Society of Am[illegible] Foresters Committee on Nat[illegible] reas

N[illegible]AL AREA NOMINATION FORM

Instructions Complete and forward to Committee along with a sketch type map of the area and a location map (highway map) indicating general location of proposed area Information on past ownership and management scientific or educational use, hydrologic features rare plants or animals or other pertinent facts should be included Please type Photos, if available, will be welcomed

Name of Proposed Natural Area Lake Twenty-two Natural Area

Location State Washington County Snohomish Total Area 790 Acres

Nearest Town and Distance Darrington (Name) 15 (Miles)

Agency/Owner USDA Forest Service

Administrative Unit Mount Baker - Snoqualmie Natioanl Forest
Natl Forest, Natl Park, Wildlife Refuge, State Univ etc

Address 1601 Second Ave Seattle, WA 98101

Permanence Afforded How U-4 (36 CFR 251 23)
Laws, Regulation, Will, Endowment, Letter or Agreement etc

Primary Forest Type

SAF 227 (Type Number) Western Redcedar - Western hemlock (Type Name) 455 (Type Area) Acres

Dominant Trees D B H _____ Hgt _____ Age _____

Other Important Types or Vegetation

	Dominant Trees	Name	D B H	Hgt	Age	Area
SAF Type, Number and Name	226	Pacific silver fir-hemlock				80
	228	Western redcedar				40
	221	red alder				25
		~~brush~~				~~75~~

Barren, Water, Buffer Zone, etc ~~70 & 45~~ Acres rock barren & Lake 22 115
Area and Nature

Description of Vegetation and Other Distinguishing Characteristics "Subalpine" lake and old growth western redcedar - western hemlock forest red alder around lake & in drainages

Elevation 1100-4300 (Range and Average) Feet Topography Steep (Level, Rolling, Steep, etc)

Geology and Soils Sedimentary & metamorphic/podsols & lithosols
Alluvial Volcanic, Moraine Podsol, Serpentine, Etc

Justification Briefly outline why this tract should be designed an SAF natural area

The variety of timber types and the wide range of classes offers an example for comparison with many areas for management purposes Studies of the relationships between plants and animals and the environmental mosaic of the Lake basin will be initiated The area is also habitat for a threatened species, the mountain goat

Submitted by Russell M Burns Title Forest Service RNA Coordinator Date

Mailing Address USDA Forest Service
P O Box 2417
Washington, D C 20013

Approved
Section Natural Area Chairman or
Natural Area Liaison Officer

Approved for Listing in Register of SAF Natural Areas

Chairman,
Committee on Natural Areas Date

Committee on Natural Areas, Society of American Foresters,

5400 Grosvenor Lane, Washington, D C 20014

U-CLASSIFICATION, L-6
NATURAL AREAS - Mt. Baker
South Fork Stillaguamish

February 12, 1940

APR 22 1940
LANDS

all N.F. land. See re-classification memo 5/9/47

REPORT ON LAKE 22 NATURAL AREA

DESCRIPTION

The area consists of 790 acres, more or less, including all of section 22, except the $NW\frac{1}{4}$, $W\frac{1}{2}$ $SW\frac{1}{4}$; also the $W\frac{1}{2}$ $SW\frac{1}{4}$, the $SW\frac{1}{4}$ $NW\frac{1}{4}$, and the $S\frac{1}{2}NW\frac{1}{4}NW\frac{1}{4}$, section 23 and the $NE\frac{1}{4}$, $E\frac{1}{2}$ $NW\frac{1}{4}$, sec. 27, T. 30 N., R. 8 E., W.M. as indicated on the map attached to this report. The actual boundary line established on the ground will tend to follow the ridge tops nearest the legal subdivisions described above. This will include Lake 22, the 22 Creek drainage, and the north slope of Mt. Pilchuck directly south of Lake 22.

It is located adjacent to the South Fork Utilization Road and the South Fork Stillaguamish River and is only 30 miles by good road from the City of Everett.

The area as a whole is a typical virgin forest. There has been no cutting of any kind except for trail bridges, puncheon, and shelters, and the oldest trees give no indication that a forest fire ever visited the tract.

Trees of all ages are present. From one year seedlings of various species up to giant western red cedar trees some nearly 12 feet in diameter. All ages of western hemlock are present and one can easily determine the approximate height and diameter attained by this species on the site represented.

The tract has long been a favorite retreat for numerous outdoor lovers in the Puget Sound vicinity. At one time a modern YMCA camp on the shore of Lake 22, constructed under special use permit, was annually sheltering large numbers of guests. When the Monte Cristo Railway was abandoned the popularity of the camp also dropped and in a few years nature, aided by local vandals, had made a shambles of this once beautiful camp. The debris has since been disposed of by CCC labor.

The only improvement remaining on the area is the excellently located and well constructed trail, some two miles in length, leading from the South Fork Utilization Road to Lake 22. Numerous foot bridges constructed across 22 Creek and located near falls and rapids combine to make this trail our outstanding scenic attraction.

DOMINATE COVER TYPES

Approximately 350 acres are covered with commercial timber stands, 250 acres non-commercial, 80 acres are practically barren, 75 acres are covered with brush, and 35 acres are covered with water and swampy areas.

PHYSICAL AND CLIMATIC CONDITIONS

The topography in general is rugged, rising from 1100 feet on the South Fork Stillaguamish River to 4300 feet on the Pilchuck Ridge. The soil is generally thin to medium depth over hard rock strata. Average annual precipitation is estimated to be 90 inches. The area has a frost free period of 6 months with average annual temperatures ranging from a minimum of 20° to a maximum of 100° F.

FOREST VALUE

SILVICULTURAL TYPES

From the 1000 to the 2000 foot elevations the area is covered with western red cedar (Thuja plicata), western hemlock (Tsuga heterophylla), and amabilis fir (Abies amabilis).

On the river bottom and the lower creekbeds red alder (Alnur rubra), black cottonwood (Populus trichocarpa), and broad leaf maple (Acer macrophyllum) are to be found. Above the 2000 foot level the transition is to the subalpine type consisting of amabilis fir, mountain hemlock (Tsuga mertensiana), and Alaska cedar (Chamaecyparis nootkatensis). Area of rock outcrop are quite numerous. Occasional patches of vine maple (Acer circinatum) and Sitka alder (Alnus sitchensis) are present on the poorer sites. The best site found on the tract naturally occurs on the lower portion where site quality III is found. Site quality rapidly decreases as elevation increases.

TIMBER TYPES

Five distinct timber types are represented on the area, including: (1) mature western hemlock, (2) mature western red cedar, (3) alpine types including, amabilis fir, mountain hemlock, and Alaska cedar, (4) brush and hardwood areas, (5) barren areas.

TIMBER

A considerable amount of merchantable timber is to be found on the area. The following table represents volumes taken from cruise data obtained in 1937, excepting forties number 12 and 13 in section 23, which were taken from 1911 cruise data. This includes all the operable timber of merchantable size included within the tract boundaries.

