

BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

HAT CREEK PROJECT

Tera Environmental Resource Analyst Ltd. and Canadian Bio-Resources
Consultants Ltd. - Hat Creek Project - Detailed Environmental Studies -
Physical Habitat and Range Vegetation Report - (d) Map Envelope.

ENVIRONMENTAL IMPACT STATEMENT REFERENCE NUMBER: 16 d

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HAT CREEK PROJECT DETAILED ENVIRONMENTAL STUDIES

MAP 4-2 LAND SYSTEM ANALYSIS

LANDFORM

- Up Upland 0 - 30%
- B Bottomland 0 - 30%
- St Steepland 30%+

GEOLOGY

- T Till
- A Alluvium
- C Colluvium
- F Glacialfluvial
- R Rock
- (V) Volcanic and Sedimentary Rock
- (M) Metamorphic Rock
- (Lat) Limestone
- (P) Plutonic Rock

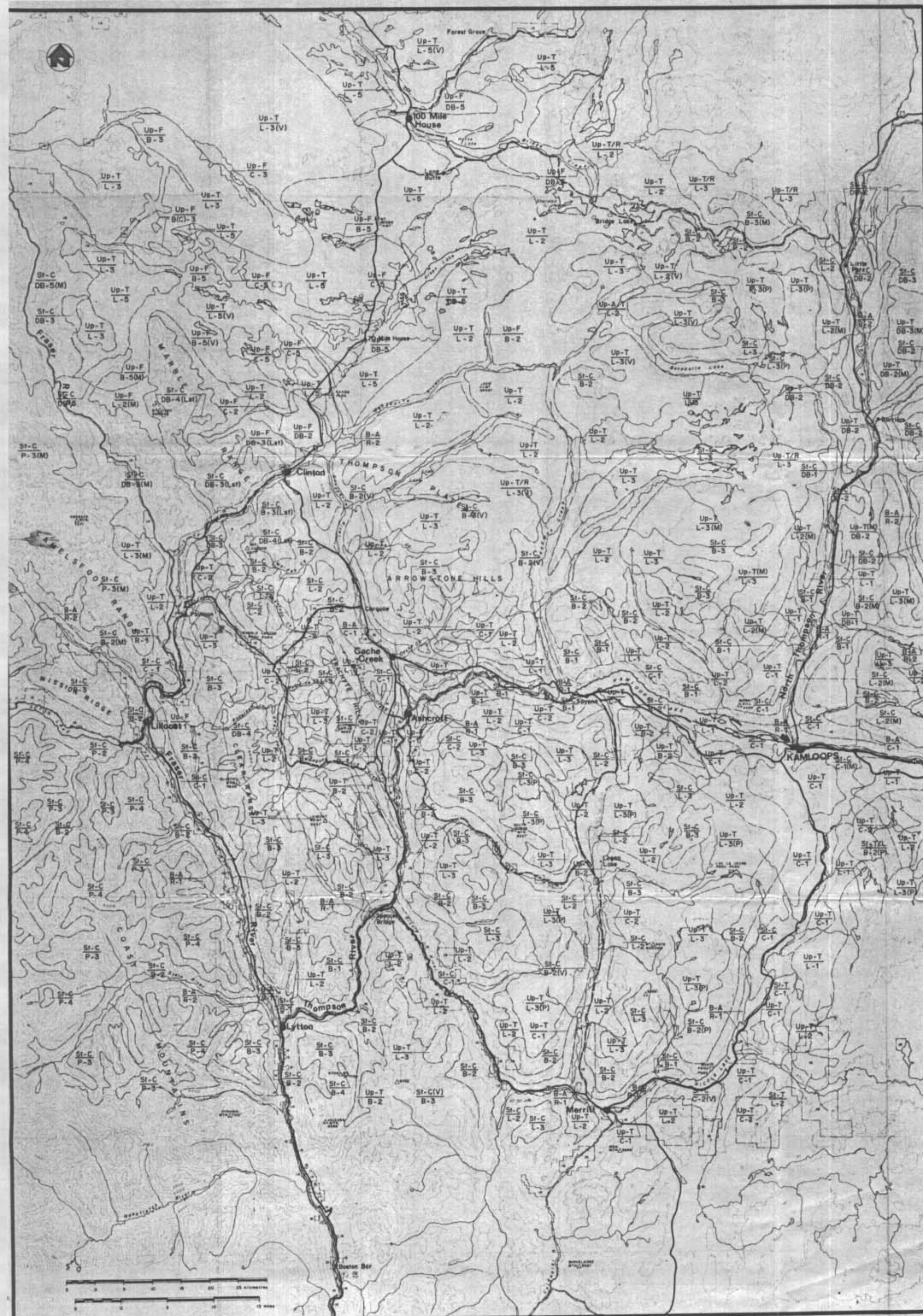
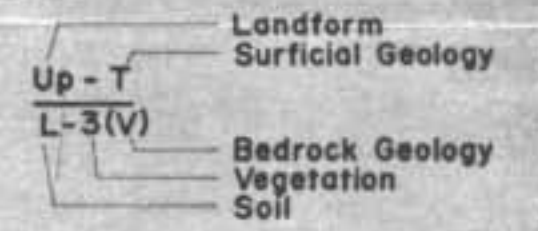
SOIL

- L Luvisol
- P Podzol
- B Brunisol
- DB Dystric Brunisol
- R Regosol
- C Chernozem

BIOGEOCLIMATIC ZONE

- 1 Ponderosa Pine/Bunchgrass
- 2 Interior Douglas-fir
- 3 Engelmann Spruce/Subalpine Fir
- 4 Alpine Tundra
- 5 Caribou Aspen/Douglas-fir

