

taking over as leaders.

The average height of the canopy of the willow type is 12 feet.

Like the aspen type, the willow type commonly has Shepherdia canadensis and Pachystima myrsinites but willow cover has Epilobium angustifolium and Cornus canadensis in greater abundance in its understory than has the aspen cover.

Willow Type List. (Complete species list in Appendix I e.)

1. Salix spp.
2. Shepherdia canadensis
3. Pachystima myrsinites
4. Epilobium angustifolium
5. Populus tremuloides
6. Cornus canadensis
7. Aster sp.
8. Hieracium sp.
9. Vaccinium membranaceum
10. Anaphalis margaritacea
11. Pseudotsuga taxifolia
12. Pinus contorta
13. Gramineae group
14. Antennaria spp.
15. Populus trichocarpa

16. *Pyrola* spp.
17. *Castilleja* spp.
18. *Alnus* (*sinuata*)
19. *Rubus parviflorus*
20. *Betula papyrifera*
21. *Mahonia aquifolium*
22. *Aralia nudicaulis*.

Polytricum moss and species of foliose lichen make up most of the common moss and lichen growth.

6) Alder type. The alder are a difficult group to summarize. There appears to be two types of alder cover in the park. The first type growing commonly in wet swales is believed to be *Alnus tenuifolia*. The second type growing on damp mountain slopes is believed to be largely *Alnus sinuata*. (They shall be referred to by these names hereafter).

A certain amount of distinction should be made between these two types.

The *A tenuifolia* has an average canopy height of 24 feet while the average height of canopy of *A sinuata* is 13 feet. Unlike the former species, *A sinuata* is often found mixed with willow. Of the conifers, *Picea engelmanni* is frequent in both alder types but *Pinus contorta* is found only in the dryer *A sinuata* type.

The understory growing in alder stands has great variety. The most common plants are Lonicera involucrata and Linnaea borealis. Although no herbaceous plants dominate both alder types there are more of the succulent than shrubby species represented.

The understory of the two type of alder should be dealt with separately. A sinuata is quite similar to the willow or aspen cover-types with Pachystima myrsinites, Cornus canadensis and Epilobium angustifolium occurring commonly on this type. The A tenuifolia however has little or no Pachystima myrsinites represented but the succulent Galium boreale is found in three out of four samples.

Of the mosses, Polytricum spp. are found almost exclusively on the dryer alder type. A good representation of Mnium spp. plus other mosses and the ferns Athyrium filix - femina and Dryopteris spp. are found in the wet alder site. Equisetum spp. are noted to occur only in the samples taken in the A tenuifolia type, the conifer type and the meadow type.

Alder type list. (Complete species list in Appendix I f.)

1. Alnus tenuifolia
2. Alnus sinuata
3. Salix spp.

4. *Lonicera involucrata*
5. *Linnaea borealis*
6. *Picea engelmanni*
7. *Cornus stolonifera*
8. *Pachystima myrsinites*
9. *Cornus canadensis*
10. *Epilobium angustifolium*
11. *Galium boreale*
12. Gramineae group
13. *Ribes* spp.
14. *Rosa* spp.
15. *Rubus* spp.
16. *Pyrola* spp.
17. *Rubus parviflorus*

Polytricum and Mnium moss, Atherium filix-femina and Dryopteris Linnaeana as well as Equisetum spp. are quite common.

7) Brush Type. The brush type includes the most arid site described in this classification. It includes the shrub - like growth covering the south facing sides of hills, rock slides or sandy knolls.

The brush cover-type has a low site quality. It has an average canopy height of only two feet.

Although this classification covered different substrates it is very probable that, if any brush type were visited, some if not all of the following shrubs would be present: Ceanothus sanguineus, Amelanchier spp., and Symphoricarpus albus. The type of cover is largely shrubby with few herbaceous plants. This is the most likely cover-type in which to find; Penstemon sp, Ceanothus velutinus, Prunus virginiana demissa and Heuchera ovalifolia.