		Timber in M. ft. B.M.						Poles	Snags	Forest Types (acres)			
Sec	Forty	C	H	A	DC	DnC	Totals	C		C	H3	Hdw	Total
22	1	359	517	196	142	--	1214	15	165	20.5	19.5		40.00
	2	254	428	273	115	17	1087	15	122	16.5	17.5	6.0	40.00
	7	328	185	86	47	2	648	25	42	17.5		2.5	20.00
	8	849	336	113	146	14	1458	45	91	33.5	1.5	5.0	40.00
	9	522	300	113	143	2	1080	90	96	24.43	4.0	10.5	38.93
	10	175	73	25	78	5	356	5	21	10.5			10.50
	16	2	74	74			150	20	35		7.5		7.50
TOTALS		2489	1913	880	671	40	5993	215	572	122.93	50.0	24.0	196.93
23	4	74	544	221	15	4	858		98	1.5	28.5		30.00
	5	388	602	276	83	15	1364	5	116	21.0	19.0		40.00
	12	724	460		16		1200	no data		23.0	17.0		40.00
	13	936	1228	228	48		2440	no data		16.0	24.0		40.00
TOTALS		2122	2834	725	162	19	5862	5	214	61.5	88.5		150.00
GRAND TOTALS		4611	4747	1605	833	59	11855	220	786	184.43	138.5	24.0	346.93

The cedar is practically all decadent old growth suitable for shingle and shake production. On the more favorable sites some good lumber hemlock exists; however, most of the hemlock is of pulpwood quality. The amabilis fir is suitable for the same uses as hemlock. Defect and breakage will be fairly high over most of the area, possibly up to 40% on the cedar and 30% on the hemlock and fir.

WATERSHED PROTECTION

The drainage involved receives considerable snowfall; which amount, definitely controls the year-around stream flow. The forest not only assists in this control but also helps prevent serious soil erosion. This protection is important as the scarcity of soil on the most precipitous areas makes natural reproduction uncertain and growth a particularly slow process.

REPRODUCTION

A characteristic generally noted in the South Fork Stillaguamish watershed is that western hemlock reproduction comes in naturally. This is true also of the tract involved. Other species which are present in substantial quantity are amabilis fir and western red cedar. The area as a whole can be considered one hundred per cent stocked wherever sufficient soil is present.

FIRE DAMAGE

There has been no fire damage to date on the area. Some insect damage has been noted and numerous types of Sporophores, indicating heart rot, are in evidence over the entire tract.

PRACTICABILITY FOR FOREST MANAGEMENT

Only the heavily timbered portion, that area below the 2500 foot contour interval, could be considered as operable timber under management planning procedure. The more remote stands are good only as protection forests.

PRESENT USE OF TIMBER

No timber is being cut on the area, limiting the present timber use to (1) watershed, (2) recreation area, and (3) wildlife area.

AGRICULTURAL VALUE

No agricultural land exists on the area and therefore no such endeavor has been followed nor is anticipated.

GRAZING VALUE

No grazing values exist on the area.

MINERAL VALUE

No minerals are at present being removed from the area. While no patented claims are recorded on the tract, it is not definitely known whether or not any claims have actually been filed within its boundaries. Records to check this point are not readily obtainable. It is quite possible that in the future some development might take place if mineral deposits of value should be located.

OTHER PUBLIC USES

While it would be possible to install a small hydro-electric power plant on 22 Creek, it is not probable that this will materialize as no need for power development is foreseen in this area.

The tract has a moderate recreation value. The trail up 22 Creek and the area around Lake 22 are used by the recreationists in the summer and by the skier in the winter. Lake 22 has been stocked with fish the past two seasons and should provide good fishing in a few years.

TRANSPORTATION FACILITIES

The South Fork Stillaguamish Highway is adjacent to the northeastern boundary of the tract. From this point it is approximately two miles to the Verlot Ranger Station, fourteen miles to Granite Falls, a town of five hundred, and thirty miles to Everett, a city of approximately thirty two thousand persons. Other towns within a thirty mile radius are Snohomish and Arlington.

PUBLIC SENTIMENT

Public sentiment toward setting aside this tract as a Natural Area will no doubt be divided between two factions. The majority, including all the outdoor club members, nature lovers, and recreationists, will without doubt heartily endorse such a move. The minority, including interested timber operators, and local loggers, will be con the fact that considerable fine cedar and a quantity of pulpwood is included within the area's boundary.

Owen L. Aydelott
OWEN L. AYDELOTT
District Ranger

Approved: April 20 1940

[signature]
Acting Forest Supervisor

4-22 40 1940

Lyle F. Watts
Regional Forester

May 2 1940

Stephen N. Wyckoff
Director Northwest Experiment Sta.

Washington, D. C. Jan 14-1947

By virtue of the authority vested in me by Reg. U-4 of the regulations of the Secretary of Agriculture relating to the occupancy, protection and administration of National Forests, I do hereby designate as the Lake 22 Natural Area lands described in the report dated March 29, 1940 by District Ranger, Owen L. Aydelott. Said lands shall hereafter be administered as a Natural Area subject to the provisions of said regulations and the instructions there under.

[signature]
C. M. Granger
Acting Chief, Forest Service

(10)

10. Lake Twentytwo Research Natural Area. Typical specimens of old-growth western redcedar about 2.5 M. d.b.h. growing at lower elevations. FS, Washington

R-6

Large old-growth western redcedar in Lake 22 Research Natural Area, Mt. Baker National Forest, Washington

R-6

No. _____

Name _____

Order _____

Remarks _____

Retouched _____

Order Finished _____

Reorder _____

Reorder _____

LAKE TWENTYTWO RESEARCH NATURAL AREA[1/]

Subalpine lake and old-growth western redcedar-western hemlock forest on a rugged mountain slope in the Northern Cascades of Washington

The Lake Twentytwo Research Natural Area was established on January 14 1947 as a sample of virgin old-growth western redcedar (*Thuja plicata*)-western hemlock (*Tsuga heterophylla*) forest The 320 ha (790 acre) tract is located in Snohomish County Washington and is administered by the Verlot Ranger District (Verlot Washington) Mount Baker National Forest It includes Section 22 (except NW1/4 and W1/2 SW1/4) W1/2 SW1/4 SW1/4 NW1/4 and S1/2 NW1/4 NW1/4 of Section 23 and NE1/4 and E1/2 NW1/4 of Section 27 T 30 N R 8 E Willamette meridian (fig LT-1) It lies at 48 04 N latitude and 121 46 W longitude

Access and Accommodations

Access to the vicinity is via U S Highway 2 and State Highways 9 and 92 from Everett to Granite Falls and Forest Highway 7 to Verlot Ranger Station Beyond the ranger station follow Forest Highway 7 for 2 9 km (1 8 miles) to the start of the Lake Twentytwo Trail

The Lake Twentytwo Trail lies almost entirely within the natural area and traverses a large part of it The trail climbs for 4 km (2 5 miles) and 425 m (1 400 ft) of elevation to its terminus at the lake There are no other trails or roads within the natural area boundary and cross-country access to that part of the tract east of Twentytwo Creek and Twentytwo Lake is difficult

The nearest commercial overnight accommodations are in Everett about 40 km (25 miles) away although food can be obtained at Verlot and Granite Falls There are seven public campgrounds with 3 to 8 km (2 to 5 miles) of the natural area