EXAMPLE

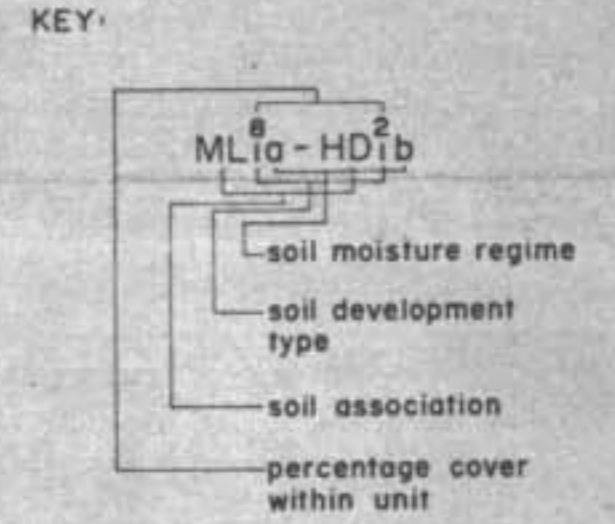


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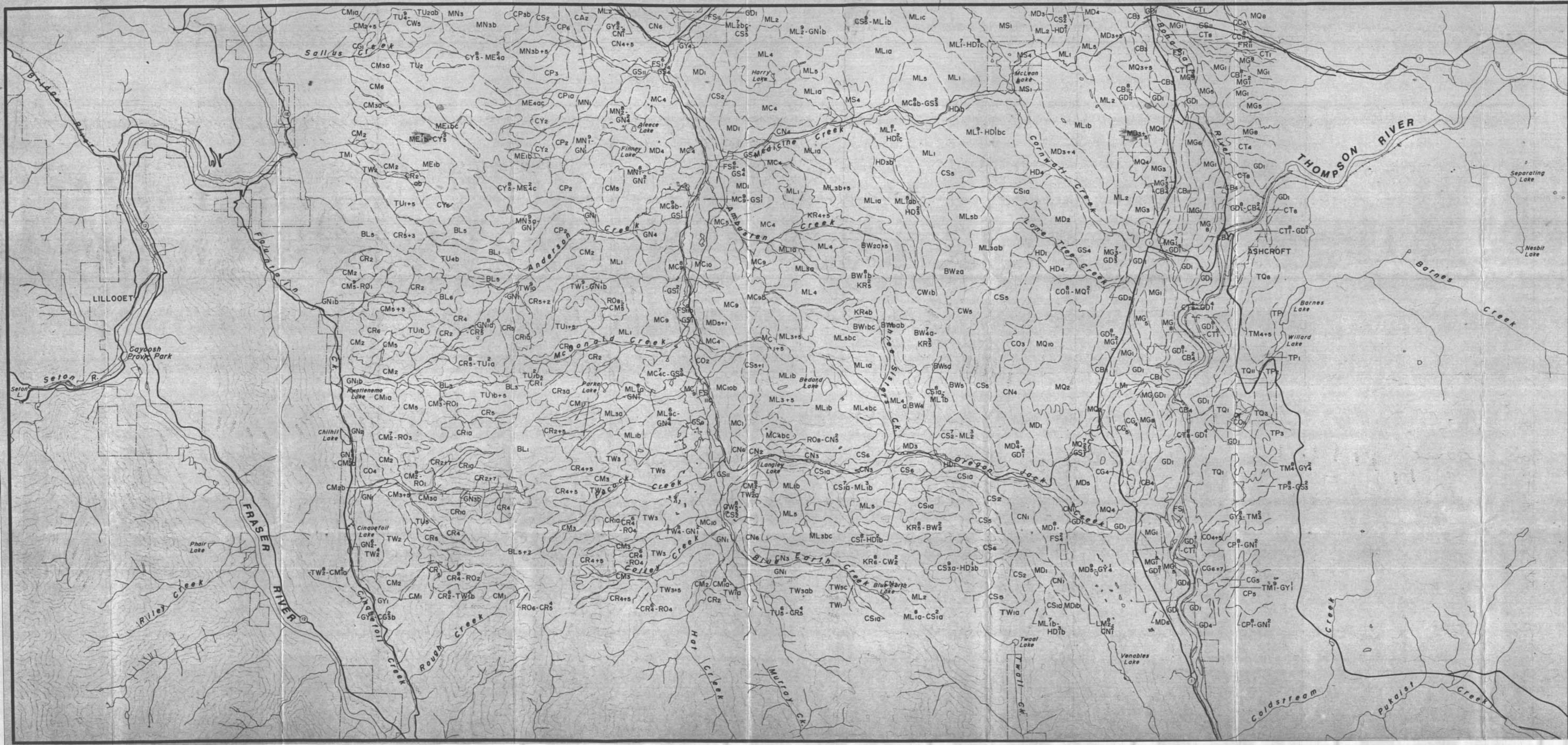
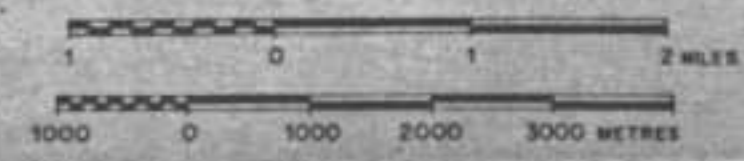
HAT CREEK PROJECT DETAILED ENVIRONMENTAL STUDIES