Brush Type List. (Complete species list in Appendix I g.).

1. Ceanothus sanguineus
2. Gramineae group
3. Amelanchier spp.
4. Symphoricarpus albus
5. Spirea lucida
6. Penstemon sp.
7. Ceanothus velutinus
8. Rosa spp.
9. Mahonia aquifolium

10. *Apocynum androseamifolium*
11. *Aster* sp.
12. *Populus tremuloides*
13. *Prunus virginiana demissa*
14. *Pachystima myrsinites*
15. *Rubus* spp.
16. *Epilobium angustifolium*
17. *Sonchus* spp.
18. *Viola* spp.
19. *Fragaria* spp.
20. *Antennaria* spp.
21. *Heuchera oralifolia*

8) Meadow Type. *Sphagnum* bogs, sedge-grass meadows and bog-birch flats are included in the meadow type. These are very wet areas with a unique plant composition. Only plants that can undergo months of spring flooding can exist on this type.

The plants, with an average height of canopy of three feet, are dominated by the Cyperaceae group and *Betula glandulosa*. *Sphagnum* spp. dominate the moss layer. In the few samples that were taken the meadow type seemed to have very little variation in composition.

Meadow Type List. (Complete species list in Appendix

I h.)

1. Cyperaceae group.
2. Betula glandulosa
3. Salix spp.
4. Pinus contorta
5. Ledum groenlandicum
6. Menyanthes trifoliata
7. Gramineae group
8. Picea engelmanni
9. Kalmia polifolia
10. Andromeda polifolia
11. Chiogenes hispidula
12. Vaccinium oxycoccus var. intermedium
13. Habenaria (leuctostachys)
14. Spiranthea romanzoffiana
15. Eriophorum chamissonis
16. Rubus spp.
17. Potentilla palustris.

Sphagnum predominates the moss layer but Mnium is also found in the meadow type.

B. Major Plants found in the Low Elevations

The plant check list, Appendix III includes all plants encountered during this study plus other known species.

The plants in the check list, with values designated, are species which occurred in the burn or surrounding coniferous stands (Appendix III). The values are the sums of the abundance - vigor values from individual types. The burn types, especially willow, dominate the trend of these results.

The Salix group is the most abundant representative found at low elevations. Populus tremuloides is the most common deciduous tree and Pseudotsuga taxifolia is the most common conifer. The most abundant low shrub species is Pachystima myrsinites while Epilobium angustifolium is the most widespread herbaceous plant.

The Major Plants of the Low Elevations (In order of abundance):

1. Salix spp.
2. Pachystima myrsinites
3. Shepherdia canadensis
4. Populus tremuloides
5. Pseudotsuga taxifolia
6. Cornus canadensis
7. Pinus contorta
8. Linnaea borealis
9. Epilobium angustifolium

10. *Picea engelmanni*
11. Gramineae group
12. *Betula papyrifera*
13. *Vaccinium membranaceum*
14. *Rubus* spp.
15. *Alnus sinuata*
16. *Hieracium* sp.
17. *Spiraea lucida*
18. *Aralia nudicaulis*
19. *Aster* sp.
20. *Rubus parviflorus*
21. *Thuja plicata*
22. *Populus tricarpa*
23. *Rosa* spp. (nutkana)
24. *Mahonia aquifolium*
25. *Pyrola secunda*

C. Age Studies

Age studies of the growth on the burns revealed that the deciduous trees come in slightly before conifers.

The average age of the conifers in the burn is 25 years. As would be expected it took about five years for the first conifers to become established.

D. Tree Species Previous to Fire

The study of the snags to determine the make up of the previous forest should have been more thorough. Cedar and fir snags were easy to recognize while other species were most often missed.

Cedar predominated in areas where alder now occurs. Pine was not a common species before the burn. Hemlock must have been present in great numbers before the fire but few snags were so identified. Decay may remove evidence of hemlock more rapidly than evidence of other species. Douglas fir appeared to be widespread before the burn and grew to diameters of three to four feet. It was especially common on the dry ridges now covered with willow.