Environment

The Lake Twentytwo Research Natural Area occupies essentially the entire drainage of Lake Twentytwo Creek except for some of the rugged cliffs and rock ridges south and west of Lake Twentytwo Elevations range from about 335 m (1 100 ft) above sea level near the South Fork of the Stillaguamish River to about 1 100 m (3 600 ft) on the ridges southeast and west of Lake Twentytwo Topography is steep to very steep and broken a few small benches are present

Lake Twentytwo lies entirely within the natural area It is a 17 9 ha (44 1 acre) lake with a maximum measured depth of 16 m (53 ft) (Wolcott 1961) The lake was created by glacial activity Despite its location at a relatively low elevation of 750 m (2 460 ft) the lake and its environs have many aspects of a much higher subalpine lake permanent snowfields are found within the lake basin (fig LT-2)

1/ Description prepared by Dr J F Franklin U S Forest Service Forestry Sciences Laboratory Corvallis Oregon

The natural area is located on two major geologic formations (Huntting et al 1961) Rocks in the upper part of the natural area are granitic intrusive rocks of Tertiary-Cretaceous age while those at lower elevation are upper Jurassic-lower Cretaceous sedimentary rocks The cirque basin in which Lake Twentytwo is located as well as the lake itself are obviously glacial features which originated during the Pleistocene

The natural area is subject to a wet cool maritime climate Annual precipitation is heavy and highly seasonal although rain is not uncommon during the summer months Summers are cool This regional cool wet climate is of course accentuated on the steep north slope occupied by the natural area Climatic data from the nearest weather bureau station--Darrington Washington about 24 km (15 miles) northeast--are as follows (U S Weather Bureau 1956 1965) They probably provide an approximation of climatic conditions encountered at lower elevations in Lake Twentytwo Research Natural Area

Mean annual temperature	9 6 C (49 4 F)
Mean January temperature	1 1 C (33 9 F)
Mean July temperature	17 4 C (63 3 F)
Mean January minimum temperature	-3 2 C (26 1 F)
Mean July maximum temperature	25 9 C (78 7 F)
Average annual precipitation	2 045 mm (80 51 in)
June through August precipitation	155 mm (6 06 in)
Average annual snowfall	120 cm (47 4 in)

Soils on the natural area have not been mapped or described Podzols Brown Podzols and Lithosols types were noted during reconnaissance of the area

Biota

A gross estimate of areas by S A F forest types (Society of American Foresters 1954) is as follows

No	Name	Area
227	Western redcedar-western hemlock	184 ha (455 acres)
226	Pacific silver fir-hemlock	32 ha (80 acres)
228	Western redcedar	16 ha (40 acres)
221	Red alder	10 ha (25 acres)

Much of the acreage of Pacific silver fir-hemlock type is composed of small patches and stringers of trees In addition to the areas classed as forest there are approximately 30 ha (75 acres) of brushfields 28 ha (70 acres) of barrens --cliffs meadows and talus--and 18 ha (45 acres) of water within the natural area Küchler s (1961) Types 2 (Cedar-Hemlock-Douglas Fir Forest) 3 (Silver Fir-Douglas Fir Forest) 4 (Fir-Hemlock Forest) 25 (Alder-Ash Forest) and 52 (Alpine Meadows and Barren) are represented within Lake Twentytwo Research Natural Area The natural area spans both the *Tsuga heterophylla* and *Abies amabilis* Zones of Franklin and Dyrness (1969) and includes many elements of the *Tsuga mertensiana* Zone in the lake basin

The lower forests in the natural area are old-growth stands of western hemlock and western redcedar Some Pacific silver fir (*Abies amabilis*) are present as well as an occasional Sitka spruce (*Picea sitchensis*) at lowest elevations The largest trees are the redcedar which average 1 5 to 2 5 m (5 to 8 ft) in diameter (fig LT-2) with a maximum of nearly 3 7 m (12 ft) d b h Hemlocks of all ages and sizes up to 130 cm (50 in) d b h are present Western hemlock appears to be the climax species as reproduction of western redcedar is generally absent and that of Pacific silver fir is sporadic at low elevations The understory can be typified by *Vaccinium alaskaense* and *ovalifolium Menziesia ferruginea Blechnum spicant Cornus canadensis Rubus pedatus Spaghnum girgensohnii* and *Hylocomium splendens* In wetter locations e g along streams *Oplopanax horridum Athyrium filix-femina Rubus spectabilis Tolmeia menziesii Ribes bracteosum* and *Boykinia major* are conspicuous

Forests at higher elevations are characterized by Pacific silver fir mountain hemlock (*Tsuga mertensiana*) and Alaska-cedar (*Chamaecyparis nootkatensis*) In older stands the trees average 75 to 100 cm (30 to 40 in) d b h The climax species appears to be silver fir as reproduction of the others is sparse A dense layer of shrubs is usually present including *Vaccinium alaskaense* and *ovalifolium Menziesia ferruginea Rubus spectabilis* and *Cladothamnus pyrolaeflorus* Dominant herbs are *Streptopus curvipes Rubus pedatus Blechnum spicant* and *Maianthemum bifolium* var *kamschaticum*

Another major group of communities is brushfield stands which vary in character depending on local moisture and temperature conditions One type conspicuous along the Lake Twentytwo Trail is dominated by *Acer circinatum* it is found on scree slopes Many other shrubs are present such as *Rubus spectabilis Alnus sinuata Sambucus* sp *Ribes lacustre* and *Oplopanax horridum* The rich herb layer usually includes *Athyrium filix-femina Pteridium aquilinum Crpytogamma acrostichoides Montia* spp *Aruncus sylvester Galium* sp and *Tolmeia menziesii* A part of one *Acer circinatum*-dominated brushfield includes a small stand of bigleaf maple (*Acer macrophyllum*) 20 to 25 cm (8 to 10 in) d b h (fig LT-2)

The cirque basin occupied by Lake Twentytwo is a mosaic of habitats and communities mostly nonforested (fig LT-2) Habitats include wet rocky cliffs margins of permanent snowpatches boulder fields scree slopes and alluvial deposits along the lake shore all are supplied with abundant moisture The communities include a variety of dense herbaceous stands dominanted by species such as *Polygonum bistortoides Athyrium americanum Carex* spp *Veratrum viride Valeriana sitchensis* and *Caltha* sp dense shrub fields dominated by *Vaccinium ovalifolium* and *alaskaense Menziesia ferruginea Sorbus* sp and *Cladothamnus pyrolaeflorus* and patches of mostly small Pacific silver fir mountain hemlock and Alaska-cedar Most communities have a distinctly subalpine aspect despite the 760 m (2 500 ft) elevation *Phyllodoce empetriformis* and *Luetkea pectinata* timberline species are found along the lakeshore

A variety of fauna inhabit the natural area including the blacktail deer (*Odocoileus hemonus columbianus*) black bear (*Ursus americanus*) pika (*Ochotona princeps*) Douglas-squirrel (*Tamasciurus douglasii*) and occasionally the mountain goat (*Oreamnos americanus*) Fish were planted in Lake Twentytwo over 30 years ago Wolcott (1961) indicates rainbow trout were planted in 1951

The specialized terrestrial habitats have already been mentioned e g the cliffs snowpatches and scree slopes of the lake basin There is also the lake itself and the entire length of Twentytwo Creek (fig LT-2)