MAP 4-3b
SOILS

continued from northern map sheet



Information Provided by:
B.C. Ministry of Agriculture



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HAT CREEK PROJECT DETAILED ENVIRONMENTAL STUDIES

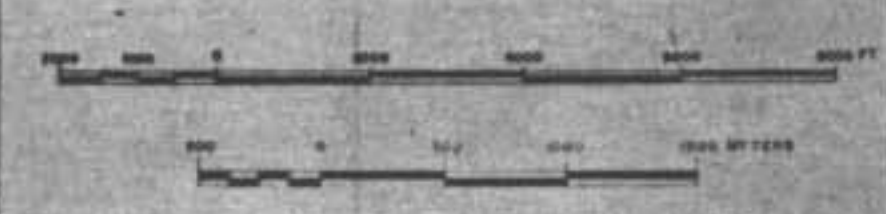
MAP 4-40

SOILS SITE SPECIFIC STUDY AREA

HAT CREEK SOILS

MAP CODE	SOIL DEVELOPMENT	PARENT MATERIAL
1	CARBONATED CUMULIC REGOSOL	ALLUVIAL STREAM AND FAN DEPOSITS
2	CARBONATED HUMIC GLEYSOL	ALLUVIAL STREAM AND FAN DEPOSITS
3	CARBONATED GLEYSOL	ALLUVIAL STREAM AND FAN DEPOSITS
4	ORTHIC REGOSOL	ALLUVIAL STREAM AND FAN DEPOSITS
5	DEGRADED EUTRIC BRUNISOL	GLACIAL OUTWASH DEPOSITS
5a	DEGRADED EUTRIC BRUNISOL / ORTHIC DARK BROWN CHERNOZEM	GLACIAL OUTWASH DEPOSITS
5b	DEGRADED EUTRIC BRUNISOL / ORTHIC DARK BROWN CHERNOZEM	GLACIAL OUTWASH DEPOSITS
7	ORTHIC DARK BROWN CHERNOZEM	GLACIAL OUTWASH DEPOSITS
8	CALCAREOUS DARK GREY CHERNOZEM	GLACIAL TILL WITH LITHIC COMPONENT
9	CALCAREOUS DARK GREY CHERNOZEM	GLACIAL TILL DEPOSITS
10	DEGRADED EUTRIC BRUNISOL	GLACIAL TILL DEPOSITS
11	LITHIC BLACK CHERNOZEM	LITHIC COMPONENT
12	DEGRADED EUTRIC BRUNISOL	GLACIAL TILL DEPOSITS
13	CALCAREOUS BLACK CHERNOZEM	GLACIAL TILL DEPOSITS
14	ORTHIC DARK BROWN CHERNOZEM	GLACIAL TILL DEPOSITS
15	ORTHIC DARK BROWN CHERNOZEM	GLACIAL TILL DEPOSITS
16	CARBONATED BLACK CHERNOZEM	GLACIAL TILL DEPOSITS
17	ORTHIC DARK BROWN CHERNOZEM	GLACIAL TILL DEPOSITS
18	DEGRADED EUTRIC BRUNISOL	GLACIAL TILL DEPOSITS
19	DEGRADED EUTRIC BRUNISOL / ORTHIC DARK BROWN CHERNOZEM	GLACIAL TILL DEPOSITS
20a	REGOSOL	LACUSTRINE TILL DEPOSITS
20b	REGOSOL	LACUSTRINE TILL DEPOSITS
20c	ORTHIC EUTRIC BRUNISOL	LACUSTRINE TILL DEPOSITS
20d	ORTHIC EUTRIC BRUNISOL	LACUSTRINE TILL DEPOSITS
20e	REGOSOLIC ORTHIC EUTRIC BRUNISOL	LACUSTRINE TILL DEPOSITS
21	ORTHIC DARK BROWN CHERNOZEM	GLACIAL TILL DEPOSITS
22	DEGRADED EUTRIC BRUNISOL	GLACIAL TILL DEPOSITS
23	ORTHIC DARK BROWN CHERNOZEM	GLACIAL TILL DEPOSITS
24	REGO BROWN CHERNOZEM	GLACIAL TILL DEPOSITS
25	ORTHIC BROWN CHERNOZEM / REGO BROWN CHERNOZEM	GLACIAL TILL DEPOSITS
26	ORTHIC BROWN CHERNOZEM	GLACIAL TILL DEPOSITS
27	CARBONATED BLACK CHERNOZEM	GLACIAL TILL DEPOSITS
28	REGO BROWN CHERNOZEM	ALLUVIAL STREAM AND FAN DEPOSITS
29	REGO BROWN CHERNOZEM	GLACIAL TILL DEPOSITS
30	SALINE GLEYSOL	ALLUVIAL STREAM AND FAN DEPOSITS
31	DEGRADED EUTRIC BRUNISOL / REGO BROWN CHERNOZEM	GLACIAL TILL DEPOSITS
32	LITHIC BROWN CHERNOZEM	LITHIC COMPONENT
33	ORTHIC GREY LUVISOL	COLLUVIAL FAN AND GLACIAL TILL
34	LITHIC EUTRIC BRUNISOL	COLLUVIAL FAN AND GLACIAL TILL
35	DEGRADED EUTRIC BRUNISOL	GLACIAL TILL DEPOSITS
36	REGO DARK GREY CHERNOZEM	GLACIAL TILL DEPOSITS
37	ORTHIC GREY LUVISOL / DEGRADED EUTRIC BRUNISOL	GLACIAL TILL DEPOSITS
38	ORTHIC GREY LUVISOL	GLACIAL TILL DEPOSITS
39	DEGRADED EUTRIC BRUNISOL	GLACIAL OUTWASH DEPOSITS
40	ORTHIC GREY LUVISOL	GLACIAL TILL DEPOSITS
41	ORTHIC GREY LUVISOL	GLACIAL TILL DEPOSITS
42	ORTHIC GREY LUVISOL / ORTHIC REGOSOL	GLACIAL TILL DEPOSITS
43	DEGRADED EUTRIC BRUNISOL	GLACIAL TILL DEPOSITS
44	DEGRADED EUTRIC BRUNISOL / REGO BROWN CHERNOZEM	GLACIAL TILL DEPOSITS
45	DEGRADED EUTRIC BRUNISOL	GLACIAL FLUVIAL DEPOSITS
46	DEGRADED EUTRIC BRUNISOL	GLACIAL FLUVIAL DEPOSITS
47	GLEYED ORTHIC GREY LUVISOL	GLACIAL TILL DEPOSITS
48	ORTHIC GREY LUVISOL / DEGRADED EUTRIC BRUNISOL	GLACIAL TILL DEPOSITS
49	ORTHIC DARK GREY CHERNOZEM / ORTHIC GREY LUVISOL	GLACIAL TILL DEPOSITS
50	LITHIC GREY LUVISOL	GLACIAL TILL WITH LITHIC COMPONENT
51	CALCAREOUS BLACK CHERNOZEM	GLACIAL TILL AND OUTWASH DEPOSITS
52	ORTHIC GREY LUVISOL / GLEYED GREY LUVISOL	GLACIAL TILL DEPOSITS
53	CALCAREOUS BLACK CHERNOZEM	ALLUVIAL STREAM AND FAN DEPOSITS
54	ORTHIC GREY LUVISOL / LITHIC GREY LUVISOL	GLACIAL TILL WITH LITHIC COMPONENT
55	GLEYED CARBONATED BLACK CHERNOZEM	ALLUVIAL STREAM AND FAN DEPOSITS
56	ORTHIC DARK BROWN CHERNOZEM / CALCAREOUS BLACK CHERNOZEM	GLACIAL FLUVIAL DEPOSITS
57	ORTHIC DARK BROWN BRUNISOL / DEGRADED EUTRIC BRUNISOL	COLLUVIAL FAN DEPOSITS
58	LITHIC DARK GREY CHERNOZEM	GLACIAL TILL WITH LITHIC COMPONENT
59	CALCAREOUS BLACK CHERNOZEM	GLACIAL TILL AND FLUVIAL DEPOSITS
60	GLEYED ORTHIC LUVISOL	GLACIAL TILL DEPOSITS
61	ORTHIC DARK BROWN CHERNOZEM / DEGRADED EUTRIC BRUNISOL	GLACIAL FLUVIAL DEPOSITS
62	ORTHIC GREY LUVISOL / DEGRADED EUTRIC BRUNISOL	GLACIAL TILL DEPOSITS
63	ORTHIC DARK BROWN CHERNOZEM / DEGRADED EUTRIC BRUNISOL	GLACIAL TILL DEPOSITS
64	DEGRADED EUTRIC BRUNISOL / LITHIC DEGRADED EUTRIC BRUNISOL	COLLUVIAL FAN AND GLACIAL TILL
B	BLUFF	
RO	ROCK OUTCROP	
SW	SWAMP	

