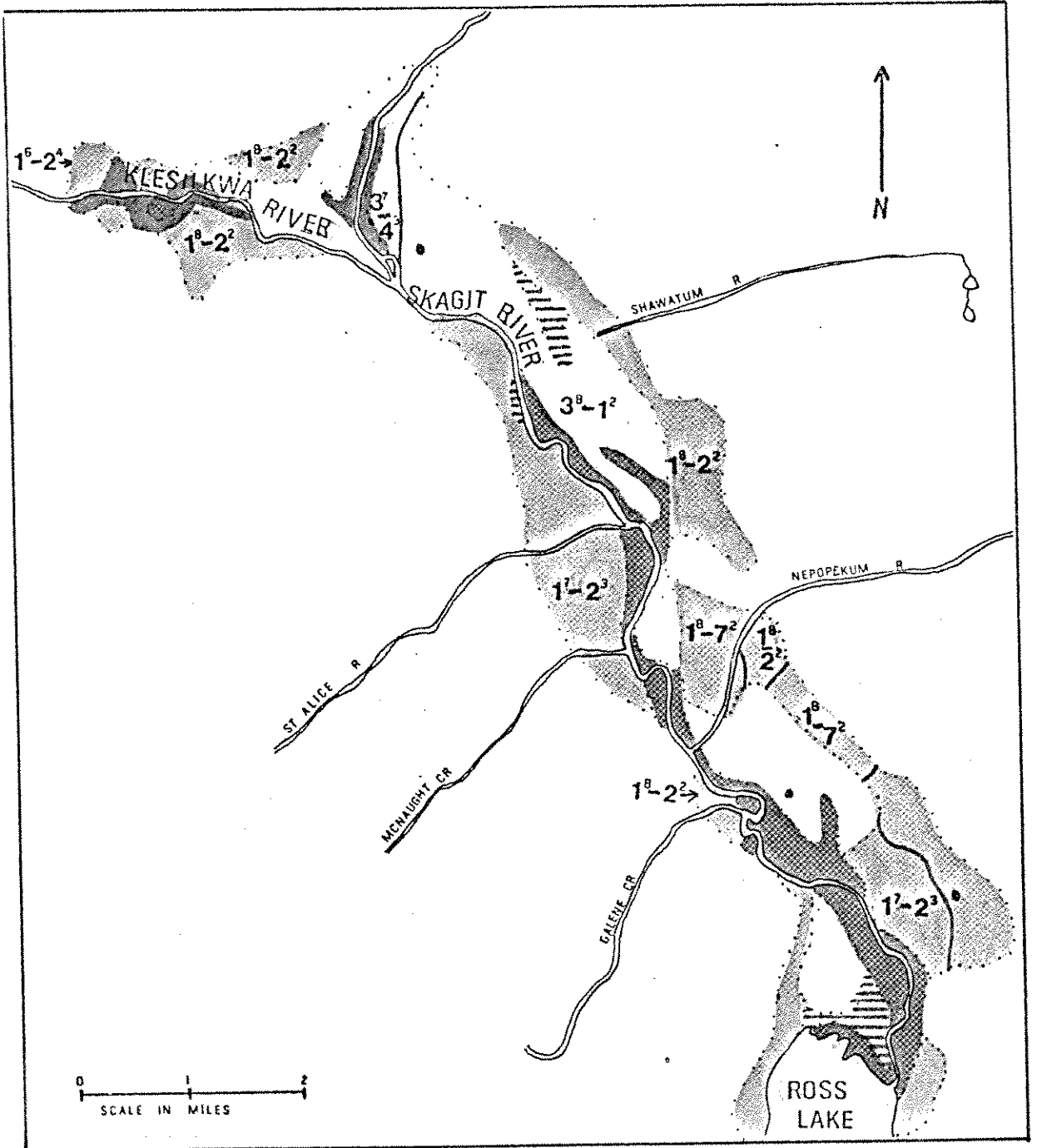
As is common in a steep-sided valley, talus deposits form at the point of contact between the exposed bedrock and the valley bottom deposits. These deposits are scattered throughout the lower part of the Skagit Valley and along the Klesilkwa but are very common along the upper portion of the Skagit Valley between the Twentysixmile bridge and the Hope-Princeton Highway. The rocks forming these deposits are generally larger and angular.

The alluvial river deposits form from the reworking of the outwash gravels and some of the alluvial fan material by the present river. These are the most recent deposits and form many of the river gravel beds as well as the present flood plain. In certain areas fine silt has been deposited, especially in abandoned river channels. Thurber Consultants Ltd. (1970) report that at the mouth of the Klesilkwa River, the alluvial fans have partially dammed the valley producing the extensive valley bottom swamps immediately upstream. The Skagit Valley Study Group (1971) note that the reworked outwash deposits of the Skagit River floodplain may be overlain by a layer of silt or sand loam which varies in thickness from two inches in the northern part of the valley to about two feet at the International Boundary.

Figure 3 Surficial geology showing the landform-soil units of the Skagit Valley (from the Canada Land Inventory). In areas where more than one soil unit occurs, the superscript refers to the proportion of each unit present (i.e. 1<sup>8</sup> - 2<sup>2</sup> represents 80% of soil unit 1 and 20% of soil unit 2).

Key:

- 1  Alluvial-colluvial fan deposits (well to moderately well drained)
- 2  Alluvial-colluvial fan deposits with seepage (imperfectly to moderately well drained).
- 3  Outwash terrace deposits (rapidly drained).
- 4  Outwash terrace deposits with loamy capping (well drained).
- 5  Floodplain deposits (imperfectly to poorly drained).
- 6  Organic deposits (very poorly drained).
- 7  Stony colluvium over bedrock (rapidly to well drained).
- Kettle holes.



#### D. GLACIATION

During the Pleistocene glaciation, the Skagit and Hozomeen Ranges were not covered by continuous ice caps. Daly (1912) contends that because the pre-glacial canyons were deep and had steep valley gradients, the local glaciers, by rapidly deepening the canyon, were capable of draining the snow fields rapidly and so lowering the average level of the ice. Thus the outflow of ice toward the sea or toward the unglaciated tracts was relatively fast in the western ranges. Of the effluent channels in the Cascades, the Skagit valley was the master for the Hozomeen Range and for the eastern slope of the Skagit Range. At the maximum glaciation the master glaciers had depths from 4000' to 5000'. The summits of the hills below 6,500' show obvious signs of having been scoured off by glaciers, whereas the higher peaks were sculptured by the prolonged action of local glaciers into knife edges, ridges and sharp horns. The descendants of these glaciers are represented in the Recreation Area by small glaciers occupying the northerly slopes of Silvertip Mountain and the American mountain visible at the head of McNaught Creek. As the climatic conditions became more moderate the master glaciers receded into the valleys, but the erosive work of cirque formation and of sharpening the ridges by head-wall recession continued long after the maximum glaciation was passed by means of local glaciers.

## E. THE FLORA

Whitford and Craig (1918) first recognized the transitional nature of the vegetation in the Skagit Valley between the dry Interior Forest Zone and the wetter Coastal Forest Zone. They placed the major portion of the Skagit Valley within the latter Forest Zone. Evidence for the ecotonal (transitional) nature of the Skagit Valley is based on range limitations of various tree species in or near the Recreation Area; for example, the eastern limit of broadleaf maple (Acer macrophyllum) (Plate 6), Sitka spruce (Picea sitchensis), amabilis fir (Abies amabilis), yellow cedar (Chamaecyparis nootkatensis) (except for small isolated population in the Selkirk Mountains); and the western limit of Engelmann spruce (Picea engelmannii) and Ponderosa pine (Pinus ponderosa) (Plate 7) at this latitude. This area is also the eastern limit for coastal populations of grand fir (Abies grandis), western hemlock (Tsuga heterophylla) and western white pine (Pinus monticola).

More recently, Krajina (1965, 1969) has mapped the Skagit Valley as an eastern extremity of the Coastal Douglas fir (Pseudotsuga menziesii) Zone, separated from the main zone by elements of the Western Hemlock, Mountain Hemlock (Tsuga mertensiana) and Alpine Tundra Zones. Salal (Gaultheria shallon) and sword fern, normally abundant in the Coastal Douglas-fir Zone, are sporadic in occurrence in the Valley. One factor which may account for the differences in relative abundance of the plant species associated with the Coast Douglas-fir Zone in the Skagit Valley is the difference in elevation, the Valley floor being 1000 feet greater than the major portion of the Coastal Douglas-fir Zone on the Mainland and about 100 feet greater than the maximum elevation listed for this Zone on Vancouver Island.

The I.J.C. Report (1971) suggests that the lower Skagit and the Klesilkwa River are similar to the Coastal Douglas-fir Zone which is characterized by annual precipitation from 30 to 60 inches and by the occurrence of Douglas-fir, western red cedar (Thuja plicata), grand fir, Sitka spruce, white pine, lodgepole pine (Pinus contorta), bitter cherry (Prunus emarginata), black cottonwood (Populus trichocarpa), red alder (Alnus rubra), vine maple (Acer circinatum), and broadleaf maple (Krajina, 1969). Climax stands of Western hemlock occur in areas of temporary seepage, but on mesic sites Douglas-fir is the climax species.



Plate 6. Broadleaf maple is rare in this valley, the eastern extremity of this tree's range.

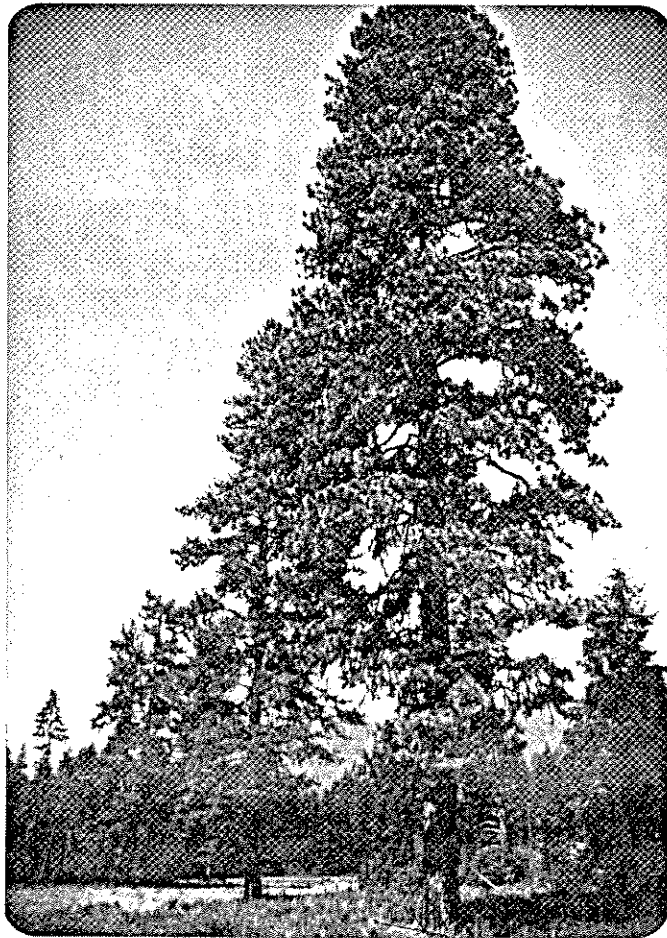


Plate 7. The ponderosa pines in the Ponderosa Meadow

The Coastal Douglas-fir Zone in the Skagit Valley typically occurs on the valley floor, and intergrades with the Western Hemlock Zone between 2,000 and 3,000 feet and with the Mountain Hemlock Zone between 4,000 and 5,000 feet, depending upon exposure and local climate.