History of Disturbance

The Lake Twentytwo area has a long history of public use and human disturbance is evident in a few locations At one time there was a YMCA camp on the shore of the lake it was abandoned and the debris removed prior to establishment of the natural area The original trail to the lake closely followed the creek It was abandoned when the present trail was completed but is still evident in some locations At present the most obviously disturbed areas are around the lake especially at the north end where campers hikers and fishermen have created bare openings and a system of trails Recreational use of the trail and lake margins is heavy and continuing

There is no evidence of wildfire within the na ural area and none have been recorded within historic times

Research

No research is presently being conducted within the natural area Some unique research opportunities would include (1) comparison of the forests of Lake Twentytwo Research Natural Area with those on the south-facing Long Creek Research Natural Area 3 km (2 miles) away and (2) study of the relationships between plant and animal communities and the environmental mosaic within the Lake Twentytwo basin

Maps and Aerial Photographs

Special maps applicable to the natural area include topography--15 Granite Falls Washington quadrangle scale 1 62 500 issued by the U S Geological Survey in 1956 and geology--Geologic Map of Washington scale 1 500 000 (Huntting Bennett Livingston et al 1961) Either the District Ranger (Verlot Ranger District) or Forest Supervisor (Mount Baker National Forest Bellingham Washington) can provide details on the most recent aerial photo coverage and forest type maps for the area

Literature Cited

Franklin Jerry F and Dyrness C T
1969 Vegetation of Oregon and Washington Pacific Northwest Forest and Range Exp Sta USDA Forest Serv Res Pap PNW-80 216 p illus

Huntting Marshall T Bennett W A G Livingston Vaughan E Jr and Moen Wayne S
1961 Geologic map of Washington Wash Dep Conserv Div Mines & Geol

Kuchler A W
1964 Manual to accompany the map of potential natural vegetation of the conterminous United States Amer Geogr Soc Spec Publ 36 various paging illus

Society of American Foresters
1954 Forest cover types of North America (exclusive of Mexico) 67 p illus Washington D C Soc Amer Foresters

U S Weather Bureau
1956 Climatic summary of the United States--supplement for 1931 through 1952 Washington Climatography of the United States 11-39 79 p illus

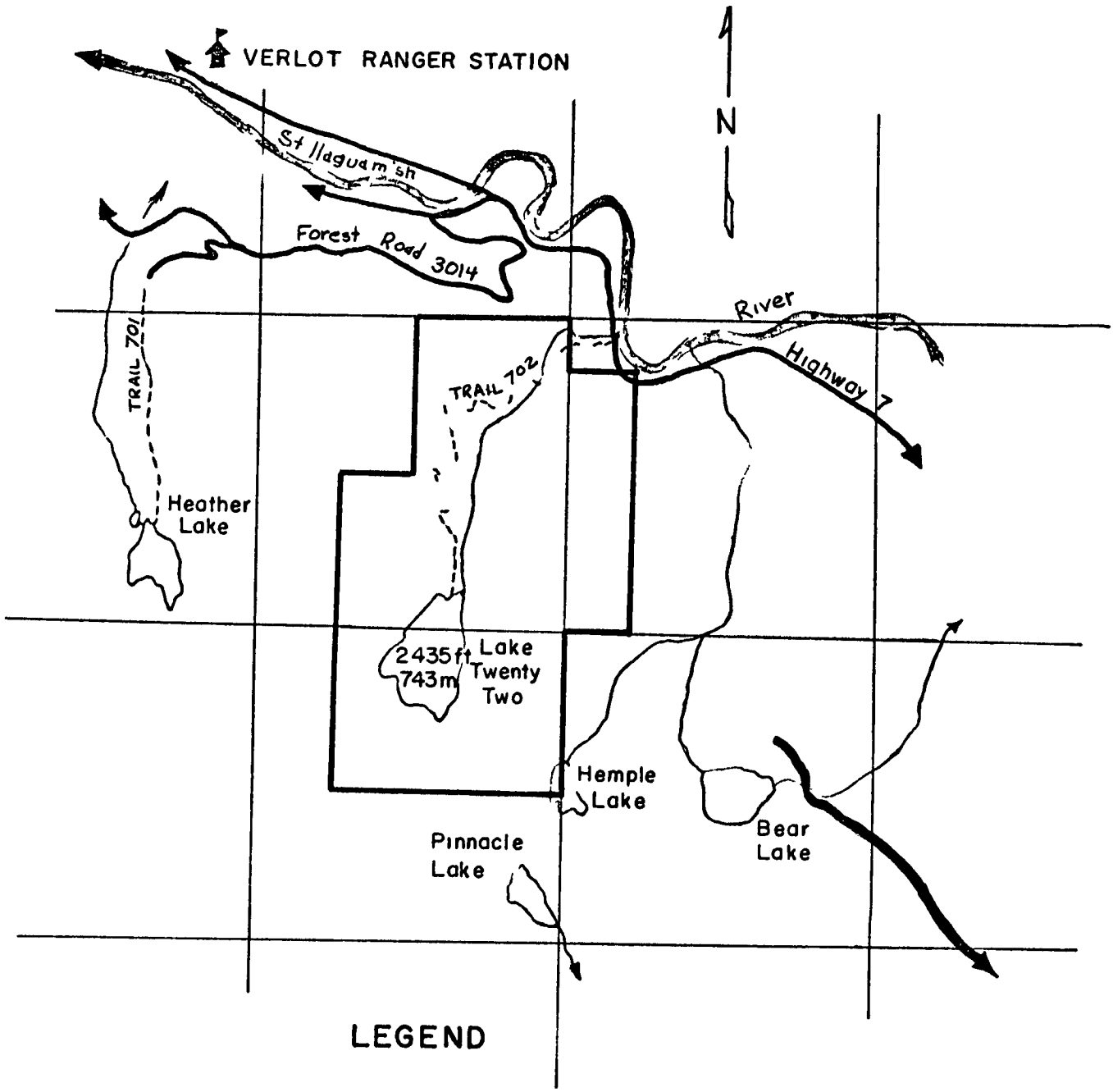
U S Weather Bureau
1965 Climatic summary of the United States--supplement for 1951 through 1960 Washington Climatography of the United States 86-39 92 p illus

Wolcott Ernest E
1961 Lakes of Washington Volume 1 Western Washington Wash State Dept Conserv Div Water Resources Water Supply Bull 14 619 p illus

Figure Captions

Figure LT-1 --Lake Twentytwo Research Natural Area Snohomish County Washington (approximate scale 2 in equals 1 mile)

Figure LT-2 --Natural features of the Lake Twentytwo Research Natural Area Upper left Typical specimens of old-growth western redcedar about 2 5 m d b h growing at lower elevations Upper right Lake Twentytwo Creek which is included almost entirely within the natural area Lower left Small stand of bigleaf maple (background) which average 20 to 25 cm d b h and *Acer circinatum* community (foreground) which dominates extensive areas of brushfields growing on talus Lower right A portion of Lake Twentytwo and the surrounding basin note the persistent snowbanks in this later summer photograph