Part II

A. Sub-alpine Vegetation Study

Six areas were studied in the sub-alpine of Battle Mountain. The samples all lay between the elevations of 4500 and 6000 feet. In this very limited number of samples, five distinct cover-types were analyzed. The major species of the sub-alpine were recorded.

The plant lists in this work are in order of descending abundance. However, the frequency of occurrence would have to be checked further to determine accurately the most common species of each type. It is for this reason that the complete plant list is given with each type rather than only the most abundant species as in the low elevation descriptions.

The five types described were: 1). The climax forest of the sub-alpine. 2). The burned areas where only scattered conifers remain. 3). The arid meadow type such as borders. Fight Lake. 4). The damp meadow slopes covered with profuse succulent growth. 5). The heath covered ridges.

The field notes were made from August 10 to August 17, therefore, some early blooming plants may have been missed. However, the author spent some time in June checking the leaves and flowers of early blooming anemones, marygolts, etc., so that leaves only could be easily recognized later in the year.

B. Sub-alpine Cover-Types

1) Sub-alpine Climax Forest. The distribution of the alpine fir-engelmann spruce forest varies considerably with aspect. These trees grow at higher elevations on north slopes than on south slopes and many have different flora in the understory depending on aspect. It is the most common forest type found between elevations of 3500 and 6000 feet.

Two samples were taken in the climax forest type, each at an elevation of about 5,500 feet. The samples were taken on almost level terrain. The influence of meadows is undoubtedly felt in the areas studied, therefore, this floristic description is not typical of the very dense sub-alpine forest.

Soils in the study areas were typical sub-alpine pod-sols. Alpine fir and Engelmann spruce are the major tree species with alpine fir being the dominant species. Alpine fir usually reaches a d.b.h. of 15 to 20 inches and a corresponding height of about seventy-five feet at an age of 200 years. Engelmann spruce grows to the following dimensions: (One large typical tree measured): d.b.h., 31.2 inches; height, about one hundred feet; age, 310 years. Spruce seems to have a slightly longer life span.

Alpine fir seedlings are coming in on the edges of many of the meadows. This advance is difficult to explain. There may be either a meadow - conifer rotation in the sub-alpine or the natural timberline may be advancing to higher elevations with a continental climatic change. It should be noted also that these advancing seedlings, as they become dense, are probably very susceptible to the, Brown Felt Blight. (Herpothrichia sp.) which is common in the sub-alpine.

The alpine fir - engelmann spruce forest is a climax type. In this forest an equilibrium has been reached between the forest trees and the plants of understory. These understory inhabitants are few in number and less variable than plants in ^{burn} types. The type of forest studied might well be called an, Abies lasiocarpa - Valeriana sitcheusis - Mitalla breweri, Tierella unifoliata - Vaccinium association.

Sub-alpine Climax Forest Type List

Abies lasiocarpa

Valeriana sitchensis

Mitella breweri

Arnica latifolia

Vaccinium membranaceum

Tiarella unifoliata

Gramineae group

Picea engelmanni

Hieracium sp.

Epilobium sp.

Veratrum viride

Saxifrage sp.

Pedicularis bracteosa

The mosses are predominately:

Mnium and Dicranum spp.

2) Sub-alpine Burn Type. Burns have left large areas of the parks sub-alpine country covered with dry snags. These remnants of the previous forest remain hard for many years probably due largely to the cool temperatures which inhibit the action of decaying fungus.

Regeneration is slow and spotty. This is due to a poor seed source, poor growing site and the heavy competition from dense thickets of false azalea and white rhododendron. The alpine burn type, therefore, forms quite a stable niche for wildlife.

The sample taken in the burn was on a west facing slope at about 4,700 feet elevation. A conifer kill of about seventy percent resulted from the fire; therefore a fairly good seed source was available and alpine fir was a dominant species.