Slaney (1973) argues that since moisture gradients are largely responsible for the occurrence of any particular vegetation zone in the Valley, regions which are in rain shadow tend to support the dry Interior Forest Zone. Whereas, the International Joint Commission Report considers the plants of the Dry Interior Zone to be either relics from a formerly different climatic type which occurred in the Valley but has since changed thus forcing the dry interior plants to evolve so that they may survive in a habitat that is otherwise too wet for the main populations of these species; or the dry interior plants are actual marginal populations that survive only in habitats where competition from species more adapted to the climate is lessened (i.e. on dry rocky outcroppings and in rain shadows).

The International Joint Commission Report (1971) further points out that the uniqueness of the Skagit Valley is determined by its low elevation within the Coastal-Interior transition zone.

"This allows a mixing of low-elevation plants from the Pacific Coast Forest. This type of transition is relatively uncommon for two reasons. Firstly, the usual transition between Coastal and Interior Zones occurs at Subalpine and Alpine elevations, thus keeping the low-elevation plants from the Interior and Coast spacially separated. Secondly, this type of transition is normally restricted to the Cascade or eastern Coastal Mountain Ranges in British Columbia, and, because of the limited northward extent of the Ponderosa Pine Zone, to the southern fifth of the Province.....plant growth closely reflects the transitional nature of the macroclimate.
















#### PLANT ASSOCIATIONS

There are several distinct plant communities which occur in the Skagit Valley, the composition of which is determined by the moisture gradient in the soil and the composition of the soil itself. The International Joint Commission Report (1971) uses the five landform-soil units of the lower Skagit Valley to characterize the plant communities, since the woodland habitats generally coincide with the landform units, although more than one habitat may occur on some units.

The Slaney Report (1973) on the vegetation of the Skagit Valley determined the major plant associations on the basis of the successional stage and of the combination of ecologically related species.

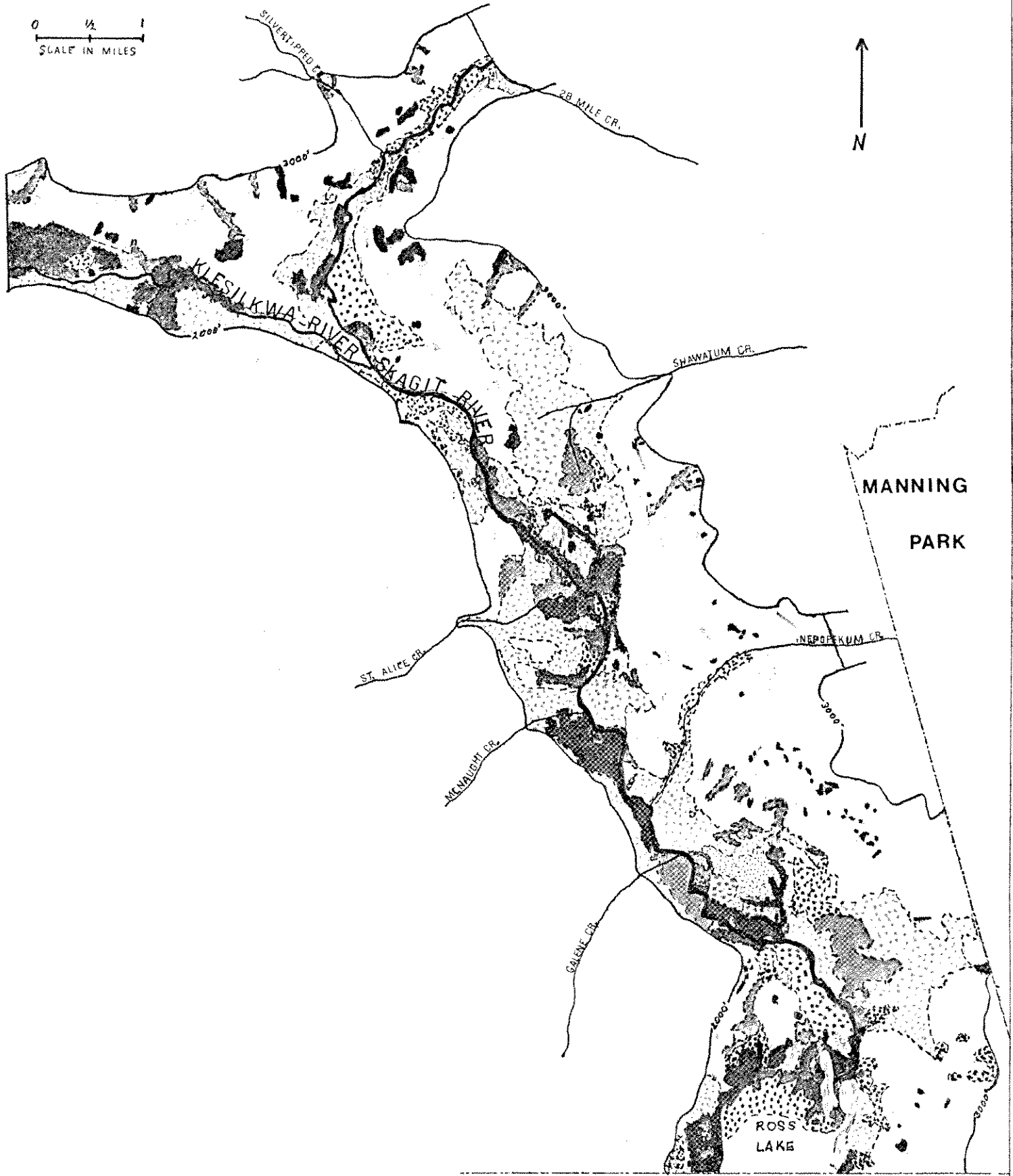
Figure 4 - Vegetation Associations And Habitats  
(After Slaney, 1973).

KEY:

-  Deciduous more than 40' tall.
-  Deciduous regeneration less than 40' tall.
-  Mixed deciduous and coniferous advanced succession.
-  Mixed deciduous and coniferous regeneration with a canopy layer developed.
-  Mixed deciduous and coniferous regeneration with no canopy layer developed.
-  Mixed coniferous forest on mesic to wet sites.
-  Pure or mixed Douglas fir and lodgepole pine on drier sites.
-  Coniferous regeneration.
-  Rock outcrops.
-  Meadow
-  Marsh
-  River riparian.
-  Shrubs
-  Logged areas since 1969
-  Drawdown



0 1/2 1  
SCALE IN MILES



MANNING  
PARK

ROSS  
LAKE

The present report will follow the method of Slaney (1973) in using the various forest associations to show the succession stage reached after disturbance by either fire or logging. The various plant habitats are shown in Figure 4, the alpine meadow classification is not represented nor are the hemlock, mountain hemlock or the amabilis fir zones. Many of these plant associations and habitats will be discussed in greater detail with respect to their interpretative value in a later section.

A list of the flora of the Skagit Valley Recreation Area is presented in Appendix 1.

1. Deciduous Forest (more than 40' tall)

Black cottonwoods 40-50 years old provide a canopy which allows some light to reach the heavily leaf-littered forest floor. Some small cedar, grand fir and Douglas fir also grow here. At one time many of these cottonwood stands contained many large cedars which have since succumbed to shake cutters. Both large stumps and shake workings are usually evident. The shrub layer mainly consists of thimbleberry and red osier dogwood with some willow (Salix scouleri) and snowberry. There is generally little ground vegetation because of the heavy accumulation of deciduous leaf litter. The usual ground cover species include bedstraw, Pyrola (several species), horsetail (by the riverbank), baneberry, star flower, false box, lady fern, moss, and pearly everlasting (along old roads or the forest edge.)

2. Deciduous Regeneration (less than 40' tall)

The first major tree regeneration after logging operations involves mostly red alder and black cottonwood, the former predominating initially. The shrub understory forms an almost impenetrable growth of vine maple, red osier dogwood, willow and rose with lesser amounts of snowberry, thimbleberry, red elderberry and small cedar saplings. Twin flower occurs under the alder stands, while cascara may grow in areas shaded either by alder or shrubs such as vine maple. The few ground cover species that are present include lady fern (Athyrium filix-femina), northern bedstraw, bluejoint grass (Calamagrostis canadensis) and moss.

3. Mixed Deciduous and Coniferous Forest (advanced succession)

The dominant trees are cottonwood and red cedar with the understory tree being mostly cedar and some smaller cascara. The large trees reach a height of about 150 feet, the average age of the cottonwoods being roughly estimated at 100 years old. Most of these stands have been

selectively logged for cedar. More recently, the Scott Paper Company has applied to the Forestry Branch for permission to cut 450 cottonwood trees in Timber Sale No. A00696 C.P. 3 Blk. A, which is located about 100 yards west of Chittenden's Bridge and extends north to the Skagit River. If the sale is permitted, the occurrence of the mixed deciduous and coniferous advanced succession biotic zone in the Skagit Valley would be reduced by 25 percent.

The predominant plants of the forb layer in this zone include lady fern, foam flower, stinging nettle, bleeding heart, trillium, wild ginger, starflower, starflowered Solomon's seal, Pacific mitrewort (Mitella trifida) and moss.

4. Mixed Deciduous and Coniferous Regeneration (canopy layer developed)

Cottonwood, western white birch, red cedar, western hemlock, bitter cherry and sitka alder form a semi-open canopy about 40 feet above the ground. The shrub layer is very dense and consists mostly of thimbleberry, vine maple, red-osier dogwood and willow with some black twinberry, red currant and swamp gooseberry. The relatively sparse ground cover includes fragrant bedstraw, horsetail, bleeding heart, twinflower, false box, Oregon grape, queen's cup, twisted stalk, lady fern and, in more open areas, cow parsnip and alumroot. These regions were logged in the early 1950's for the large Douglas fir and red cedar which were the climax species.

5. Mixed Deciduous and Coniferous Regeneration (no canopy layer developed)

The trees and shrubs are mixed in a single layer where a dense cover is formed by cottonwood, Douglas fir, red cedar, grand fir, Scouler willow, vine maple, red currant, thimbleberry, Saskatoon berry, red-osier dogwood, black twinberry, rose and snowberry. In wet areas Pacific crabapple and hawthorn are abundant. In open dry areas bracken is predominant. The ground cover is comprised of Oregon grape, star flower, bunchberry, false box and moss. Logging operations had removed the Douglas fir cover which once dominated these areas.