...CONTINUED ON MAP 4-40



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HAT CREEK PROJECT DETAILED ENVIRONMENTAL STUDIES

MAP 4-4b SOILS SITE SPECIFIC STUDY AREA

...CONTINUED FROM MAP 4-4a

ASHCROFT SOILS*

MAP CODE	SOIL SERIES NAME	SOIL DEVELOPMENT	PARENT MATERIAL
AY	ANGLESEY	REGO BROWN CHERNOZEM	GLACIAL OUTWASH DEPOSITS
BS	BARNES	MULL REGOSOL	ALLUVIAL-COLLUVIAL FAN DEPOSITS
BE	BASQUE	ORTHIC BROWN CHERNOZEM	GLACIAL TILL DEPOSITS
BN	BONAPARTE	REGO BROWN CHERNOZEM	ALLUVIAL STREAM AND FAN DEPOSITS
CC	CADRE CREEK	SALINE REGO BROWN CHERNOZEM	ALLUVIAL-COLLUVIAL FAN DEPOSITS
CR	CARQUILLE	GLEVED MULL REGOSOL	ALLUVIAL RIVER DEPOSITS
CT	CHEETSUM	REGO BROWN CHERNOZEM	GLACIAL TILL DEPOSITS
JS	JOEROS	REGO BROWN CHERNOZEM	AEOLIAN DEPOSITS
MA	MCABEE	ORTHIC BROWN CHERNOZEM	LACUSTRINE TILL DEPOSITS
NE	NEPA	ORTHIC BROWN CHERNOZEM	ALLUVIAL RIVER DEPOSITS
SE	SAVONA	MULL REGOSOL	AEOLIAN DEPOSITS
SY	SEMLIN	ORTHIC BROWN CHERNOZEM	ALLUVIAL-COLLUVIAL FAN DEPOSITS
TL	TAWHEEL	REGO BROWN CHERNOZEM	ALLUVIAL-COLLUVIAL FAN DEPOSITS
TN	THOMPSON	ORTHIC REGOSOL	ALLUVIAL RIVER DEPOSITS
WA	WALHACHIN	ORTHIC BROWN CHERNOZEM	GLACIAL OUTWASH DEPOSITS

TEXTURE**

S SAND I LOAM
 SL LOAMY SAND SLT LOAM
 SLY SANDY LOAM CLY CLAY LOAM
 FS FINE SANDY LOAM SILT CLAY LOAM
 S* GRAVELLY (ESTIMATED CONTENT 15%+)
 ST STONY (ESTIMATED CONTENT 15%+)