LEGEND

BOUNDARY LAKE TWENTY TWO RESEARCH NATURAL AREA

SECTION LINE

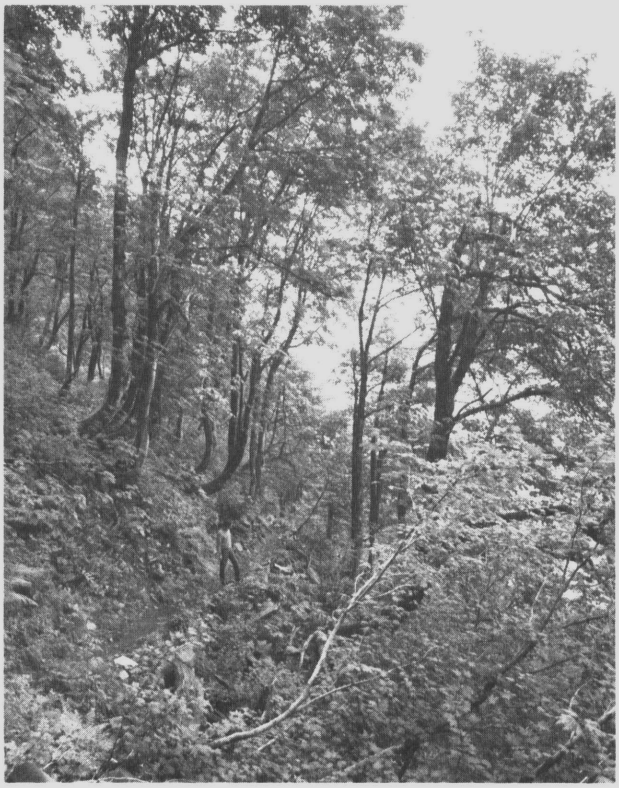
STREAM

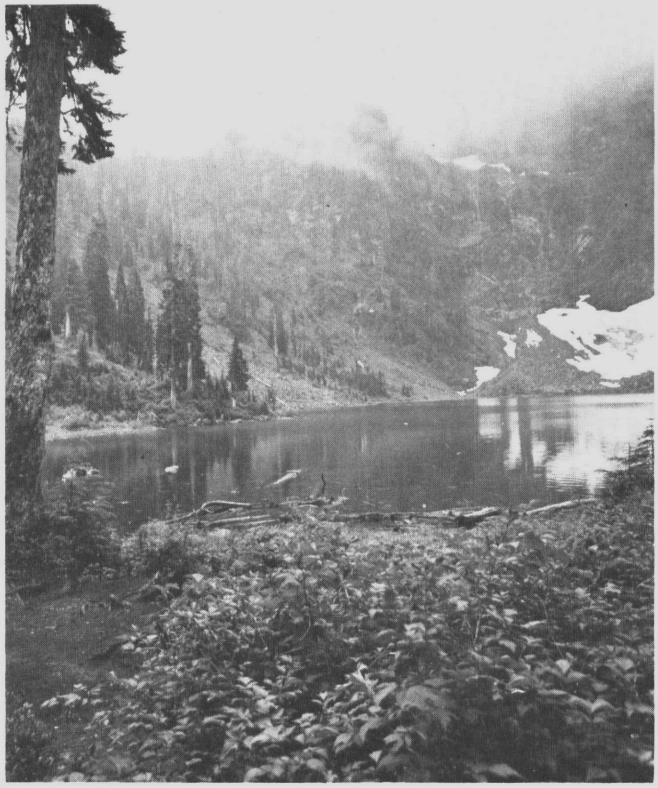
ROAD

TRAIL

0 1/4 1/2 1 Mi

0 1/4 1/2 1 Km





INTERNATIONAL BIOLOGICAL PROGRAMME

SECTION CT CONSERVATION OF TERRESTRIAL BIOLOGICAL COMMUNITIES

CHECK SHEET (Mark VII) FOR SURVEY OF IBP AREAS

To be completed with reference to the GUIDE TO THE CHECK SHEET

Serial Number

For Data Centre Use only

1 1 Name of surveyor Jerry F Franklin

2 Address of surveyor FORESTRY SCIENCES LABORATORY
PACIFIC NW FOREST & RANGE
EXPERIMENT STATION
3200 JEFFERSON WAY
CORVALLIS OREGON

3 Check Sheet completed (a) on site ✓ (b) from records ✓

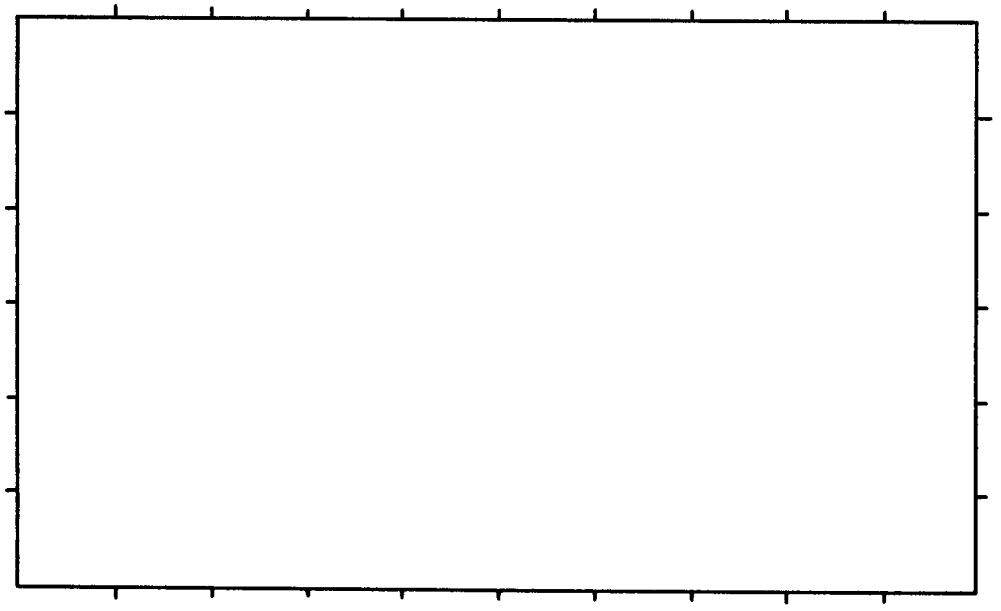
4 Date Check Sheet completed FEBRUARY 15, 1970

2 1 Name of IBP Area LAKE TWENTYTWO RESEARCH NATURAL AREA

2 Name of IBP Subdivision (or serial letter)

3 Map of IBP Area* showing boundaries attached? Yes ✓ No

4 Sketch map of IBP Area* Please mark direction of north the scale and grid numbers where applicable



* For IBP Area read IBP Area and/or IBP Subdivision

For Data Centre Use only

3 **Location of IBP Area***

1 Latitude 48 04' N/S Longitude 121 ° 46' E/W

2 Country UNITED STATES OF AMERICA

State or Province WASHINGTON County SNOHOMISH

(State or Province County)

4 **Administration**

National 1 Official category FEDERAL RESEARCH NATURAL AREA

2 Address of administration

Pacific Northwest Forest &
Range Experiment Station
P O. Box 3141
Portland Oregon 97208

International Class

3

Included in UN List	Rejected from UN List	Area with formal conservation status	No formal cons status
(A)	(B)	(C) ✓	(D)