6. Mixed Coniferous Forest (on mesic to wet sites) (Plate 8, 9, & 10)

Here the Douglas fir is the dominant tree species forming a canopy layer 120 feet above the ground. Sixty feet below this canopy is an open understory of grand fir, red cedar and western hemlock. Saplings of red cedar, western hemlock, grand fir, white pine and Douglas fir

form medium density stands which suppress the deciduous shrubs. Some shrubs such as red huckleberry, vine maple and rose occur at low density. Oregon grape and moss account for over 50% of the ground cover, the rest is made up of starflower, bunchberry, black mountain huckleberry, twinflower, queen's cup, Prince's pine and false box.

#### 7. Pure or Mixed Douglas Fir and Lodgepole Pine Forests (on drier sites)

Fortunately, the Douglas fir and lodgepole pine forests located on the drier sites were left by the loggers because these stands were considered to be 'of poor quality.' The Douglas firs average about 100' tall and form a semi-open canopy. The understory consists mostly of younger Douglas fir and some grand fir. The shrub layer is sparse and contains vine maple, soopolallie, red huckleberry, Saskatoon, hazelnut and rose. A mossy ground cover predominates with a high frequency of Oregon grape and false box and lesser amounts of Prince's pine, bunchberry, flat top spirea, twinflower, star flower, strawberry, black mountain huckleberry and kinnikinnick. The lodgepole pines, in pure stand, average about 40' in height and also form a semi-open canopy. There is no obvious understory of regenerating trees. The shrub layer is also sparse and consists of redstem ceanothus, bitter cherry, rose, saskatoon and soopolallie. The ground cover is dominated by false box, kinnikinnick and lupine with smaller amounts of flat top spirea, Oregon grape, blue huckleberry, Prince's pine, moss, lichens, bunchberry, strawberry and twinflower.

#### 8. Coniferous Regeneration

Dense thickets of Douglas Fir (averaging about 20' high) are intermixed with red cedar, grand fir, vine maple, Saskatoon, Scouler willow, red huckleberry and red currant. Ground cover is predominantly moss with lesser amounts of false box, twinflower and kinnikinick followed by a smaller frequency of Oregon grape, Prince's pine, queen's cup, star flower and black mountain huckleberry. This type of regeneration after logging is associated with mesic and dry sites.

#### 9. Rock Outcrops and Active Slides

Rock outcrops on the valley sides are very dry with ground cover consisting mostly of thick layers of mosses and lichens. The plant communities in these areas are from the Interior Douglas-fir Zone.

The rocky outcrop in the Ponderosa Pine Ecological Reserve (Plate 11) is a typical example of such a habitat. Besides moss and lichens, the ground cover consists of steer's head (Dicentra uniflora), Hooker's onion (Allium acuminatum), small flower alumroot (Heuchera micrantha), rosy pussytoes (Antennaria rosea) and Lematium ambigium with the shrubs, rocky mountain juniper (Juniperus scopulorum) and flat-top spirea and the grasses, bluebunch wheatgrass (Agropyron spicatum) and pinegrass (Calamagrostis rubescens).

The active slides support crusty lichens and patches of moss and some forbs such as the spotted saxifrage. These slide areas are most prevalent along the upper Skagit Valley from above the 26-mile bridge to the Hope-Princeton Highway.

#### 10. Meadows (valley bottom)

Several meadows occupy dry sites in the valley bottom. Most of the meadows had been used for grazing cattle in the early 1900's. One of the floristically more interesting meadows occurs just north of the Ross Reservoir and is referred to as the Ponderosa Pine meadow (Plate 7). This 23 acre meadow, as the name implies, contains some large Ponderosa pine trees. There is also a beautiful trembling aspen (Populus tremuloides) grove along the edge of the meadow. Some of the other plants which occur here include wild rose (Rosa nutkana) (Plate 12), yarrow (Achillea millefolium), pink pussytoes, western columbine (Aquilegia formosa), tower mustard (Arabis glabra), purple pea (Lathyrus nevadensis), field chickweed (Cerastium arvense), river cinquefoil (Potentilla rivalis), timothy (Phleum pratense), Kentucky bluegrass (Poa pratensis) and pinegrass. A fuller account of this meadow is presented in the Interpretation Zone section. Another meadow of 13 acres, commonly called the Whitworth meadow, is located 2.7 miles north of the International Boundary and it too shall be discussed later.

#### 11. Meadows (alpine)

Most of the alpine meadows visible from the Valley floor are located on the east side in Manning Park.

The alpine meadows in the Recreation Area are found on the west side of Shawatum Mountain, on the south side of Silvertip Mountain, on Whitworth Peak and on the high ridges to the south of Whitworth Peak.

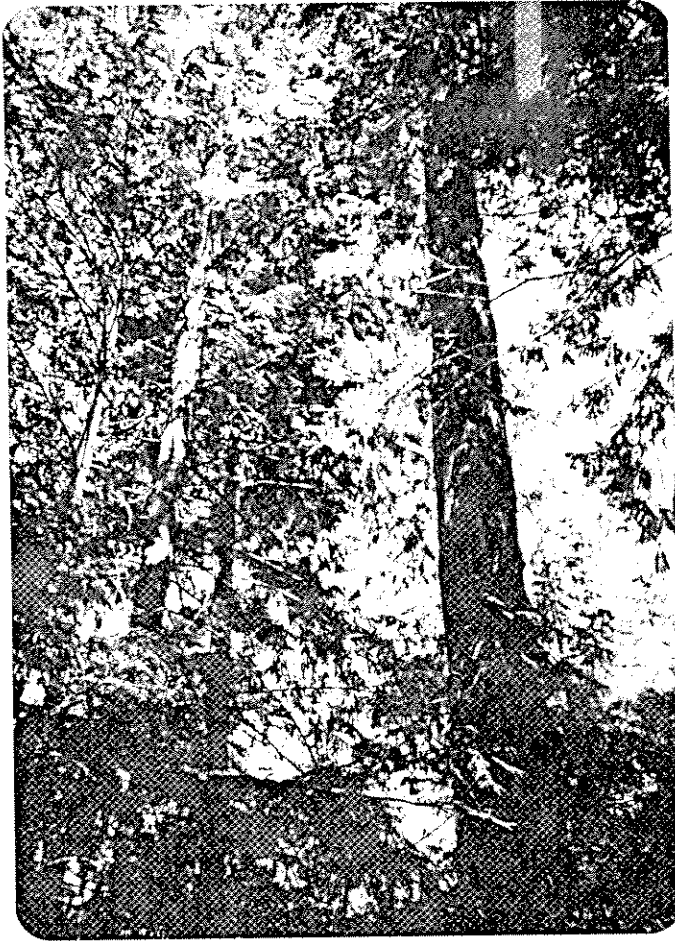


Plate 8. Large cedar and Douglas fir may be found on the benches below the Ponderosa Pine Ecological Reserve.

Plate 9. Douglas fir forest on mesic site along Centennial (Whitworth) Trail.

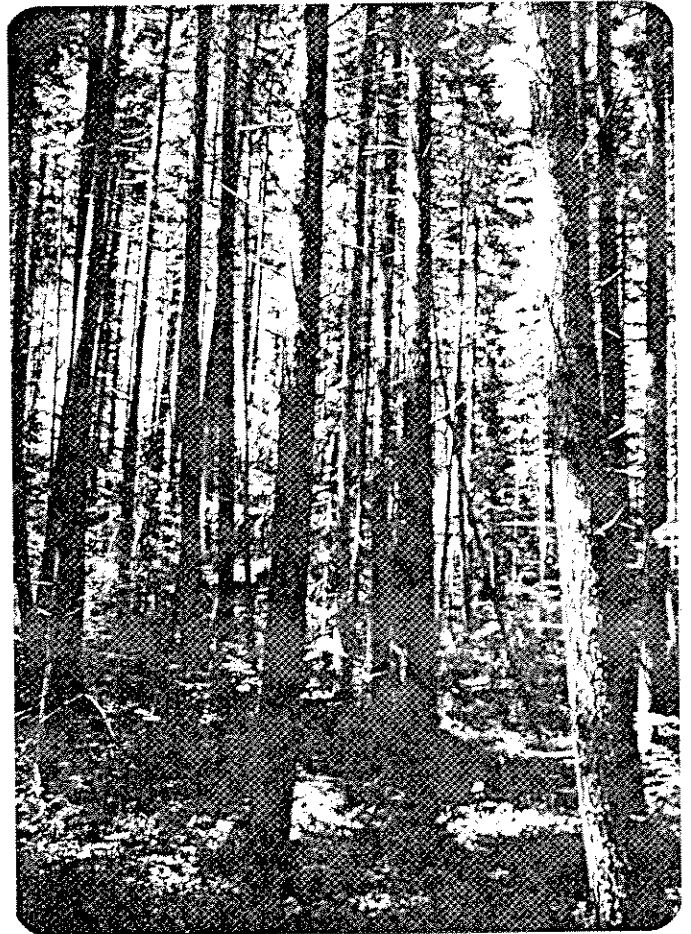
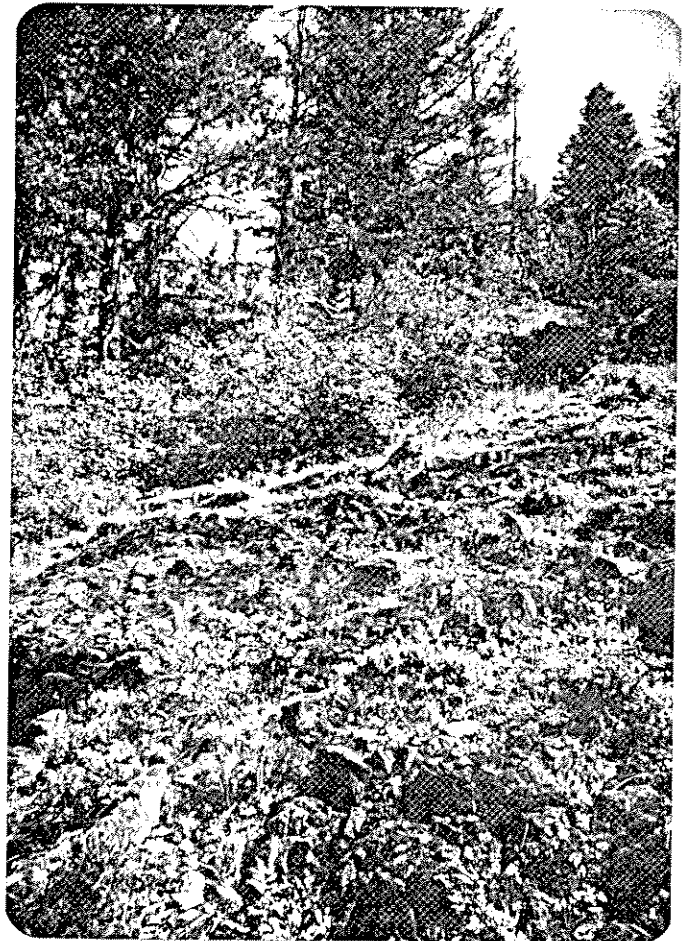




Plate 10. Large cedar  
and Douglas fir may be  
found in the wetter  
areas along the Centennial  
(Whitworth) Trail.