Sub-alpine Burn Type List

Abies lasiocarpa

Rhododendron albiflorum

Valeriana sitchensis

Disporum oregonum

Menziesia ferruginea

Arnica latifolia

Rubus pedatus

Vaccinium membranaceum

Lupinus spp.

Epilabium angustifolium

Picea engelmanni

Sorbus sitchensis

Veratrum viride

Clintonia unifoliata

Hieracium sp.

Pyrola secunda

Gramineae group

Erigeron salsuginosis

Viola spp.

Tiarella unifoliata

Mitella breweri

3) The Arid Sub-alpine Meadow Type. Some of the low rather level meadows have a very thin humus layer over a rocky or clay soil. These areas dry out in the hot summer months. The cover seldom exceeds six inches in heights and appears as if it were being produced on an arid plain.

One sample was taken near Fight Lake at about 5,500 feet elevation. This type is the least typical of any of the sub-alpine floristic descriptions. However, grasses are abundant in any of these areas with variation occurring in the lesser plants.

Arid Meadow Type List.

Gramineae group (Phleum alpinum)

Sibaldia procumbeus

Cyperaceae group

Erigonum sp.

Senecio triangularis

Vaccinium caespitosum

Gentiana (calycosa)

Potentilla diversiloba

Epilobium sp.

Antennaria spp.

Caltha leptosepala

Erigeron salsuginosus

Castilleja spp.

Polytricum is the most common moss type with local concentration of sphagnum also being found.

4) Moist Sub-alpine Slope Type. Dense flowering herbs, one to two feet tall on moist slopes are the most attractive features of the sub-alpine. The peak of the blossoming period is from early to mid - August.

The soil here is deep and black with a high moisture content supplied by a seepage action. One area was studied in this type at about 5,500 feet elevation on a south facing slope.

Moist Slope Type List.

Senecio triangularis

Erigeron salsuginosis

Valeriana sitchensis

Castilleja spp.

Arnica latifolia

Lupinus spp.

Veratnum (viride)

Anemone occidentalis

Leptarrhena amplexifolia

Mimulus lewisii

} Locally near
running water.

Clatonia lanceolata

Trollius laxus

Pedicularis bracteosa

Artemisia longepedunculata

Gramineae group (Phleum alpinum)

Cyperaceae group

5) Dry Heath Ridge Type. On dry ridges and open knolls herbs give way to the more hardy shrubs. The heath growing between the clumps of alpine fir make up the transition type known as timber line: The ^{border} harder between the highest trees and the rocky slopes above.

Dry Heath Ridge Type List

Phyllodoce empetrifomis

Cassiope mertensiana

Spirea pectinata

Antennaria spp.

Vaccinium caespitosum

Gramineae group

Gentiana (clycosa)

Erigeron salsuginosis

Arnica latifolia

Pedicularis bracteosa

Anemone occidentalis

Sibaldia procumbens

Lycopodium (annotonium) and Cladonia lichens was also found.

Yellow heather (Phyllodoce glanduliflora) was not found in this type but was observed on the higher alpine slopes.

III. DISCUSSION

Edwards (1954) described the extent of the destruction of the 1926 fire which denuded a large part of the south end of Wells Gray Park.

"In all, 60 percent of the vegetation below 4,000 feet has been reduced from climax forest to an early seral stage. Fire has drastically changed the vegetation of the valley. Catastrophic change in the ecology of the area is an inevitable result."

Continuing, Edwards described the comeback of the flora.

....."Fireweed and willow began to heal the land

in an environment suddenly suitable for them".....

Fire weed and willow are two of the first inhabitants of recent burns. However, for the first few years after a burn almost any seed that finds its way onto the area will become established. This results in regeneration of a variety of plants in a fire sere flora with little regulation as to site. The confusing admixture of plants that is present in the park burn is typical of burn flora. Climax forests on the other hand are rather well defined plant associations. The wide variety of plants found on the present burn will be modified slowly to form sub-climax and climax types. The immature sub-climax types found in this study are difficult to differentiate and are undergoing rapid change in composition. Individual types analyzed in this report should progress to individual sub-climax and climax types. It should be possible to follow these successions from immature to climax. If such succession can be recognized then management priority should be given to areas, both sub-climax and climax which produce the best browse plants at immature stages of development.