5 **Characteristics of IBP Area***

1 Surface area (state units of measurement) 320 HA

2 Altitude (state units of measurement) Maximum 1,100 M.

Minimum 335 M

6 **Climate**

Nearest climatological station

1 Name DARRINGTON, WASHINGTON

2 Climatological station on IBP Area*? Yes No ✓

3 If (2) not distance from edge of IBP Area* (state units) 25 KM

4 Direction from IBP Area* NORTHEAST

5 Additional data sheet attached? Yes ✓ No

For Data Centre Use only

7 **Vegetation and Soil**

1 **Vegetation**

Community Reference Number	Vegetation Code: Primary Structural Group	Class	Group	Formation	Sub Formation	Plant communities (give usual name using full Latin names of a species where applicable)	Area (state units) NA	
1	1	A	1	7a	e	Thuja plicata - Tsuga heterophylla / ~~Oplopanax horridum~~ Vaccinium spp	184 X 247	455 acres
2	1	A	1	7a	e	Abies amabilis / Vaccinium ovalifolium	32	- 79
3	1	A	1	7a	e	Thuja plicata / Oplopanax horridum	16	40
4	1	B	2	1a	e	Alnus sinuata / Rubus spectabilis	10	25
5	1	B	2	1a	e	Acer circinatum / Pteridium aquilinum	30	74
6						Subalpine meadow & cliff communities	28	69
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Please give information about further communities on a separate sheet

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7 (cont) 2

Soil

Community Reference Number	Soil type	Other notes
1	F_5	BROWN PODZOLICS
2	F_5	PODZOLICS
3	F_5	BROWN PODZOLICS WITH SOME GLEYING
4	I_2	
5	I_2	
6	I_2-I_3	
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

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8 **Similar Communities in Country (or State)**

Community Reference Number	Protected					Protected and Unprotected				
	Abundant	Infrequent	None known	Decreasing	Increasing	Abundant	Infrequent	None known	Decreasing	Increasing
1		✓				✓			✓	
2		✓				✓			✓	
3			✓				✓		✓	
4		✓				✓				
5		✓				✓				
6		✓				✓				
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

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9 **Landscape**

1 General Landscape (give brief description) DRAINAGE ON NORTH SLOPE OF VERY RUGGED MOUNTAIN RIDGE VERY STEEP SLOPES, MANY CLIFFS AND ROCK OUTCROPS

2 Relief Type

	Flat	Undulating (0) 200 m	Hilly 200 1000 m	Mountainous > 1000 m	/
Sharply dissected			100		100
Gently dissected					
Incised					
Skeletonised					
/			100		100 /

3 Special landscape features (list)

10 **Coastline of IBP Area*** NONE

1 Protected bays and/or inlets Many [ ] Few [ ] None [ ]

2 Substratum / of coast

Rock	Boulder Beach	Shingle Beach	Sand Beach	Shell Beach	Mud	Coral	Ice

3 Physiography / of coast

Cliffed	Sloping	Flat

4 Special Coastal Features (list)

5 Tide Maximum range (state units of measurement)

6 Total length of coastline

Less than 1 km [ ] 1 10 km [ ] Above 10 km [ ]

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11 **Freshwater within IBP Area***

1

	Permanent	Intermittent
General		
Standing	✓	
Running	✓	

2 Standing Water

	Permanent	Intermittent	Unproductive	Productive
Swamps				
Ponds				
Lakes	✓		✓	

3 Running Water

	Permanent	Intermittent
Springs cold	✓	
Springs hot		
Streams	✓	
Rivers		

4 Special freshwater features

12 **Salt and Brackish Water within IBP Area*** NONE

Salt Lakes		Lagoon		
Estuaries		Salt pools		

13 **Adjacent Water Bodies (not within IBP Area*)**

1 Fresh [ ] Lake [✓] River [✓] Stream [✓]

2 Salt and Brackish

Estuary	Salt lake	Salt pool	Lagoon	Ocean		

15 **Exceptional Interest of IBP Area*** List items and salient facts (e g botanical ornithological teaching area site of classic research since 1930)

16(1) **Significant Human Impact General** Check one line

(2) **Particular** types of significant human impact Types of human impact additional to the 16 types listed should be entered in the vacant rows Where the impact does not operate today but has operated in the past check past Where it does operate now but did not operate before 1900 check Present only Where a present day impact operated before 1900 check both past and present For all types of present impact check off the trend Only check increasing or decreasing if this is certain otherwise check no certain change

(3) **Additional details on each type of impact attached? Yes/No** Check

17 **Conservation Status** Refers to human influence on material objects within the IBP Area* This influence may be partial in space time or manner

Protection (from exploitation) Refers to current legal position regarding deleterious influence of man If practice falls significantly short of theory this fact should be noted in 19

Utilisation Restrained exploitation to take a long term crop The extent and period of utilisation may be legally limited (Controlled) or not (Uncontrolled)

Conservation Management Utilisation with the primary object of maintaining restoring or creating an ecosystem which has some special interest to biologists Status refers to bio logical status which may be equated with vegetation type for the purposes of this survey

Permitted Research Observational research does not interfere with the ecosystem Ex perimental research usually involves interference of some sort

18(1) **List major biological/geographical references for the IBP Area*** Attach list and check

(2) **List main maps available for the IBP Area*** Attach list and check

(3) **Aerial photographs for the IBP Area* available?** Check one space

19 **Other relevant information** Can also be used when there is insufficient space for the answer to another question

Additional Information

In a number of sections surveyors are asked to attach additional information when this is available on separate sheets These sections are

2(4) Map of IBP Area*

6(5) Climatological Data

16(3) Significant Human Impact Explanatory notes

18(1) Major biological/geographical references

(2) List of main maps available

Data Centre

Completed Check Sheets should be returned to the national organiser or direct to the Data Centre whose address is

IBP/CT Survey
Biological Records Centre
The Nature Conservancy
Monks Wood Experimental Station
Abbots Ripton
Huntingdon England

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14 **Outstanding Floral and Faunal Features**

1 None

2 Fauna

	Species diversity	Abundance of individuals	Superabundance of individuals	Rare species	Threatened/Relict species	Spp of biogeographical interest	Exceptional Associations	Breeding or Nesting Populations	Migrating Populations	Wintering Populations		
Mammalia				✓								
Aves												
Reptilia												
Amphibia												
Pisces												
Insecta												

3 Names of main threatened endemic relict and rare species

OREAMNOS AMERICANUS (MOUNTAIN GOAT)

Sloping Cliffed coastlines in which no part is inaccessible to land animals

Flat Coastlines which lack cliffs and sloping cliffs

(4) **Special coastal features** should be listed accordingly to widely terms (e g reefs sand bars)

(5) **Tide Maximum Range** State units

(6) **Total length of coastline** Check appropriate value

11 **Freshwater within IBP Area***

(1) (2) and (3) Check in the spaces the features which are present Surveyors may insert indications of abundance e g many few etc provided it is clear which features are present and which absent