Plate 11. The unique  
flora of the Ponderosa  
Pine Ecological Reserve.



Most of these meadows are sub-alpine and, therefore, are dependent on fire for their existence. Only one high meadow area was visited, this being just north of the Border on the west side of the Valley at the head of Galene Creek. (Plate 13). The dominant trees were typically the alpine fir, mountain ash, white bark pine and spruce. The shrubs consisted mostly of white rhododendron, red heather, white heather and red flowering currant. Other ground cover included mountain valerian (Valeriana sitchensis), Western anemone (Anemone occidentalis), several species of penstamon, grouseberry (Vaccinium scoparium), spreading phlox, Indian hellebore (Veratrum veride), Indian paintbrush (Castilleja sp.), mountain lupine (Lupinus latifolia), and meadow rue (Thalictrum occidentale.)

#### 12. Ponds and Swamps (Plates 14, 15 & 16)

The small marshes are in various stages of pond succession from being completely covered with sedges to having open water sufficient to support resident beavers. The plants characteristic to the edge of such wet open areas include skunk cabbage, stinging nettle (Urtica dioica), Pacific willow (Salix lasiandra), swamp gooseberry (Ribes lacustre), hard hack (Spirea douglasii), and red-osier dogwood. Various rushes and sedges are found advancing into the water, especially bulrush (Scirpus microcarpus), Carex rostrata and Juncus ensifolius. The floating plant community may consist of yellow water lily (Nuphar polysepalum), and water smartweed (Polygonum amphibium). The flora of certain marshes especially important for interpretation will be discussed in more detail in a later section.

#### 13. River Riparian (Plate 17)

This vegetation type is restricted to regions along the riverbank that are subject to periodic flooding. The shrub layer is formed from a dense growth of cottonwood and willow saplings, red-osier dogwood, vine maple and thimbleberry. The ground vegetation is limited to queen's cup, bleeding heart and bedstraw because of the heavy leaf litter and intense cover.

#### 14. River Bank Regeneration

After the protective cover of cedar and cottonwood were removed by logging, a very vigorous pioneer community developed making travel along the riverbanks extremely difficult. The plants along the river bank include vine maple, red-osier dogwood, black twinberry, waxberry, horsetail (Equisetum sp.), devil's club, gooseberry (Ribes sp.)





Plate 12. Wild roses (Rosa nutkana) are very abundant in the Ponderosa Meadow.



Plate 13. The lakes and alpine country at the head of Galene Creek (end of July).

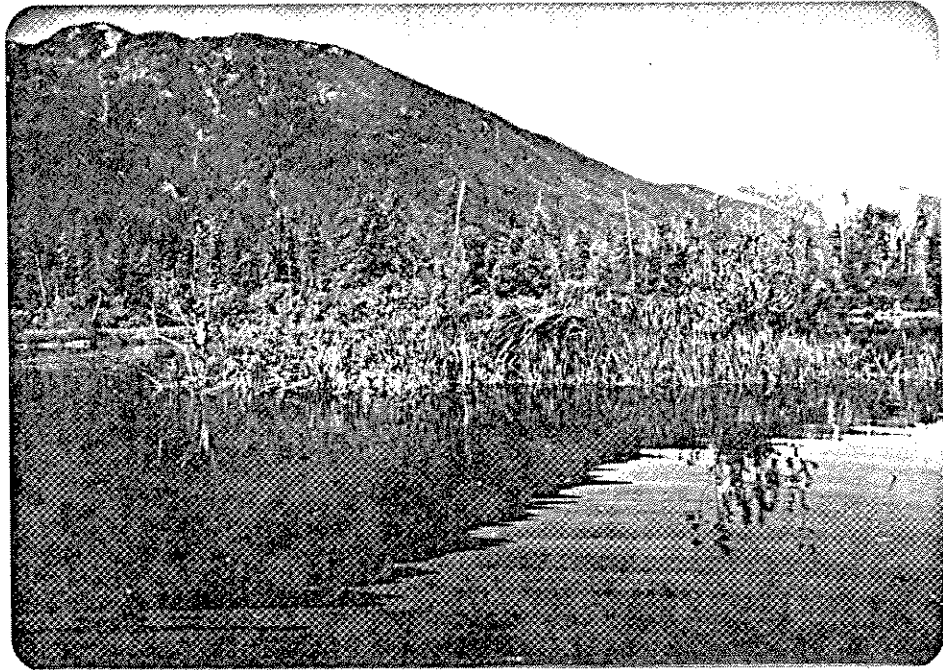


Plate 14. The marsh near the Whitworth Meadow is a good place to see a wide variety of birds and many deer, especially does with fawns.

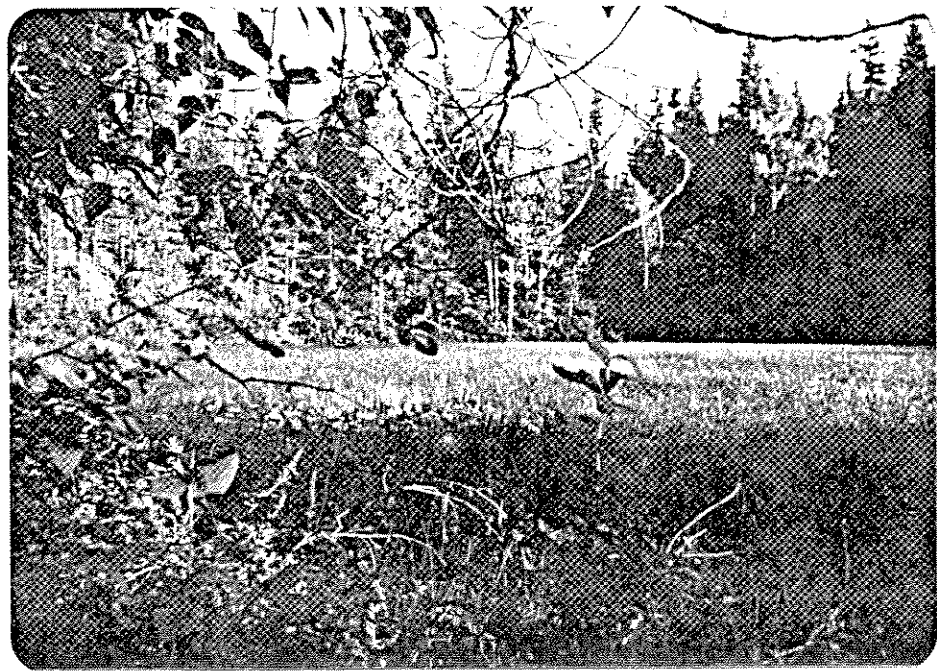


Plate 15. Sedge covered kettle hole beside the Centennial Trail.

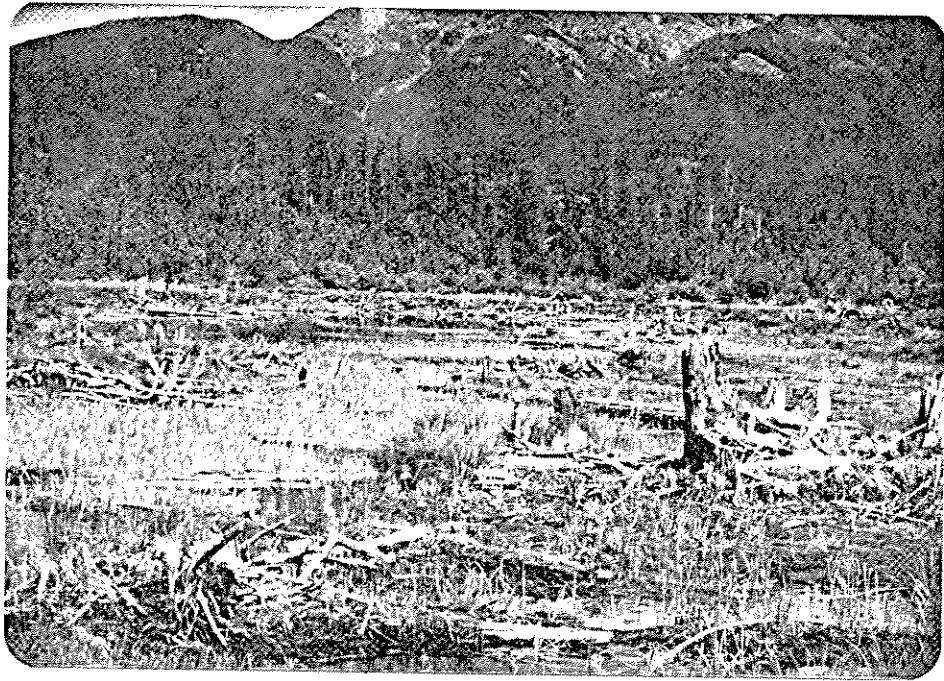


Plate 16. Marsh, south-west of the Ponderosa Meadow before flooding.



Plate 17. Cottonwood habitat by the Skagit River.

hazelnut, Saskatoon berry, thimbleberry, red alder, mountain alder (A. tenuifolia), cottonwood, willow, wild rose, thistle (Cirsium sp.), stinging nettle, burdock (Arcitium sp.) and field chickweed.

15. Shrub

This habitat occurs on avalanche chutes and steep stream channels. Only a shrub layer is usually observed and this consists mainly of vine maple, willow, mountain alder and devil's club (the latter near streambeds only).

16. Recent Logging Slash

Any area that has been strip logged within the past five years is included in this category. The pioneer species found here include fireweed, red and white clover, dandelions, thimbleberry, thistle, burdock, field chickweed, strawberry, various grasses and red elderberry.

17. Drawdown Area (Plates 18, 19, 20, & 21)

The upper portion of the drawdown area of Ross Lake supports both aquatic and terrestrial plant communities. The terrestrial plants which include water foxtail grass, Kentucky bluegrass, curled dock, field chickweed and chamomile are evident during April, May and June and survive the flooding during July, August and part of September. The aquatic species start growing in July after inundation.



Plate 18. The drawdown area near the International Border, as seen from the Ponderosa Pine Ecological Reserve.



Plate 19. Tall grass dominates the vegetation of the drawdown area.