The conifers climax forests are important in the park for their timber value. However, priority must be given to the types that produce the best winter range at some stage in their development.

The essence of multiple use is to manage individual areas for maximum benefits. If priority is to be given to moose range, then management should follow this pattern:

1) At an expense to timber value the sub-climax types of best winter moose range should be held at this stage of development for some time.

2) Climax types producing the best winter range when burned should be the first to be logged and burned to produce more winter range.

Willow, so important as moose browse, predominates where there appears to be very dry surface conditions but an effective water table quite close to the soil surface. However, willow and its low growing relatives such as red osier, mountain ash etc., are being rapidly crowded out in areas which they do not dominate.

The advance coniferous regeneration was at the date of this study spreading its seed farther towards the center of the burned areas. It is putting on maximum height growth now and is effectively crowding out deciduous species. Douglas fir is the commonest species. Where sufficient seed is available regeneration is dense.

IV. RECOMMENDATIONS

1) Any active land management plan should include steps to get more willow growing at low elevations in the park. This may include the controlled use of fire.

2) Where Douglas fir is dense, pruning and thinning should be carried out now if a multiple use plan is to be later affected in the park.

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APPENDIX II.

TYPE SUMMARY TABLE

<u>SITE INDEX</u>	<u>ELEVATION</u> (ft.)	<u>HT. OF CANOPY</u> (ft.)	<u>SOIL MOIST.</u>	<u>SNAGS</u> (type for con.)
<u>CONIFER TYPE</u>				
60	2300	120	Damp	C-H-S
60	2400	100	Moist	F-H-C
80	2400	60	Moist	P1
140	2500	100	Damp	C-F-S
120	2500	75	Moist	F-P1
-	2500	80	Damp	S-B
120	2400	125	Damp	C-Ct
150	2800	45	Moist	S-C
80	2900	50	Damp	C
<u>150</u>	<u>3700</u>	<u>120</u>	<u>Moist</u>	<u>F</u>
AV. 110		90		
<u>REGENERATION TYPE</u>				
140	2200	45	Moist	C-F
200	2400	60	Moist	?
115	2500	40	Moist	F
125	2800	20	Moist	F
120	3300	25	Moist	F
140	3300	25	Damp	C-H-F
-	2500	30	Moist	F
-	2200	50	Moist	P1-F-C
-	2200	50	Dry	F-C-P1
170**	2300	50	Dry	P1-F
<u>150**</u>	<u>2300</u>	<u>40</u>	<u>Moist</u>	<u>P1-F</u>
AV. 140		40		

** Site Index based on pine.

APPENDIX II. (Cont'd.)

TYPE SUMMARY TABLE

<u>SITE INDEX</u>	<u>ELEVATION</u> (ft.)	<u>HT. OF CANOPY</u> (ft.)	<u>SOIL MOIST.</u>	<u>SNAGS</u>
<u>MIXED TYPE</u>				
190	2500	30	Dry	C-F
150	2900	30	Moist	?
-	<u>2500</u>	<u>15</u>	<u>Dry</u>	<u>?</u>
AV. (good)		25		
<u>ASPEN TYPE</u>				
100*	3000	35	Dry	F
170	2500	25	Moist	F
150	2400	40	Moist	F
-	2500	40	Moist	?
-	2100	40	Moist	F-C
-	3500	25	Dry	F
-	3500	28	Dry	C-?
-	2200	50	Dry	C-F
<u>190**</u>	<u>2100</u>	<u>40</u>	<u>Dry</u>	<u>F</u>
AV. 160		36		
<u>ALDER TYPE</u>				
-	2300	25	Muck & water	C
-	3000	10	Damp	C-F
140***	2800	27	Wet	C
100***	3300	20	Wet	-
-	2500	15	Moist	-
-	3000	15	Damp	C-F
-	<u>3500</u>	<u>25</u>	<u>Damp</u>	<u>F-C</u>
AV. ?		20		

* Site index based on Aspen.