Definitions

General	All types of freshwater
Standing	Water not flowing continuously in a definite direction
Running	Water flowing in a definite direction
Swamp	A lake pond or other site of such small depth that it is occupied ± com pletely by emergent vegetation
Pond	A body of standing water whose area of open water is less than 10 000 m^2
Lake	A body of standing water whose area of open water is greater than 10 000 m^2
Spring	A site at which water is issuing through a natural opening in such quantity as to form an appreciable current A hot spring has an average temperature more than 10 C above the yearly mean for the surrounding air
Stream	A watercourse or part of a watercourse whose mean width is less than 5 m
River	A watercourse or part of a watercourse whose mean width is greater than 5 m
Permanent	Never or very rarely disappears All other situations are regarded as Inter mittent
Productive	Eutrophic waters and those with relatively high biological productivity which are morphometrically oligotrophic
Unproductive	Other oligotrophic waters and those of relatively low biological productivity

(4) **Special freshwater features** should be listed according to widely known terms (e g rapids geysers seasonally inundated land)

12 **Salt and Brackish Water within IBP Area*** Check

13 **Adjacent water bodies** i e those whose margins form part or all of the boundary of the IBP Area* which are therefore not within the IBP Area*

Definitions as follows

Freshwater	Salinity generally within the range 15 300 p p m
Salt and Brackish water	Salinity above the normal range of freshwater
Ocean	Should only be used for the interconnected oceans
Salt Lake	A body of standing salt water whose area of open water is greater than 10 000 m^2
Salt Pool	A body of standing salt or brackish water whose area of open water is less than 10 000 m^2
Lagoon	Shallow lake formed in association with coral
Estuary	Tid l portion of a river mouth

14(1) **Outstanding Floral and Faunal Features** Check if none known

(2) and (4) Only the presence of outstanding features should be noted by checking the appropriate box No other information is required here we do not want for example the number of bird species present inserted under Aves — species diversity because this is not in itself an indication that this number is outstanding Columns have been left vacant for additional types of outstanding feature and additional taxonomic groups may be added in the vacant rows The vacant rows may also be used to give more precise data for the groups listed e g if the outstanding interest centres on the Carnivora of the Mammalia Carnivora may be inserted in a vacant row Always designate taxonomic groups by their Latin name

(3) and (5) **Names of main threatened endemic, relict and rare species** List the species by their Latin names Vernacular names in addition are welcome but not obligatory

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4 Flora

	Species diversity	Abundance of particular species	Rare species	Threatened/relict species	Spp of biogeographical interest	Exceptional associations	Outstanding specimens				
Angiospermae											
trees											
shrubs			✓		✓						
herbs			✓		✓						
grass											
Gymnospermae		✓					✓				
Pteridophyta											
Bryophyta											
Lichens and Algae											

5 Names of main threatened endemic relict and rare species

SEVERAL SUBALPINE SHRUBS & HERBS AT LOWER EDGE OF RANGE AND/OR RARE E G, CLADOTHAMNUS PYROLAEFLORUS

15 Exceptional Interest of IBP Area*

EXCELLENT, UNDISTURBED, OLD THUJA PLICATA STANDS WITH AND WITHOUT TSUGA HETEROPHYLLA; "SUBALPINE" LAKE (BIOLOGICALLY) AT 750 M. ELEVATION

7(2) **Soil**

Soil Type Enter the code number for the soil type which occurs under each Community These can be identified in Appendix 2 Where more than one soil type occurs under one Community either the definition of the Community should be revised or an explanatory note should be added under Other notes

Other Notes Sub types present should be mentioned together with short descriptions of significant features e g colour humus content depth

8 **Similar Communities in Country (or State)**

This Section will normally refer to the entire Country but in the case of large countries (Australia Brazil Canada China India U S A U S S R) it should refer to states or provinces (primary administrative subdivisions) All Communities should be considered here — in exactly the same order as in 7 using the Community Reference Number for cross reference

Insert up to four checks in each row

Protected refers to sites of A B and C (see 4(3) above)

Protected and Unprotected refers to all sites within the Country (or State)

None known The Community does not occur elsewhere in the country/state

Infrequent Other examples of the Community exist in the country/state but the loss of any one of them would be a grave depletion of its type

Abundant Other examples of the Community are sufficiently common and widespread that the loss of any one of them would not be a significant depletion of its type

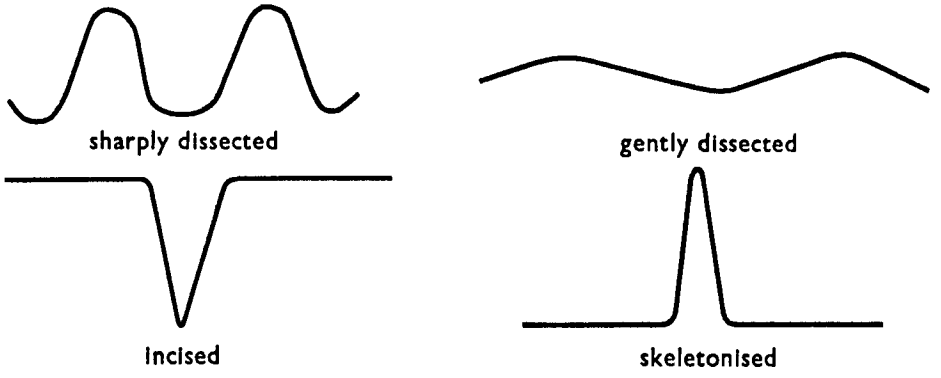
Decreasing/Increasing Insert a check only when the change observed appears to be leading to a permanent change in the status of the Community

9(1) **General Landscape** Describe in less than 50 words Confine description to geomorphological features It is permissible to consider land outside the IBP Area (see Part 3)

(2) **Relief Type** Check off type(s) present It is possible to consider land outside the IBP Area* (see Part 3)

Altitudinal range divided into four classes of which the lowest is flat in which there is very little variation in altitude

Erosion Types may be illustrated as follows



(3) **Special Landscape Features** should be listed according to widely known terms (e g cliff ice fields dunes recent vulcanism) Interpret special liberally

10(1) **Protected Bays and Inlets Many/Few/None** Check

(2) **Substratum** Insert approximate percentage value for the length of coast occupied by each type of substratum It is possible for the total to exceed 100 / Definitions are as follows

Rock Fixed stable unweathered rock

Beach Mobile or potentially mobile material of which the particle size ranges from very large (boulder) to minute (mud)

(3) **Physiography** Insert approximate percentage value for the length of coast occupied by each type These values should total 100 /

Definitions are as follows

Cliffed Wholly or partially vertical with at least some part inaccessible to land animals

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16 **Significant Human Impact**

1 General None in entire IBP Area

None in part of IBP Area ✓

Impact on entire IBP Area*

2 Particular

	Past impact	Present impact	Trend			
			Increasing	Decreasing	No change	No information
Cultivation						
Drainage						
Other soil disturbance						
Grazing						
Selective flora disturbance						
Logging						
Plantation						
Hunting	✓	✓				✓
Removal of predators						
Pesticides						
Introductions — plants						
Introductions — animals						
Fire						
Permanent habitation	✓			✓		
Recreation and tourism	✓	✓	✓			
Research						
Fishing	✓	✓	✓			

3 Additional details on each type of impact attached?

Yes ✓ No

(2) **Name of IBP Subdivision** To be used only when the IBP Area is divided into two or more IBP Subdivisions IBP Subdivisions for which there is no suitable name should be given a reference letter (a b c etc) thus distinguishing them from other IBP Subdivisions in the same IBP Area **This question should only be left blank if the Check Sheet refers to an IBP Area**