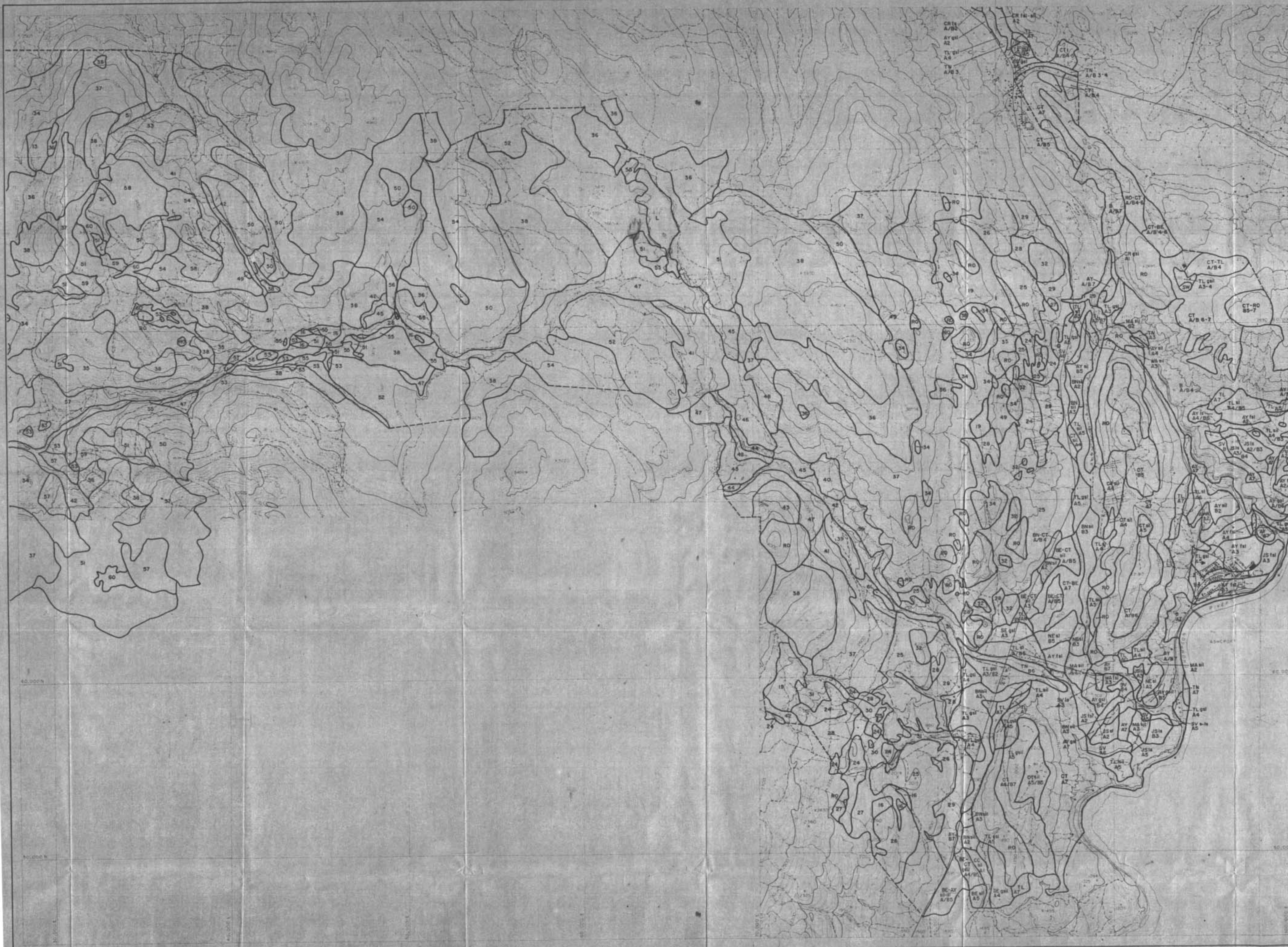
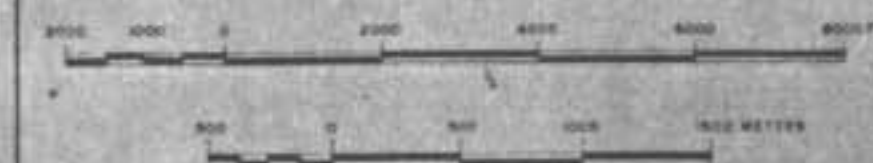
TOPOGRAPHIC CLASS**

CLASS	% SLOPE
SMOOTH, UNIFORM SLOPES	
A0 SMOOTH UNDRAINED BASIN	0
A1 SMOOTH LEVEL	0-0.5
A2 SMOOTH VERY GENTLY SLOPING	0.5-2
A3 SMOOTH GENTLY SLOPING	2-5
A4 SMOOTH MODERATELY SLOPING	5-9
A5 SMOOTH STEEPLY SLOPING	10-15
A6 SMOOTH VERY STEEPLY SLOPING	16-30
A7 SMOOTH HILL	OVER 30
IRREGULAR SLOPES	
B0 IRREGULAR (HUMMOCKY) BASIN	0
B1 IRREGULAR LEVEL	0-0.5
B2 IRREGULAR VERY GENTLY SLOPING	0.5-2
B3 IRREGULAR GENTLY SLOPING	2-5
B4 IRREGULAR MODERATELY SLOPING	5-9
B5 IRREGULAR STEEPLY SLOPING	10-15
B6 IRREGULAR VERY STEEPLY SLOPING	16-30
B7 IRREGULAR HILL	OVER 30

* EXTRACTED FROM BCDA REPORT, SOIL SURVEY OF THE ASHCROFT-SAVONA AREA, THOMPSON RIVER VALLEY, B.C. 1963.

** APPLIES TO ASHCROFT SOILS ONLY.

EXAMPLE:



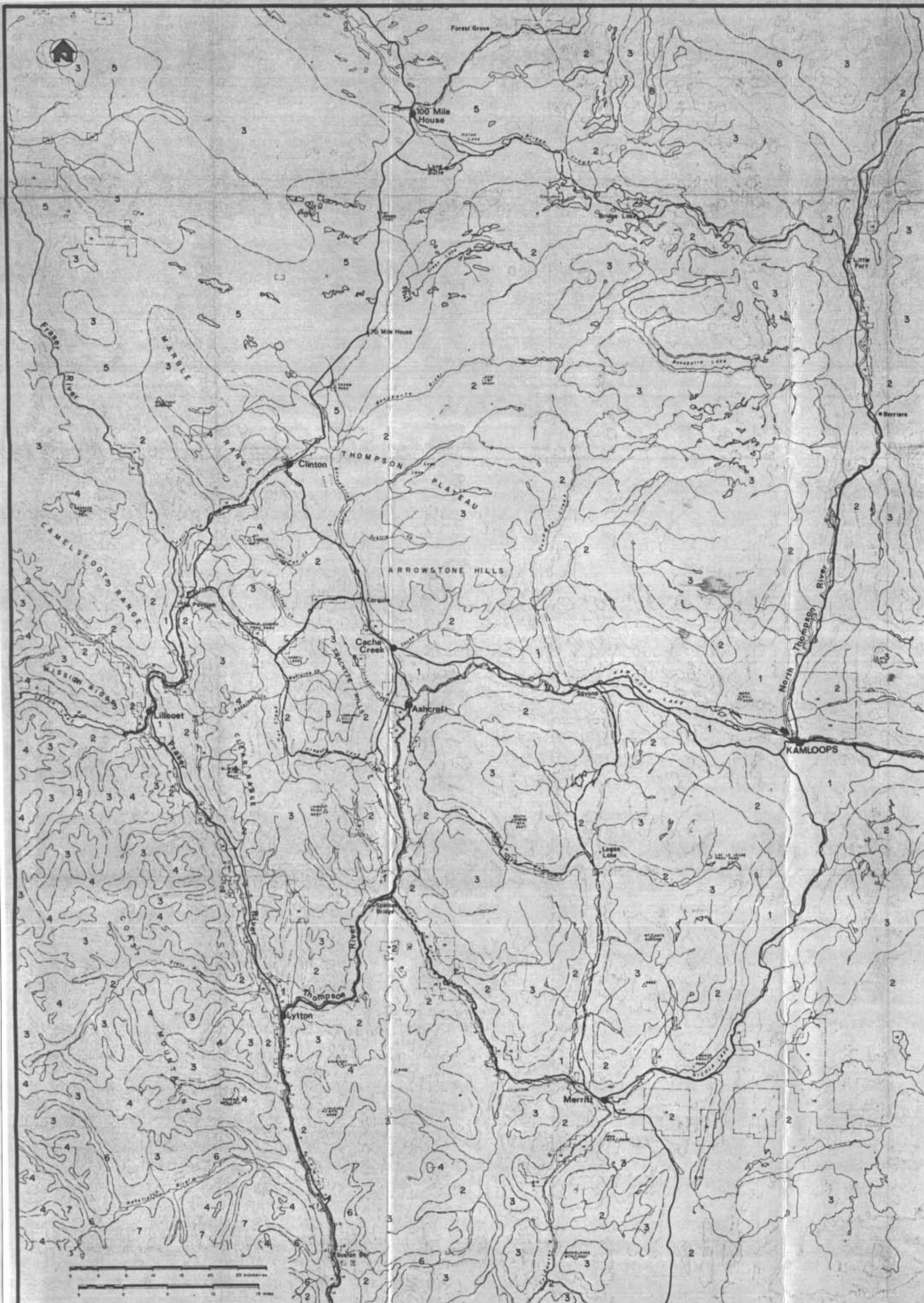
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**HAT CREEK PROJECT
DETAILED
ENVIRONMENTAL
STUDIES**