** Site index based on Pine.

*** Site index based on Alder.

APPENDIX II. (Cont'd.)

TYPE SUMMARY TABLE

<u>SITE INDEX</u>	<u>ELEVATION</u> (ft.)	<u>HT. OF CANOPY</u> (ft.)	<u>SOIL MOIST.</u>	<u>SNAGS</u>
<u>WILLOW TYPE</u>				
140	2300	9	Dry	F
160**	2300	20	Dry	C
90**	2600	5	Dry	F
90**	2700	6	Dry	F
-	2800	6	Dry	F-P1
9				
90**	2900	10	Damp	C
-	3100	8	Dry	F-C
-	2900	11	Moist	?
-	2900	10	Moist	?
130	2800	20	Moist	C-F
-	2800	11	Dry	C-F
140	2800	12	Dry	F-C
-	3400	15	Dry	F
-	3400	22	Moist	C-F
-	3300	20	Dry	F
-	3400	12	Dry	F
100	2900	9	Moist	C
-	2500	8	Damp	?
-	3500	10	Dry	C-F
-	3500	12	Dry	F-C
AV. 120		12		

** Site Index based on pine.

APPENDIX II. (Cont'd.)

<u>SITE INDEX</u>	<u>ELEVATION</u> (ft.)	<u>HT. OF CANOPY</u> (ft.)	<u>SOIL MOIST.</u>	<u>SNAGS</u>
<u>BRUSH TYPE</u>				
-	2200	4	DRY	F
60	2300	1	Dry	F
-	<u>3100</u>	<u>2</u>	<u>Dry</u>	<u>-</u>
AV.		2	Dry	
<u>MEADOW TYPE</u>				
*	2800	3	Sphag. bog.	-
-	3300	3	Wet	-
-	<u>3500</u>	<u>2</u>	<u>Wet</u>	<u>-</u>
AV.		3	Wet	

APPENDIX III.

CHECK LIST.

<u>Species.</u>	<u>Abundance Value.</u> (Low elevation species)
Pseudotsuga taxifolia	64
Pinus contorta	63
Pinus albicaulis	
Picea engelmanni	45
Picea glauca	
Abies lasiocarpa	10
Thuja plicata	34
Tsuga heterophylla	14
Taxus brevifolia	
Juniperus communis	2
Populus tremuloides	73
Populus trichocarpa	34
Salix spp.	120
Betula papyrifera	41
Alnus sinuata	38
Alnus tenuifolia	20
Betula glandulosa	8
Acer glabrum	16
Sorbus sitchensis	9
Cornus stolonifera	16
Corylus californica	5
Prunus emarginata	2
Prunus virginiana demissa	2
Rubus spp.	40
Ribes spp.	7
Oplopanax horridus	2
Rosa spp. (nutkana)	31
Rhododendron albiflorum	
Menziesia ferruginea	4
Vaccinium ovalifolium	1
Vaccinium membranaceum	40
Shepherdia canadensis	74
Ceanothus velutinus	3
Ceanothus sanguineus	6
Amelanchier spp.	14
Viburnum pauciflorum	3
Viburnum trilobum	2
Lonicera involucrata	25
Kalmia polifolia	2
Andromeda polifolia	2
Ledum groenlandicum	3
Pachystima myrsinites	89
Symphoricarpus albus	8
Apocynum androseamifolium	11
Mahonia aquifolium	29
Spirea douglasii	4
Rubus pedatus	
Chiogenes hispidula	3
Vaccinium Oxycoccus var. intermedium	2
Linnaea borealis	57
Spirea pyramidata	1

APPENDIX III.