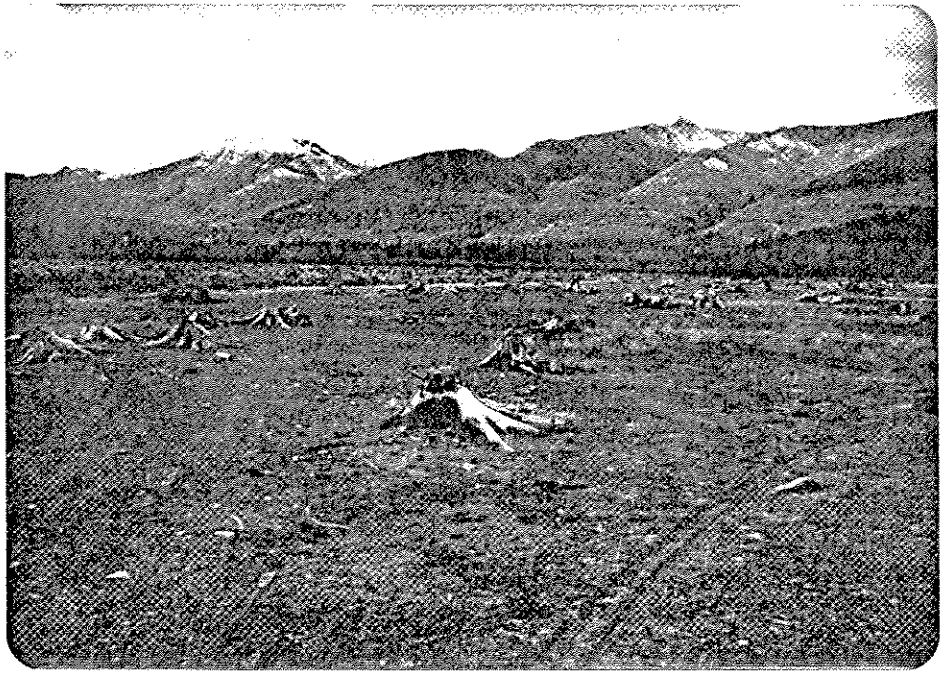


Plate 20. The drawdown area looking north-east, Shawatum Mountain still covered with snow (June) in the background.



Plate 21. Rorippa curvisiliqua is an annual land plant that is able to complete its life-cycle in the drawdown area before flooding.



Plate 22. Indian paintbrush on the Ponderosa Pine Ecological Reserve.



Plate 23. Rhododendrons are locally abundant throughout the Valley.



Plate 24. Blue violets are common in the shady areas in the Spring.



REFERENCES

- Adams, T.B. et al. 1971. The future of the Skagit Valley. Report to the International Joint Commission.
- British Columbia Wildlife Federation (undated) Environmental concerns for the Skagit River Valley. Report to the Dept. of Environment.
- Cairnes, C.E. 1923. Reconnaissance of Silver Creek, Skagit and Similkameen Rivers. Summary Report A.Geol. Surv. of Canada.
- Camsell, Charles. 1911. Geology of the Skagit Valley, Yale District, B.C. Part III. Summary Report V Geol. Surv. of Canada
- Hitchcock, Leo C. and Arthur Conquist 1973. Flora of the Pacific Northwest, an illustrated manual. Univ. of Wash. Press.
- Holland, Stuart S. 1964. Landforms of British Columbia, a physiographic outline. B.C. Dept. of Mines. Bull. 48.
- International Joint Commission 1971. Environmental and ecological consequences of raising Ross Lake in the Skagit Valley to elevation 1725.
- McTaggart, K.C. and R.M. Thompson. 1967. Geology of part of the northern Cascades in southern British Columbia. Canadian Journal of Earth Sciences. Vol. 4.
- Seattle City Light 1974. The aquatic environment, fishes and fishery. Ross Lake and the Canadian Skagit River. Interim Report. No. 3 Vol. 1.
- Slaney, F.F. and Co. 1973. Environmental investigations proposed High Ross Reservoir. Report 2. The soil survey. City of Seattle. Dep't. of Lighting.
- \_\_\_\_\_ 1973. Environmental investigations proposed. High Ross Reservoir. Report 3. The vegetation. City of Seattle. Dep't. of Lighting.
- \_\_\_\_\_ 1973. Environmental investigations proposed High Ross Reservoir. Vol. III. Wildlife-mammalian resources. City of Seattle. Dept. of Lighting.
- \_\_\_\_\_ 1973. Environmental investigations proposed High Ross Reservoir. Report II Recreation. City of Seattle, Dep't. of Lighting.
- Spriggs, W.M. 1973. A proposal for a recreation area in the Skagit River Valley. Parks Branch, Victoria, B.C.
- Thurber Consultants Ltd. 1970. Shoreline stability study of Ross Lake Reservoir (Canada). Report to F.F. Slaney and Co. Ltd.

## APPENDIX 1

Flora List of the Skagit Valley Recreation Area

## Lichens

Cladonia sp.  
Peltigera aphthosa (L.) Willd.  
P. canine  
Stereocaulon tomentosum

## Musci

## Moss

Aulacomnium androgynum  
Calliergon cordifolium  
Dicranum fuscescens Turn.  
Drepanocladus exannulatus  
Hylocomium splendens (Hedw.) B.S.G.  
Hypnum circinale  
Mnium glabrescens Kindb.  
M. insigne Mitt.  
M. spinulosum B.S.G.  
Plageothecium denticulatum (Hedw.) B.S.G.  
Pleurozium schreberi (Brid.) Mitt.  
Polytrichium juniperinum Hedw.  
Rhacomitrium canescens (Hedw.) Brid.  
Rhytidiadelphus triguetris (Hedw.) Warnst.  
Rhytidiopsis robusta (Hook.) Broth.

## Lycopodiaceae

## Clubmoss Family

Lycopodium annotinum L.                   stiff clubmoss  
L. clavatum                               ground pine  
L. complanatum                         ground cedar

## Equisetaceae

## Horsetail Family

Equisetum arvense L.                   common horsetail  
E. hyemale L.                           common scouring-rush  
E. telmateia Ehrh.                   giant horsetail

## Ophioglossaceae

## Adder's-tongue Family

Botrychium virginianum (L.) Swartz   grapefern

## Polypodiaceae

## Polypody Family

Adiantum pedatum L.                   northern maidenhair fern  
Athyrium filix-femina (L.) Roth.   lady-fern  
Cheilanthes gracillima               lace lip-fern  
C. siliquosa Maxan.                   Indian's dream  
Cryptogramma crispa (L.) R. Br.   parsley-fern  
C. densa  
Cystopteris fragilis (L.) Bernh.   brittle bladder-fern

<u>Dryopteris austriaca</u> (Sacq.) Woynar	spiny wood-fern
<u>Gymnocarpium dryopteris</u> (L.) Newm.	oak-fern
<u>Polypodium glycyrrhiza</u> D.C. Eat.	Licorice fern
<u>Polystichum lonchitis</u> (L.) Roth	mountain holly-fern
<u>P. munitum</u> (Karrlf.) Presl.	western sword-fern
<u>Pteridium aquilinum</u> (L.) Kuhn.	bracken
<u>Woodsia scopulina</u> D.C. Eat.	Rocky mountain woodsia
Taxaceae	Yew Family
<u>Taxus brevifolia</u>	western yew
Cupressaceae	Cypress Family
<u>Chamaecyparis nootkatensis</u> (D. Don)	yellow cedar
<u>Juniperus communis</u> L.	mountain juniper
<u>J. horizontalis</u> Moench.	creeping juniper
<u>J. scopulorum</u> Sarg.	Rocky mountain juniper
<u>Thuja plicata</u> Donn.	western red cedar
Pinaceae	Pine Family
<u>Abies amabilis</u> (Dougl.) Forbes	amabilis fir
<u>A. grandis</u> (Dougl.) Forbes	grand fir
<u>A. lasiocarpa</u> (Hook.) Nutt.	alpine fir
<u>Picea engelmannii</u> Parry	Engelmann spruce
<u>Pinus albicaulis</u> Engelm.	white bark pine
<u>P. contorta</u> Dougl. var. <u>latifolia</u> Engelm.	lodgepole pine
<u>P. monticola</u> Dougl.	western white pine
<u>P. ponderosa</u> Dougl.	ponderosa pine
<u>Pseudotsuga menziesii</u> (Mirbel) Franco	Douglas Fir
var. <u>menziesii</u>	
<u>Tsuga heterophylla</u> (Raf.) Sarg.	western hemlock
<u>Tsuga mertensiana</u> (Bong.) Carr	mountain hemlock
Salicaceae	Willow Family
<u>Populus tremuloides</u> Michx.	trembling aspen
<u>P. trichocarpa</u> Torr. & Gray	black cottonwood
<u>Salix lasiandra</u> Benth.	Pacific Willow
<u>S. scouleriana</u> Barratt	Scouler willow
Betulaceae	Birch Family
<u>Alnus rubra</u> Bong	red alder
<u>A. sinuata</u> (Regel) Rydb.	sitka alder
<u>A. incana</u> (L.) Moench	mountain alder
<u>Betula occidentalis</u> Hook.	water birch
<u>B. papyrifera</u> Marsh.	paper birch
<u>Corylus cornuta</u> Marsh	hazelnut
Urticaceae	Nettle Family
<u>Urtica dioica</u> L. var. <u>lyalli</u> (Wats.) Hitchc.	stinging nettle

## Aristolochiaceae Birthwort Family

Asarum caudatum Lindl. wild ginger

## Polygonaceae Buckwheat Family

Eriogonum heracleoides Nutt. wild buckwheat  
Polygonum coccineum Muhl. water smartweed  
Rumex acetosella L. sheep sorrel  
R. crispus curly dock  
R. paucifolius mountain sorrel

## Portulacaceae Purslane Family

Montia parviflora (Moc.) Greene small-leaved montia  
 var. parvifolia  
M. perfoliata (Donn) Howell miner's lettuce  
M. sibirica (L.) Howell Siberian miner's lettuce

## Caryophyllaceae Pink Family

Arenaria lateriflora L. bluntleaf sandwort  
A. macrophylla Hook. bigleaf sandwort  
Cerastium arvense L. field chickweed  
C. nutans Rof. nodding chickweed  
C. viscosum L. sticky chickweed  
C. vulgatum L. mouse-ear chickweed  
Dianthus armeria L. grass pink  
Silene Menziesii Hook. Menzies silene  
Spergularia rubra (L.) Presl. red sandspurry

## Nymphaeaceae Water-lily Family

Nuphar polysepalum Engelm. Yellow water lily

## Ranunculaceae Buttercup Family

Actea rubra (Ait.) Willd. baneberry  
Anemone lyalli Britt. Lyall's anemone  
Anemone occidentalis western anemone  
Aquilegia formosa Fisch. western columbine  
Delphinium nuttallianum Pritz. upland larkspur  
 var. lineapetalum (Ewan) Hitch.  
Ranunculus abortivus L. smallflowered buttercup  
R. acrifolius Gray sharp buttercup  
R. acris L. meadow buttercup  
R. alismaefolius Geyer water plantain buttercup  
R. aquatilis L. water crowfoot  
R. flabellaris Raf. yellow water-buttercup  
R. flammula L. creeping buttercup  
R. macounii Britt. var. macounii Macoun's buttercup  
R. occidentalis Nutt. var. occidentalis western buttercup  
R. repens L. creeping buttercup  
R. uncinatus D. Don. little buttercup  
Thalictrum occidentale Gray western meadowrue