MAP 4-5
**REGIONAL
VEGETATION**

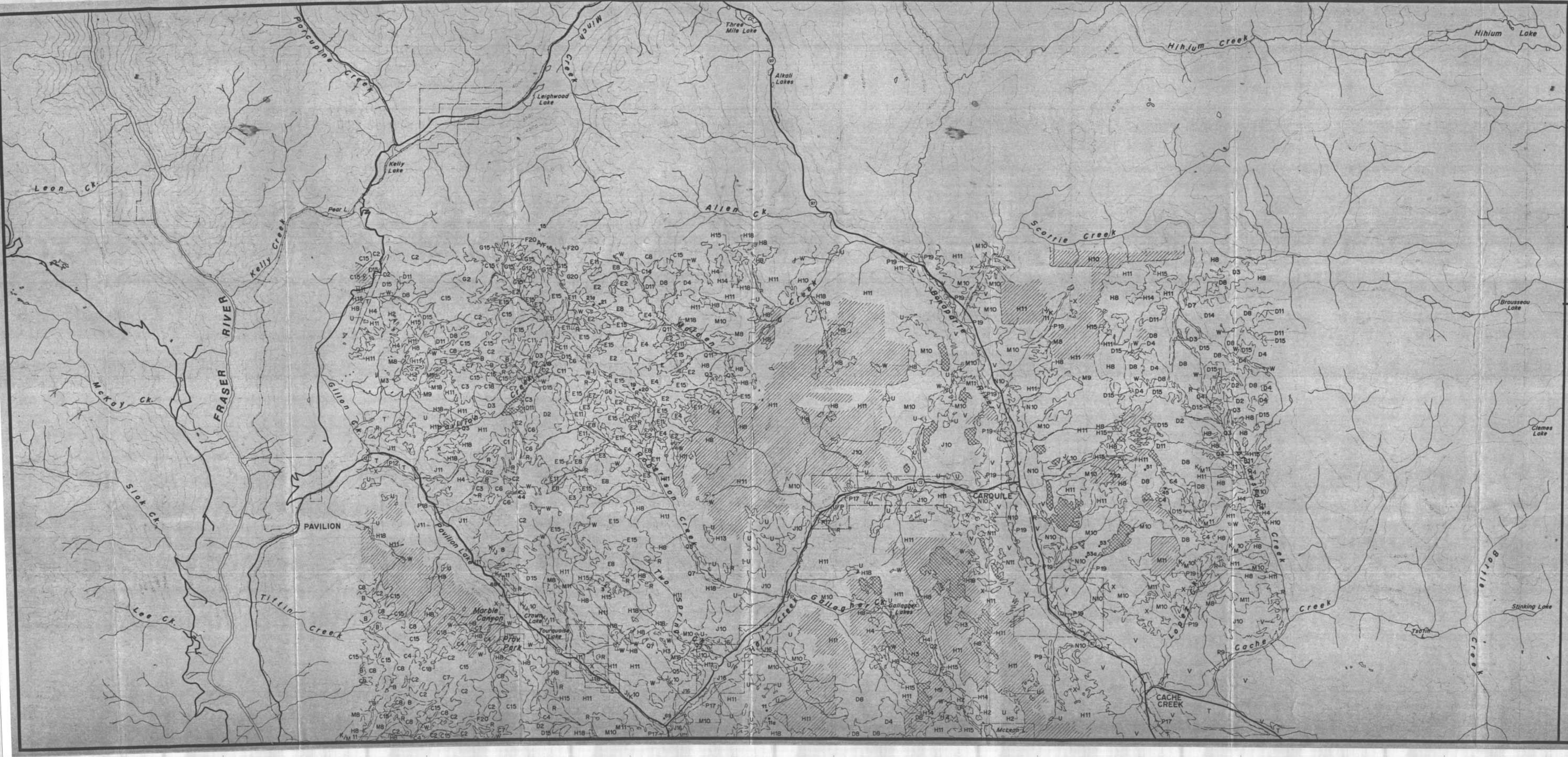
- 1 Ponderosa Pine - Bunchgrass Zone
- 2 Interior Douglas-fir Zone
- 3 Engelmann Spruce - Subalpine Fir Zone
- 4 Alpine Tundra Zone
- 5 Cariboo Aspen - Lodgepole Pine - Douglas-fir Zone
- 6 Coastal Western Hemlock Zone
- 7 Subalpine Mountain Hemlock Zone
- 8 Interior Western Hemlock Zone