CHECK LIST (Cont'd.)

<i>Spiraea lucida</i>	38
<i>Arctostaphylos Uva-ursi</i>	11
<i>Empetrum nigrum</i>	
<i>Phyllodoce empetrifloris</i>	
<i>Phyllodoce glanduliflora</i>	
<i>Cassiope mertensiana</i>	
<i>Vaccinium caespitosum</i>	3
<i>Chimaphila umbellata</i>	26
<i>Penstemon</i> sp.	1
<i>Fragaria</i> spp.	17
<i>Epilobium angustifolium</i>	54
<i>Lilium parviflorum</i>	16
<i>Pyrola</i> spp.	19
<i>Pyrola secunda</i>	26
<i>Pyrola bracteata</i>	6
<i>Moneses uniflora</i>	
<i>Antennaria</i> spp.	17
<i>Antennaria rosea</i>	3
<i>Taraxacum</i> spp.	13
<i>Castilleja</i> spp.	18
<i>Rubus parviflorus</i>	35
<i>Calypso bulbosa</i>	5
<i>Aster</i> spp.	36
<i>Disporum oregonum</i>	10
<i>Cornus canadensis</i>	64
<i>Corallorhiza</i> spp.	1
<i>Anaphalis margaritacea</i>	21
<i>Habenaria</i> spp.	5
<i>Aralia nudicaulis</i>	37
<i>Aquilegia formosa</i>	$\frac{1}{2}$
<i>Clintonia unifoliata</i>	17
<i>Peramium decipiens</i>	12
<i>Solidago elongata</i>	1
<i>Petasites speciosa</i>	4
<i>Lupinus</i> spp.	2
<i>Smilacina amplexicaulis</i>	9
<i>Epilobium anderacaulon</i>	1
<i>Melampyrum lineare</i>	8
<i>Viola</i> spp.	13
<i>Viola orbiculata</i>	1
<i>Hieracium</i> spp.	38
<i>Epilobium</i> spp.	2
<i>Antennaria racemosa</i>	4
<i>Galium boreale</i>	9
<i>Tiarella unifoliata</i>	7
<i>Tiarella trifoliata</i>	2
<i>Mittella breweri</i>	6
<i>Streptopus amplexifolius</i>	2
<i>Lysichitum americanum</i>	2
<i>Lithyrus ochroleucus</i>	2
<i>Cirsium</i> spp.	1
<i>Arnica cordifolia</i>	$\frac{1}{2}$
<i>Trifolium</i> spp.	2
<i>Mimulus longsdorfii</i>	1
<i>Mentha canadensis</i>	1

APPENDIX III.

CHECK LIST. (Cont'd.)

Heracleum lanatum	1
Impatiens biflora	1
Cicuta spp.	1
Erigeron acris	1
Lactuca biennis	2
Veronica americana	1
Actea arguta	1
Menyanthes trifoliata	3
Habenaria leucostachys	2
Spiranthea romanzoffiana	2
Eriophorum chamissonis	2
Potentilla palustris	2
Heuchera ovalifolia	2
Cystopteris fragilis	1
Polygonum spp.	1
Achillea spp.	
Valeriana sitchensis	
Arnica latifolia	
Veratrum viride	
Saxifrage spp.	
Pedicularis bracteosa	
Erigeron salsuginosus	
Senecio triangularis	
Gentiana(calycosa)	
Potentilla diversiloba	
Caltha leptosepala	
Trollius laxus	
Artemisia longepedunculata	
Spirea pectinata	
Drosera (rotundifolia)	
Parnassia fimbriata	
Allium cernuum	
Silene acaulis	
Sedum spp.	
Erythromium grandiflorum	
Dryas octopetala	
Geum macrophyllum	
Nymphaea polysepala	
Campanula lasiocarpa	
Prunella vulgaris	
Urtica lyallii	
Typha latifolia	
#154	
#143	
#142	
#187	
Gramineae	
Cyperaceae	