## Berberidaceae           Barberry Family

<u>Achlys triphylla</u> (Smith) D.C.	vanilla leaf
<u>Berberis aquifolium</u> Pursh.	tall mahonia
<u>B. nervosa</u> Pursh.	Oregon grape
<u>B. repens</u> Lindl.	creeping mahonia

## Fumariaceae           Fumitory Family

<u>Dicentra uniflora</u>	steer's head
<u>D. formosa</u> (Andr.) Walp.	bleeding heart

## Cruciferae           Mustard Family

<u>Arabidopsis thaliana</u> (L.) Schur	mouse-ear cress
<u>Arabis glabra</u> (L.) Bernh.	towermustard
<u>A. lyrata</u> L.	lyreleaved rockcress
<u>Barbarea orthoceras</u> Ledeb.	American wintercress
<u>Capsella bursa-pastoris</u> (L.) Medic.	shepherd's- purse
<u>Cardamine diogosperma</u> Nutt.	Little western bittercress
<u>C. pennsylvanica</u> Muhl.	bittercress
<u>Rorippa curvisiliqua</u> (Hook) Bessey	western yellowcress
<u>R. islandica</u> (Oed.) Borbas	marsh yellowcress

## Crassulaceae           Stonecrop Family

<u>Sedum</u> sp.	stonecrop
------------------	-----------

## Saxifragaceae       Saxifrage Family

<u>Heuchera micrantha</u> Dougl.	smallflowered alumroot
<u>Mitella trifida</u>	Pacific mitrewort
<u>Saxifraga bronchialis</u> L.	spotted saxifrage
<u>S. occidentalis</u> Wats. var. <u>rufidula</u>	western saxifrage
<u>Tellima grandiflorum</u> (Pursh) Dougl.	fringecup
<u>Tiarella trifoliata</u> L. var. <u>unifoliata</u>	coolwort foamflower
<u>Tolmiea menziesii</u> (Pursh) T. & G.	youth-on-age

## Grossulariaceae     Currant or Gooseberry Family

<u>Ribes bracteosum</u> Dougl.	stink currant
<u>R. divaricatum</u> Dougl.	straggly gooseberry
<u>R. lacustre</u> (Pers.) Poir.	swamp gooseberry
<u>R. sanguineum</u> Pursh.	redflower currant
<u>R. Triste</u> Pall.	wild red currant

## Hydrangeaceae       Hydrangea Family

<u>Philadelphus lewisii</u> Pursh	mockorange
-----------------------------------	------------

## Rosaceae           Rose Family

<u>Amelanchier unifolia</u> Nutt. var. <u>cusickii</u> (Fern.) Hitch.	Saskatoon berry
<u>A.a. var. semiintegrifolia</u> (Hook.) Hitchc.	Saskatoon berry.
<u>Aruncus sylvester</u> Kostel.	goatsbeard
<u>Crataegus douglasii</u> Lindl.	black hawthorn

<u>Fragaria vesca</u> L. var. <u>crinita</u> (Rydb.) Hitchc.	woods strawberry
<u>F. virginiana</u> Duchesne	wild strawberry
<u>Geum macrophyllum</u> Willd. var. <u>macrophyllum</u>	large-leaved aven
<u>Holodiscus discolor</u> (Pursh) Manim.	ocean-spray
<u>Physocarpus capitalus</u> (Pursh) Huntze	Pacific ninebark
<u>Potentilla fruticosa</u> L.	shrubby cinquefoil
<u>Potentilla glandulosa</u> Lindl. var. <u>glandulosa</u>	sticky cinquefoil
<u>P. gracilis</u> Dougl. var. <u>permollis</u>	slender cinquefoil
<u>P. norvegica</u> L.	Norwegian cinquefoil
<u>P. rivalis</u> Nutt.	river cinquefoil
<u>Prunus emarginata</u> (Dougl.) Walp.	bitter cherry
<u>P. virginiana</u> L.	chokecherry
<u>Pyrus fusca</u> Raf.	western crabapple
<u>Rosa gymnocarpa</u> Nutt.	little wild rose
<u>R. nutkana</u> Presl.	Nootka rose
<u>R. woodsii</u> Lindl. var. <u>woodsii</u>	Wood's rose
<u>Rubus idaeus</u> L. var. <u>sachalinensis</u> (Levl.) Focke	red raspberry
<u>R. leucodermis</u> Dougl.	blackcap raspberry
<u>R. parviflorus</u> Nutt.	thimbleberry
<u>R. pedatus</u> J.E. Smith	trailing raspberry
<u>R. spectabilis</u> Pursh	salmonberry
<u>R. ursinus</u> Cham. & Schlecht.	Pacific blackberry
<u>Sorbus scopulina</u> Greene	Cascade mountain-ash
<u>S. sitchensis</u> Roemer	Sitka mountain-ash
<u>Spirea betulifolia</u> Pall.	flat-top spirea
<u>S. douglasii</u> Hook.	hardhack
<u>S. pyramidata</u> Greene	pyramidal spirea

Leguminosae Pea family

<u>Lathyrus nevadensis</u> Wats.	purple pea
<u>Lupinus latifolius</u> Aparth. var. <u>thompsonianus</u>	broadleaf lupine
<u>L. polyphyllus</u> Lind.	large-leaved lupine
<u>L. sericeus</u> Pursh	silky lupine
<u>Thermopsis montana</u> Nutt.	buckbean
<u>Trifolium agrarium</u> L.	yellow clover
<u>T. dubrium</u> Sibth.	least hop clover
<u>T. repens</u> L.	white clover
<u>Vicia americana</u> Muhl. var. <u>truncata</u> (Nutt.) Brew.	American vetch

Callitrichaceae Water-starwort Family

<u>Callitriche verna</u>	spring water star-wort
--------------------------	------------------------

Celastraceae Staff-tree Family

<u>Pachistima myrsinites</u> (Pursh) Raf.	false box
---	-----------

Aceraceae	Maple Family	
	<u>Acer circinatum</u> Pursh	vine maple
	<u>A. glabrum</u> Torr. var. <u>douglasii</u> (Hook) Dippel	Douglas maple
	<u>A. macrophyllum</u> Pursh.	broadleaf maple
Rhamnaceae	Buckthorn Family	
	<u>Ceanothus sanguineus</u> Pursh.	redstem ceanothus
	<u>C. velutinus</u> Dougl.	sticky-laurel
	<u>Rhamnus purshiana</u> D.C.	cascara
Hypericaceae	St. John's-wort Family	
	<u>Hypericum perforatum</u> L.	common St. John's-wort
Elatinaceae	Waterwort Family	
	<u>Elatine triandra</u> Schkuhr	waterwort
Violaceae	Violet Family	
	<u>Viola adunca</u> Sm.	hook violet
	<u>V. glabella</u> Nutt.	stream violet
Elaeagnaceae	Oleaster Family	
	<u>Shepherdia canadensis</u>	soopolallie
Onagraceae	Evening Primrose Family	
	<u>Epilobium angustifolium</u> L.	fireweed
	<u>E. glandulosum</u> Lehm.	common willow-herb
	<u>E. minutum</u> Lindl.	small-flowered willow-herb
	<u>E. paniculatum</u> Nutt.	autumn willow-herb
	<u>E. watsonii</u> Barbey	Watson's willow-herb
Hippuridaceae	Mare's-tail Family	
	<u>Hippuris vulgaris</u> L.	common mare's-tail
Araliaceae	Ginseng Family	
	<u>Oplopanax horridum</u> (Smith) Mig.	devil's club
Umbelliferae	Parsley Family	
	<u>Cicuta douglasii</u> (D.C.) Coult & Rose	western water-hemlock
	<u>Heracleum lanatum</u> Michx.	cow-parsnip
	<u>Lomatium ambiguum</u> (Nutt.) Coult. & Rose	small desert parsley
	<u>Osmorhiza chilensis</u> (H. & A.)	mountain sweet-cicely
	<u>O. purpurea</u> (Coult & Rose Suksd.)	purple sweet-cicely

## Cornaceae

## Dogwood Family

Cornus canadensis L.  
C. stolonifera Michx.

bunchberry  
red-osier dogwood

## Ericaceae

## Heath Family

Arctostaphylos uva-ursi (L.) Spreng.  
Cassiope sp.  
Chimaphila menziesii (R. Br.) Spreng.  
C. umbellata (L.) Bart.  
Gaultheria ovatifolia Gray  
G. shallon Pursh  
Hypopitys manotropa Crantz.  
Ledum glandulosum Nutt.  
L. groenlandicum Oeder  
Menziesia ferruginea Smith  
Monotropa uniflora L.  
Pterospora andromedea Nutt.  
Pyrola asarifolia Michx.  
P. chlorantha Siv.  
P. minor L.  
P. picta Smith  
P. secunda L.  
Rhododendron albiflorum Hook.  
R. macrophyllum G. Don.  
Vaccinium alaskaense Howell  
V. deliciosum Piper  
V. membranaceum Dougl.  
V. parvifolium Smith  
V. ovalifolium Smith  
V. scoparium Leiberg

kinnikinnick  
white moss-heather  
little pipaissewa  
common pipsissewa  
western teaberry  
salal  
pinesap  
mountain labrador tea  
bog labrador tea  
false azalea  
Indian pipe  
pinedrops  
large pyrola  
green pyrola  
lesser pyrola  
white-veined pyrola  
one-sided pyrola  
white rhododendron  
Pacific rhododendron  
Alaska blueberry  
blue-leaf huckleberry  
thin-leaved blueberry  
red huckleberry  
oval-leaf huckleberry  
grouseberry

## Primulaceae

## Primrose Family

Trientalis latifolia Hook.

starflower

## Apocynaceae

## Dogbane Family

Apocynum androsaemifolium L.

spreading dogbane

## Polemoniaceae

## Phlox Family

Collomia linearis Nutt.  
Microsteris gracilis (Hook.)  
Greene var. gracilis  
Phlox diffusa Benth.

narrow-leaf collomia  
pink microsteris

## Hydrophyllaceae

## Waterleaf Family

Hydrophyllum capitatum Dougl.  
Phacelia heterophylla Pursh.

ballhead waterleaf  
varileaf phacelia



## Boraginaceae

## Borage Family

Myostis laxa Lehm.

small-flowered forget-me-not

## Labiatae

## Mint Family

Mentha arvensis L.