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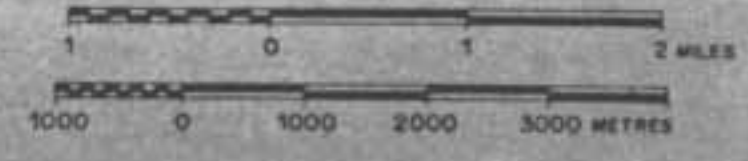
HAT CREEK PROJECT DETAILED ENVIRONMENTAL STUDIES

MAP 4-6a
VEGETATION



- ALPINE ZONE**
- A Mountain Avens - Sedge Association
- ENGELMANN SPRUCE - SUBALPINE FIR ZONE**
- C Engelmann Spruce - Grouseberry Association
- D Engelmann Spruce - Grouseberry - Pinegrass Association
- E Engelmann Spruce - Grouseberry - White Rhododendron Association
- F Engelmann Spruce - Willow - Red Heather Parkland Association
- G Engelmann Spruce - Grouseberry - Lupine Association
- INTERIOR DOUGLAS-FIR ZONE**
- H Douglas-fir - Pinegrass Association
- J Douglas-fir - Bunchgrass Association
- K Douglas-fir - Spiraea - Bearberry Association
- M Douglas-fir - Bunchgrass - Pinegrass Association
- PONDEROSA PINE - BUNCHGRASS ZONE**
- N Ponderosa Pine - Bunchgrass Association
- INTRAZONAL**
- P Riparian Association
- Q Engelmann Spruce - Horsetail Association
- W Willow - Sedge Bog Association
- GRASSLAND ASSOCIATIONS**
- B Highland Grassland
- U Kentucky Bluegrass Association
- X Bunchgrass - Kentucky Bluegrass Association
- Y Sagebrush - Bluebunch Wheatgrass Association
- S Saline Depression Association
- V Big Sage - Bunchgrass Association

... continued on southern map sheet



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HAT CREEK PROJECT DETAILED ENVIRONMENTAL STUDIES

MAP 4-6b
VEGETATION

... continued from northern map sheet

FOREST TYPES

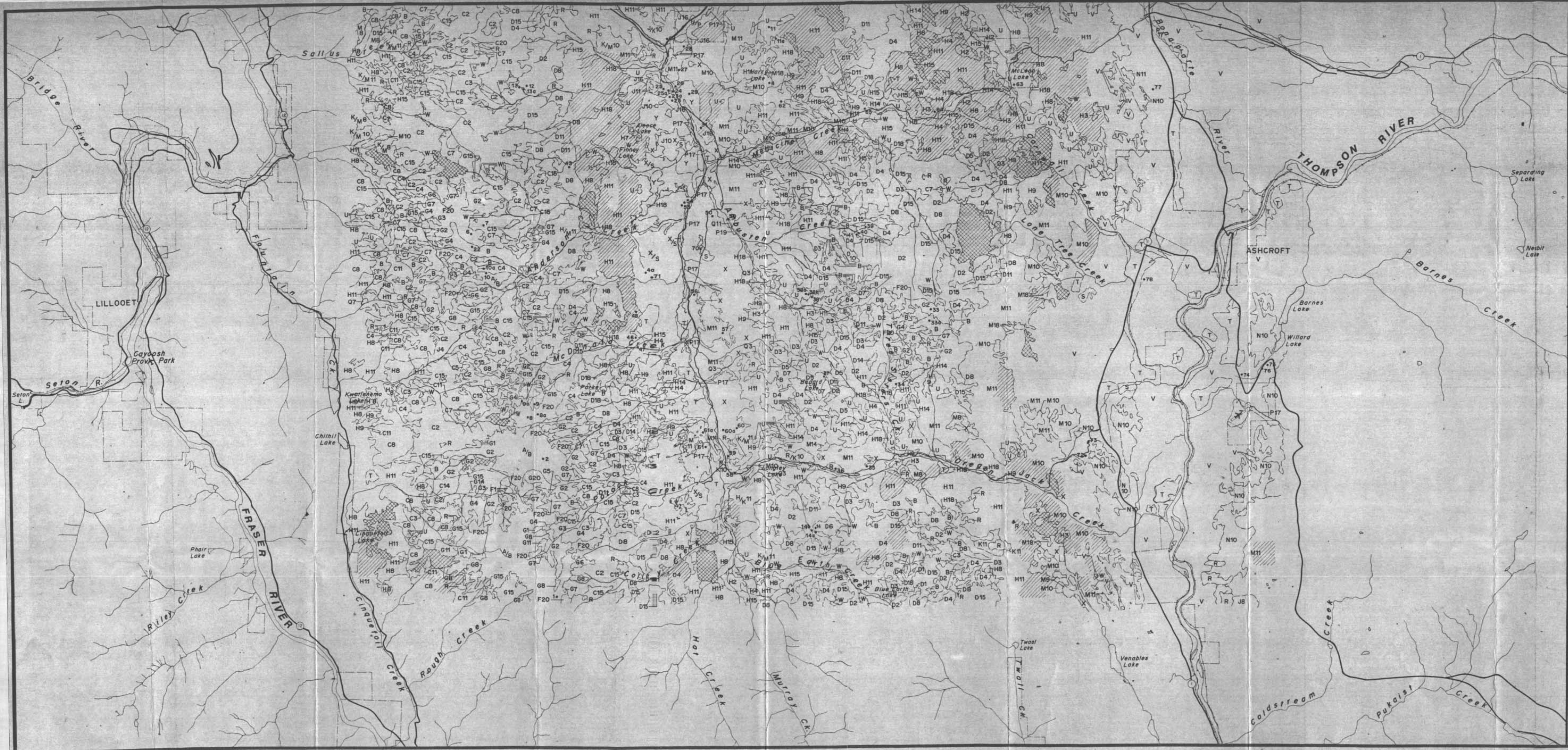
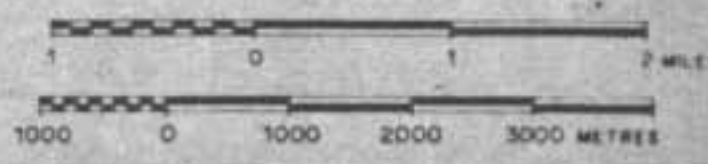
- 1 Engelmann Spruce - Subalpine Fir
- 2 Engelmann Spruce - Lodgepole Pine
- 3 Engelmann Spruce - Douglas-fir
- 4 Engelmann Spruce - Douglas-fir - Lodgepole Pine
- 5 Engelmann Spruce - Aspen
- 6 Engelmann Spruce - Subalpine Fir - Lodgepole Pine
- 7 Engelmann Spruce
- 8 Douglas-fir - Lodgepole Pine
- 9 Douglas-fir - Aspen
- 10 Douglas-fir - Ponderosa Pine
- 11 Douglas-fir
- 12 Subalpine Fir - Lodgepole Pine
- 13 Subalpine Fir
- 14 Lodgepole Pine - Aspen
- 15 Lodgepole Pine
- 16 Ponderosa Pine
- 17 Cottonwood
- 18 Aspen
- 19 Cottonwood - Aspen
- 20 Alpine Forest