(3) **Map of IBP Area* showing boundaries attached?** Yes/No Check

(4) **Sketch map of IBP Area*** This should show

— the shape of the IBP Area

— its relation to compass directions

— boundaries common with the boundary of the IBP Area (for IBP Subdivisions only)

— major features of the land form and vegetation (e g peaks rivers woods etc)

— sites of field stations and other permanent habitations

3(1) **Latitude and Long tude** Delete the N or S E or W which does not apply

(2) **Country State or Province County** Insert names of administrative areas in which the IBP Area* is situated The following levels are recognised

— National or Territorial embracing the whole contiguous area under one political sovereignty **(Country)**

— Regional or Provincial units intermediate between national and local levels **(State or Province)**

— Local e g **county** parish commune gemeinde etc

Spaces are provided for IBP Areas* which overlap Province or County boundaries

4(1) **National Category** e g National Park Strict Nature Reserve etc

(2) **Address of Administration** responsible for the IBP Area* Full postal address

(3) **International Class** The following four classes have been adopted Check under the appropriate class

Class A Included in U N List

Class B Considered for inclusion in U N List but rejected These sites are mentioned in Chapter V of the U N List

Class C Other sites at present protected

Class D Unprotected sites of interest to conservationists and biologists

5(1) **Surface area** may be inserted in any units but please state units

(2) **Altitude Maximum and Minimum** Please state units used

6(1) **Name of Nearest Climatological Station** As used in publications of national climatological organisations

(2) **Climatological Station on IBP Area* Yes/No** Check

(3) **Distance from edge of IBP Area* if outside** State units

(4) **Direction from IBP Area*** Insert compass direction from centre of IBP Area* Use 16 point compass notation (N NNE NE NNW) or degrees (0 10 350)

(5) **Additional data sheet attached? Yes/No** Check

7(1) **Vegetation**

Plant Communities List these by their usual names using Latin names for all species mentioned Space is provided for 20 Communities further Communities should be listed on a separate sheet There is no restriction on the methods by which Communities may be defined so long as the Communities so formed can be easily recognised by local scientists Community Reference Numbers are provided to facilitate cross reference between 7(1) 7(2) and 8

Vegetation Code The Formation (and sub formation) to which each Community belongs should be entered These Formations (and sub formations) may be identified in Appendix 1 A key is provided to facilitate identification Enter only the code numbers for each Forma tion (and sub formation) placing one digit in each square

Area of each Community should be entered to maximum available accuracy

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17 **Conservation Status**

	Protection			Utilisation			Conservation Management			Permitted Research		
	none	partial	total	none	controlled	uncontrolled	none	to alter status	to maintain status	experimental	observational	prohibited
Flora			✓	✓	✓				✓		✓	
Fauna		✓		✓	✓		✓				✓	
Non living			✓	✓	✓				✓		✓	

18 **References**

1 List major biological/geographical references for the IBP Area

Sheet attached? Yes ✓ No

2 List main maps available for the IBP Area

List attached? Yes ✓ No

3 Aerial photographs for the IBP Area available?

For whole area ✓ For part of area None

19 **Other Relevant Information**

Signed Jerry F Franklin (Surveyor)

GUIDE TO THE CHECK SHEET

by G F Peterken

PART FOUR

FIELD INSTRUCTIONS

This part is designed to assist the surveyor to fill in the Check Sheet and thereby facilitate the task of the Data Centre in transferring the contents of each Check Sheet to the computer tape It contains all definitions and instructions necessary for completing the Check Sheet except the classi fications of plant formations and soils which are presented in Appendices 1 and 2 respectively Together with these appendices it can be used in isolation from the remainder of the Guide and is therefore suitable for translation in those countries where it is not possible to translate the entire Guide Previous parts explain the purpose and objectives of the survey (Part 1) the selection of sites (Part 2) and the meaning and purpose of each question on the Check Sheet (Part 3) Following this part are four appendices dealing with the classification of Plant Formations classification of soils the Geocode and an example of a completed Check Sheet

Incomplete Information

It is likely that for many IBP Areas* the surveyor will not have enough information to complete every question To a limited extent this does not matter for even incomplete returns will contain valuable information Nevertheless there is a minimum number of sections which must be com pleted before a returned Check Sheet can be accepted as adequate **Sections 1 2 3 4 5 and 7(1) must be completed before it is worth sending in a Check Sheet to the Data Centre**

A returned Check Sheet containing only the bare minimum of information will possess only limited worth In practice it is expected that for most IBP Areas much more information will be available any ecologist reasonably familiar with an IBP Area* should have no difficulty in answering Sections 6 7(2) 9 10 11 12 and 13 in addition to those listed above The remaining Sections — 8 14 15 16 17 and 18 — ask for more detailed information which may not be readily available Since these later sections largely correspond with the conservation content of the Check Sheet it i hoped that surveyors will make every effort to obtain the additional information necessary to com plete the Check Sheet As the number of unanswered questions increases so does the value of the survey decrease

IBP Area and IBP Subdivision

IBP Area An IBP Area is a site of class A B C or D as defined below under 4(3)

IBP Subdivision An IBP Subdivision is part of an IBP Area It is an area variable in extent which is of interest to conservationists and biologists and which is of such size and uniformity that its features can be meaningfully set out on a single Check Sheet

Notes on Sections

In the paragraphs below the numbers correspond with the section (question) numbers on the Check Sheet

General rules

(a) Where quantitative information is requested (e g area) this should be given as accurately as possible Estimates are acceptable in the absence of accurate values

(b) In general only positive statements should be made (i e **presence** of a particular feature) but when a feature is known **with certainty** to be absent this may be stated

1(1) **Name of surveyor**

(2) **Address of surveyor**

(3) **Check Sheet completed on site/from records** Check (i e ✓) one or both as applicable

(4) **Date Check Sheet completed**

2(1) **Name of IBP Area** If the IBP Area is Class A B or C (see 4(3) below) insert the name as it appears in the U N List (A and B) or in national lists of protected sites (B and C) For Class D IBP Areas insert the name by which the IBP Area is generally known If the U N List is not available for Classes A and B fill in the name by which the IBP Area is generally known

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N B IBP Areas and IBP Subdivisions

NATUR L AREA INFORMATION FORM

1 Name of Natura Area Lake 22 Natural Area ✓

2 Administering Agency U S Forest Service ✓

3 Supervising Field Unit Mount Baker National Forest ✓

4 S ate and County Washington Snohomish County ✓

5 Latitude and Longitude 121° 35' 48° 04'
(This information will not be given to the general public)

6 Primary type on areas SAF 227 ~~435~~ 323 Acres

see RNA write-up

7 Other important types represented on area

7a Botanic K-52 – 210 Acres SAF-226 ~~80~~ 150 Acres

7b Zoologic

7c Geologic

7d Aquatic

8 Acreage 790 Acres ✓

9 Elevation and Topography Max 4 300' Min ~~10'~~ 1,100'
Steep and broken

10 For information contact Director
PNW Forest Experiment Station
6th Ave
P O Box 3141
Portland Oregon 97208

This form should be filled out in accordance with the instructions on the accompanying information sheet