Canada mint

Prunella vulgaris L.

self-heal

## Scrophulariaceae

## Figwort Family

Castilleja angustifolia (Nutt.) Don

northwestern paintbrush

C. miniata Dougl.

scarlet paintbrush

var. miniataCollinsia grandiflora Lindl.

large-flowered blue-eyed-Mary

C. parviflora Lindl.

small-flowered blue-eyed-Mary

Mimulus alsinoides Dougl.

chickweed monkey-flower

M. guttatus D.C.

yellow monkey-flower

M. Lewisii Pursh

Lewis' monkey-flower

M. moschatus Dougl.

musk flower

Pedicularis racemosa Dougl.

sickle-top lousewort

var. alba (Pennell) Cronq.Penstemon davidsonii Green

Davidson's penstemon

P. ovatus Dougl.

broad-leaved penstemon

P. serrulatus Menzies

coast penstemon

Verbascum thapsus L.

common mullein

Veronica americana Schwein.

American brooklime

V. peregrina L.

purslane speedwell

V. serpyllifolia L. var.

thyme-leaved speedwell

. humifusa (Dickson) Vahl.

## Plantaginaceae

## Plantain Family

Plantago lanceolata L.

English plantain

P. major L. common plantain

## Rubiaceae

## Madder Family

Galium aparine L.

goose-grass

G. boreales

northern bedstraw

G. trifidum L.

small bedstraw

G. triflorum Michx.

fragrant bedstraw

## Caprifoliaceae

## Honeysuckle Family

Linnaea borealis L.

twinflor

Lonicera ciliosa (Pursh.) D.C.

orange honeysuckle

L. dioica L. var. glaucescens

red honeysuckle

(Rydb.) Butters

L. involucrata (Rich.) Banke

black twinberry

Sambucus cerulea Raf.

blue elderberry

S. racemosa L. var. aborescens

red elderberry

(T. &amp; G.) Gray

<u>Symphoricarpos albus</u> (L.) Blake	snowberry
<u>Viburnum edule</u> (Michx.) Raf.	squashberry
Valerianaceae	Valerian Family
<u>Valeriana sitchensis</u> Bong.	Sitka valerian
Campanulaceae	Harebell Family
<u>Campanula rotundifolia</u>	Scottish bluebell
Compositae	Aster Family
<u>Anthemis</u> sp.	chamomile
<u>Achillea millefolium</u> L.	yarrow
<u>Adenocaulon bicolor</u> Hook.	pathfinder
<u>Agoseris aurantiaca</u> (Hook.) Green var. <u>agrantiaca</u>	orange agoseris
<u>Anaphalis margaritacea</u> (L.) B. & H.	pearly everlasting
<u>Antennaria microphylla</u> Rydb.	rosy pussytoes
<u>A. neglecta</u> var. <u>attenuata</u> (Fern.) Cronq.	field pussytoes
<u>A. racemosa</u> Hook.	raceme pussytoes
<u>Arctium</u> sp.	burdock
<u>Arnica cordifolia</u> Hook. var. <u>cordifolia</u>	heart-leaf arnica
<u>A. mollis</u> Hook.	hairy arnica
<u>Aster</u> sp.	wild aster
<u>Chrysanthemum leucanthemum</u> L.	axeye daisy
<u>Cirsium edule</u> Nutt.	Indian thistle
<u>C. hookerianum</u> Nutt.	white thistle
<u>Crepis barbiger</u> Leib.	bearded hawkbeard
<u>Erigeron peregrinus</u> (Pursh) Greene var. <u>callianthus</u> (Greene) Cronq.	wondering daisy
<u>E. philadelphicus</u> L.	common fleabane
<u>E. speciosus</u> (Lind.) D.C.	large purple fleabane
<u>Eriophyllum lanatum</u> (Pursh) Forbes. var. <u>lanatum</u>	woolly sunflower
<u>Hieracium albiflorum</u> Hook.	white-flowered hawkweed
<u>H. canadense</u> Michx.	Canada hawkweed
<u>H. gracile</u> Hook.	slender hawkweed
<u>Hypochaeris radicata</u> L.	hairy cats-ear
<u>Matricaria matricariodes</u> (Less.) Porter	pineapple weed
<u>Senecio indecatus</u> Greene	mountain ragwort
<u>S. pauperculus</u> Michx.	balsam groundsel
<u>S. pseudoaureus</u> Rydb.	streambank butterweed
<u>Solidago canadensis</u> L.	Canada goldenrod
<u>Sanchus</u> sp.	sow-thistle
<u>Tanacetum vulgare</u> L.	common tansy
<u>Taranacum ceratophorum</u> (Ledeb.) D.C.	horned dandelion
<u>T. officinale</u> Weber	common dandelion
<u>Tragopogon dubius</u>	salsify

## Potamogetonaceae      Pondweed Family

Potamogeton pectinatus L.      sago pondweed  
P. gramineus L.      grass-leaved pondweed

## Juncaceae      Rush Family

Juncus acuminatus      tapered rush  
J. effusus L.      common rush  
J. ensifolius Wiket.      dagger-leaf rush  
J. filiformis L.      thread rush  
J. tenuis Willd.      slender rush  
Luzula campestris (L.) DC.      field woodrush  
L. parviflora (Ehrh.) Desv.      smallflowered woodrush

## Cyperaceae      Sedge Family

Carex canescens Bailey      gray sedge  
C. cusickii Mack.      Cusick's sedge  
C. deweyana Schw.      Dewey's sedge  
C. hoodii Boott      Hood's sedge  
C. lenticularis Michx.      sedge  
C. limnophila Hermann      pond sedge  
C. mertensii Prescott      Merten's sedge  
C. pachystachya Cham.      thick-headed sedge  
C. rossii Boott      Ros sedge  
C. rostrata Stokes      beaked sedge  
Scirpus microcarpus Presl.      small-fruit bulrush

## Gramineae      Grass Family

Agropyron repens (L.) Beauv.      quackgrass  
A. spicatum (Pursh.)  
 Scribn. & Smith      bluebunch wheatgrass  
Agrostis alba L. var.  
palustris (Huds.) Pers.      creeping bentgrass  
A. exarata Trin.      spike bentgrass  
Aira caryophyllea L.      silver hairgrass  
Alopecurus aequalis Sobol.      little meadow-foxtail  
Anthoxanthum odoratum L.      sweet vernalgrass  
Bromus anomalus Rupr.      nodding brome  
B. carinatus H. & A.  
 var. carinatus      California brome  
B.c. var. linearis      California brome  
B. mollis L.      soft brome  
Calamagrostis canadensis  
 (Michx.) Beauv.      bluejoint reedgrass  
C. rubescens Buckl.      pinegrass  
Deschampsia elongata (Hook.) Munro      slender hairgrass  
Elymus glaucus Buckl. var. glaucus      blue wildrye  
Festuca arundinacea Schreb.      reed fescue  
F. occidentalis Hook.      western fescue  
F. rubra L.      red fescue  
Glyceria elata (Nash) Jones      tall mannagrass  
G. grandis Wats.      reed mannagrass  
Holcus lanatus L.      common velvet-grass  
Lolium perenne L.      perennial ryegrass

<u>Phalaris arundinacea</u> L.	reed canarygrass
<u>Phleum alpinum</u> L.	mountain timothy
<u>P. pratense</u> L.	common timothy
<u>Poa annua</u> L.	annual bluegrass
<u>P. interior</u> Rydb.	inland bluegrass
<u>P. leptocoma</u> Trin.	bog bluegrass
<u>P. palustris</u> L.	fowl bluegrass
<u>P. pratensis</u> L.	Kentucky bluegrass
<u>P. sandbergeri</u> Vasey	Sandberg's bluegrass
<u>P. trivialis</u> L.	roughstalk bluegrass
<u>Stipa occidentalis</u> Thurb. var. <u>minor</u>	small needlegrass
<u>Trisetum canescens</u> Buckl.	tall trisetum

Typhaceae                      Cat-tail Family

Typha latifolia                      common cat-tail

Araceae                      Arum or Calla-lily Family

Lysichitum americanum                      skunk cabbage  
Hulten & St. John

Liliaceae                      Lily Family

<u>Allium accuminatum</u> Hooker	Hooker's onion
<u>Clintonia uniflora</u> (Schult.) Kunth.	queen's cup
<u>Disporum hookeri</u> (Torr.) Britt.	Hooker fairybells
<u>D. trachycarpum</u> (Wats.) Benth. & Hook.	rough fairy bells
<u>Erythronium montanum</u> Wats.	avalanche lily
<u>Fritillaria lanceolata</u> Pursh	chocolate lily
<u>Lilium columbianum</u> Hanson	tiger lily
<u>Smilacina racemosa</u> (L.) Desf.	false solomon's seal
<u>S. stellata</u> (L.) Desf.	star-flowered solomon's seal
<u>Streptopus amplexifolius</u> (L.) D.C.	twisted stalk
<u>Trillium ovatum</u> Pursh.	western trillium
<u>Veratrum vivide</u> Ait.	Indian hellebore
<u>Zigodenus venenosus</u> Wats.	meadow death-camas

Orchidaceae                      Orchid Family

<u>Calypso bulbosa</u> (L.) Oakes.	false lady-slipper
<u>Corallorhiza maculata</u> Raf.	spotted coralroot
<u>Goodyera oblongifolia</u> Raf.	rattlesnake plantain
<u>Habenaria orbiculata</u> (Pursh) Torr.	round-leaved rein-orchid
<u>H. unalascensis</u> (Spreng.) Wats	slender-spire orchid
<u>Listera caurina</u> Piper	western twayblade
<u>Spiranthes romanzoffiana</u> Cham. var. <u>romanzoffiana</u>	hooded ladies-tresses

APPENDIX II \*  
VERTEBRATE SPECIES RECORDED  
IN THE  
SKAGIT VALLEY IN CANADA

This Appendix is an inventory of all vertebrate species, by common name only, which have been recorded in the Skagit Valley in Canada. The table indicates the population status of each species, identifying them as common, uncommon, or rare. If the species occupy the Valley during the breeding season they have been classed as resident. The probable effect of High Ross Reservoir on each species is based on the best knowledge to date.

In addition to those actually observed, certain avian species may occur in the Skagit Valley, based on their known occurrence adjacent to the Valley, or in similar habitats elsewhere in the Province. These avian species are tabulated with their population status and anticipated reservoir effects.

\* From:  
International Joint Commission, Canada & U.S., 1971.  
Environmental and Ecological Consequences in Canada of  
Raising Ross Lake in the Skagit Valley to Elevation 1725.

GAME ANIMAL SPECIES	POPULATION STATUS				RESERVOIR EFFECTS			
	Common	Uncommon	Rare	Resident	Increase	Decrease	No change	Unknown
Mule Deer Black-tailed Deer White-tailed Deer Roosevelt Elk Moose	X X		X X X	X X X		X X X		X X
Goat Grizzly Bear Black Bear Cougar Coyote		X	X	X X X		X X X	X X	
Snowshoe Hare Blue Grouse Ruffed Grouse Franklin Grouse White-tailed Ptarmigan	X X X		X X	X X X X		X X X	X	X
Mallard Pintail Green-winged Teal Blue-winged Teal Cinnamon Teal	X	X X X	X	X X		X X	X X X	
American Widgeon Shoveller Wood Duck Ring-necked Duck Canvasback	X X	X X X				X	X X X	
Greater Scaup Lesser Scaup Common Goldeneye Barrows Goldeneye Bufflehead	X	X	X X X	X			X X X X	
Canada Goose Common Snipe		X X		X X		X X		

FUR SPECIES	POPULATION STATUS				RESERVOIR EFFECTS			
	Common	Uncommon	Rare	Resident	Increase	Decrease	No change	Unknown
Red Squirrel	X			X		X		
Douglas Squirrel	X			X		X		
Lynx			X	X			X	
Bobcat	X			X		X		
Raccoon		X		X		X		
Beaver	X			X		X		
Marten		X		X		X		
Fisher			X	X				X
Ermine	X			X		X		
Mink		X		X		X		
Wolverine			X	X			X	
Striped Skunk			X	X		X		
River Otter		X		X			X	
Muskrat			X	X				X

NON-GAME SPECIES	POPULATION STATUS				RESERVOIR EFFECTS			
	Common	Uncommon	Rare	Resident	Increase	Decrease	No change	Unknown
Hoary Marmot Spotted Skunk Porcupine Shrew Mole	X	X	X X	X X X		X	X X	X
Shrew - <i>S. cinereus</i> sp. <i>S. vagrans</i> sp. <i>S. palustris</i> Deer mouse - <i>P. maniculatus</i> and <i>P. oreus</i> Wood Rat	X X		X	X X X		X X X		
Long-tailed Vole Townsend's Vole Creeping Vole Red-backed Vole Jumping Mouse	X X X		X	X X X X		X X X X		
Northwest Chipmunk Townsend Chipmunk Flying Squirrel Mantled Ground Squirrel Mountain Beaver	X X	X X	X	X X X		X X X	X X	
Pika Long-toed Salamander Northwest Salamander Northwestern Toad Pacific Tree Toad	X X	X X X		X X X X		X X X X	X	
Tailed Toad Red-legged Frog Northern Alligator Lizard Western Skink Rubber boa	X X		X X	X X X X		X X		X X



NON-GAME SPECIES (cont'd)	POPULATION STATUS				RESERVOIR EFFECTS			
	Common	Uncommon	Rare	Resident	Increase	Decrease	No change	Unknown
Northwestern Garter Snake	X			X		X		
Puget Garter Snake		X		X		X		
Coast Garter Snake	X			X		X		
Common Loon	X			X			X	
Red-necked Grebe			X				X	
Horned Grebe		X					X	
Pied-billed Grebe			X	X			X	
Eared Grebe		X					X	
Western Grebe		X					X	
Harlequin	X			X		X		
White-tailed Scoter		X					X	
Hooded Merganser		X					X	
Common Merganser	X			X		X		
Red-breasted Merganser			X				X	
Great Blue Heron		X		X			X	
Goshawk		X		X		X		
Sharp-shinned Hawk		X		X		X		
Cooper Hawk			X	X		X		
Red-tailed Hawk	X			X		X		
Marsh Hawk		X					X	
Golden Eagle		X					X	
Bald Eagle		X				X		
Osprey			X	X			X	
Pigeon Hawk		X					X	
Sandhill Crane			X				X	
Virginia Rail		X		X		X		
American Coot		X					X	
Semipalmated Plover		X					X	
American Golden Plover		X					X	
Killdeer	X			X		X		

NON-GAME SPECIES (cont'd)	POPULATION STATUS				RESERVOIR EFFECTS			
	Common	Uncommon	Rare	Resident	Increase	Decrease	No change	Unknown
Long-billed Curlew Spotted Sandpiper Greater Yellowlegs Lesser Yellowlegs Pectoral Sandpiper	X		X	X		X	X	
Semipalmated Sand- piper Long-billed Dowitcher Glaucous-winged Gull California Gull Ring-billed Gull		X					X	
Band-tailed Pigeon Mourning Dove Screech Owl Horned Owl Pygmy Owl	X	X	X	X		X		
Spotted Owl Saw-whet Owl Poor-will Common Nighthawk Black Swift		X	X	X		X		X
Vaux's Swift Rufous Hummingbird Calliope Humming- bird Belted Kingfisher Red-shafted Flicker	X X X X			X X X X		X X X	X	
Pileated Woodpecker Yellow-bellied Sapsucker Hairy Woodpecker Downy Woodpecker Black-backed three- toed Woodpecker	X X X X		X	X X X		X X X		X

NON-GAME SPECIES (cont'd)	POPULATION STATUS				RESERVOIR EFFECTS			
	Common	Uncommon	Rare	Resident	Increase	Decrease	No change	Unknown
Northern three-toed Woodpecker		X		X				X
Eastern Kingbird		X		X		X		
Western Kingbird		X		X		X		
Traill's Flycatcher		X		X		X		
Hammond's Flycatcher	X			X		X		
Dusky Flycatcher		X		X		X		
Western Flycatcher			X	X		X		
Western Wood Peewee	X			X		X		
Olive-sided Flycatcher	X			X		X		
Horned Lark			X				X	
Violet-green Swallow	X			X		X		
Tree Swallow	X			X		X		
Bank Swallow			X				X	
Rough-winged Swallow	X			X			X	
Barn Swallow		X		X			X	
Cliff Swallow			X				X	
Gray Jay		X		X		X		
Steller's Jay		X		X		X		
Black-bioled Magpie		X				X		
Common Raven	X			X		X		
Common Crow	X			X		X		
Northwestern Crow			X			X		
Clark's Nutcracker			X	X		X		
Black-capped Chickadee		X		X		X		
Mountain Chickadee		X		X		X		

NON-GAME SPECIES (cont'd)	POPULATION STATUS				RESERVOIR EFFECTS			
	Common	Uncommon	Rare	Resident	Increase	Decrease	No change	Unknown
Chestnut-backed Chickadee	X			X		X		
Red-breasted Nuthatch	X			X		X		
Brown Creeper		X		X		X		
American Dipper	X			X		X		
House Wren		X		X		X		
Winter Wren		X		X		X		
American Robin	X			X		X		
Varied Thrush	X			X			X	
Hermit Thrush		X		X			X	
Swainson's Thrush	X			X		X		
Gray-cheeked Thrush			X				X	
Veery	X			X		X		
Western Bluebird		X					X	
Mountain Bluebird	X						X	
Townsend's Solitaire		X		X			X	
Golden-crowned Kinglet	X			X		X		
Ruby-crowned Kinglet	X			X			X	
Water Pipit		X		X		X		
Cedar Waxwing	X			X		X		
Loggerhead Shrike			X	X		X		
Common Starling	X			X		X		
Hutton's Vireo			X					X
Solitary Vireo			X	X				X
Red-eyed Vireo		X		X		X		
Warbling Vireo	X			X		X		

NON-GAME SPECIES (cont'd)	POPULATION STATUS				RESERVOIR EFFECTS			
	Common	Uncommon	Rare	Resident	Increase	Decrease	No change	Unknown
Tennessee Warbler			X	X		X		
Orange-crowned Warbler		X		X		X		
Nashville Warbler			X	X				X
Yellow Warbler	X			X		X		
Audubon's Warbler	X			X		X		
Black-throated Gray Warbler		X		X		X		
Townsend's Warbler	X			X		X		
Northern Water Thrush			X	X				X
Macgillivray's Warbler	X			X		X		
Common Yellow-throated Warbler	X			X		X		
Wilson's Warbler		X		X		X		
American Redstart		X		X		X		
Bobolink			X				X	
Western Meadowlark		X					X	
Yellow-headed Blackbird		X		X		X		
Redwinged Blackbird	X			X		X		
Bullock's Oriole		X		X		X		
Brewers Blackbird		X		X		X		
Brown-headed Cowbird	X			X		X		
Western Tanager	X			X		X		
Black-headed Grosbeak			X	X		X		
Lazuli Bunting			X				X	
Evening Grosbeak	X			X		X		
Purple Finch	X			X		X		
Pine Grosbeak		X		X			X	

NON-GAME SPECIES (cont'd)	POPULATION STATUS				RESERVOIR EFFECTS			
	Common	Uncommon	Rare	Resident	Increase	Decrease	No change	Unknown
Pine Siskin	X			X		X		
American Goldfinch		X		X		X		
Red Crossbill	X			X			X	
White-winged Crossbill			X				X	
Spotted Towhee		X		X		X		
Vesper Sparrow			X				X	
Lark Sparrow			X				X	
Slate-coloured Junco			X				X	
Oregon Junco	X			X		X		
Tree Sparrow			X			X		
Chipping Sparrow	X			X		X		
Harris' Sparrow			X				X	
White-crowned Sparrow		X		X		X		
Golden-crowned Sparrow		X					X	
Fox Sparrow			X				X	
Lincoln's Sparrow			X				X	
Song Sparrow	X			X		X		

AVIAN* SPECIES	POPULATION STATUS				RESERVOIR EFFECTS			
	Common	Uncommon	Rare	Resident	Increase	Decrease	No change	Unknown
American Bittern			X	X		X		
White-fronted Goose			X				X	
Gadwall		X				X		
Redhead		X					X	
Surf Scoter		X					X	
Turkey Vulture		X		X		X		
Rough-legged Hawk			X			X		
Sora Rail		X		X		X		
Black-bellied Plover		X					X	
Baird Sandpiper		X					X	
Least Sandpiper		X					X	
Dunlin		X					X	
Short-billed Dowitcher			X				X	
Wilson Phalarope		X					X	
Northern Phalarope		X					X	
Herring Gull		X					X	
Short-billed Gull		X					X	
Bonaparte Gull		X					X	
Common Tern		X					X	
Arctic Tern		X					X	
Black Tern		X					X	
Great Gray Owl			X			X		
Long-eared Owl		X		X		X		
Short-eared Owl		X		X		X		
Lewis Woodpecker		X		X		X		
Sayes Phoebe		X		X		X		
Common Bushtit		X		X		X		
White-breasted Nuthatch		X		X		X		
Pygmy Nuthatch		X		X		X		

\* These Avian Species may occur in the Skagit Valley in Canada. Data based on known occurrence adjacent to the valley or in similar habitats elsewhere in British Columbia.

AVIAN SPECIES (Cont'd)	POPULATION STATUS				RESERVOIR EFFECTS			
	Common	Uncommon	Rare	Resident	Increase	Decrease	No change	Unknown
Bewick Wren		X		X		X		
Long-billed Marsh Wren		X		X		X		
Catbird		X		X		X		
Bohemian Waxwing		X				X		
Northern Shrike		X				X		
Myrtle Warbler		X				X		
Chat			X	X		X		
Rusty Blackbird		X				X		
Cassin's Finch		X					X	
House Finch		X		X		X		
Rosy Finch		X					X	
Lark Bunting			X				X	
White-throated Sparrow			X			X		
McCowan Longspur			X			X		
Snow Bunting		X				X		