- Vegetation Sample Plot
- T Cultivated Field
- R Rock
- ▨ Logged Area
- ▩ Not Satisfactorily Restocked

EXAMPLE:

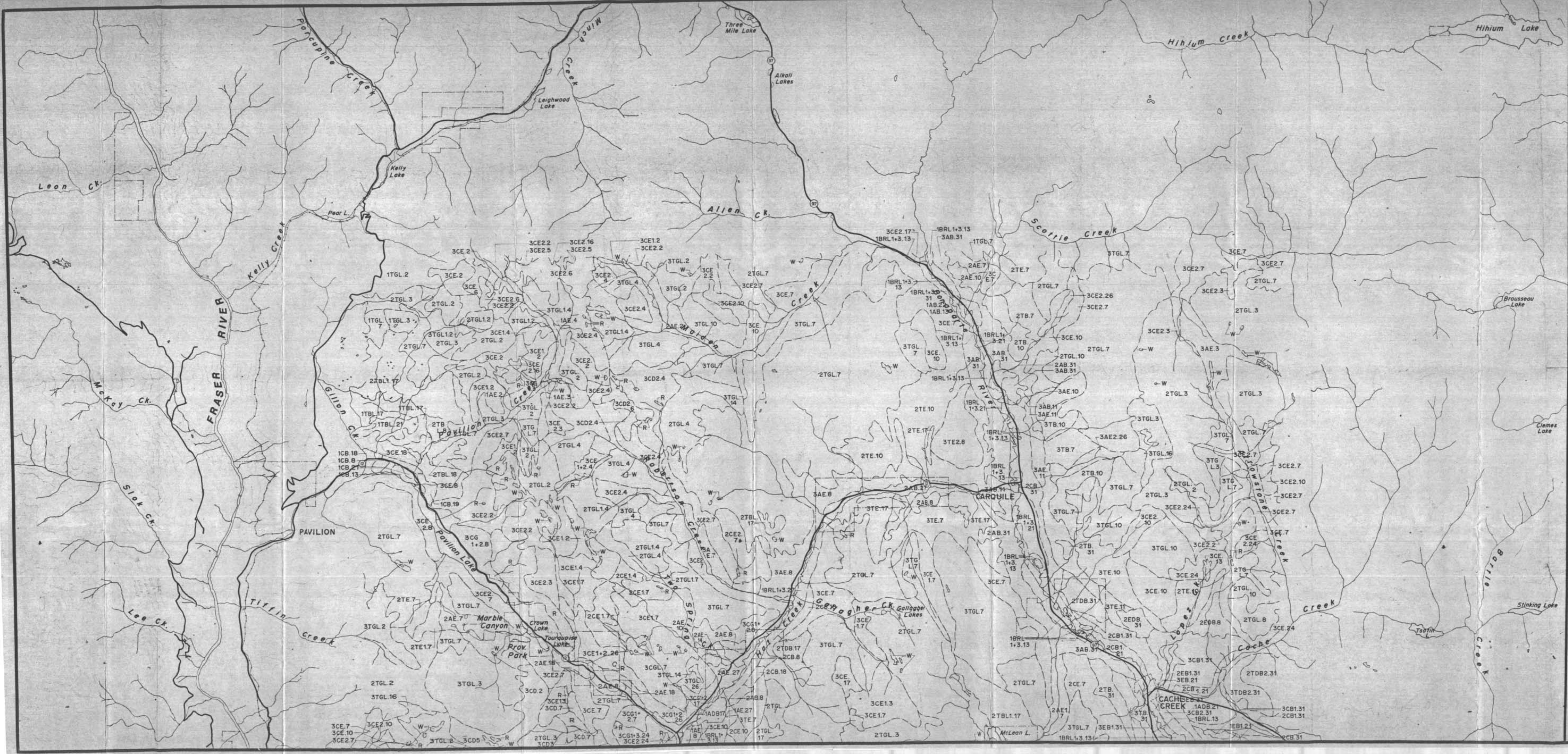
M18 • Interior Douglas-fir Biogeoclimatic Zone; Douglas-fir - Bunchgrass - Pinegrass Association; Aspen Forest Type

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CONSULTANTS LIMITED



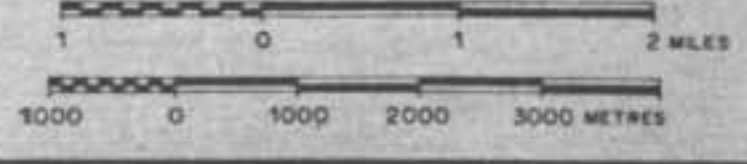
**HAT CREEK
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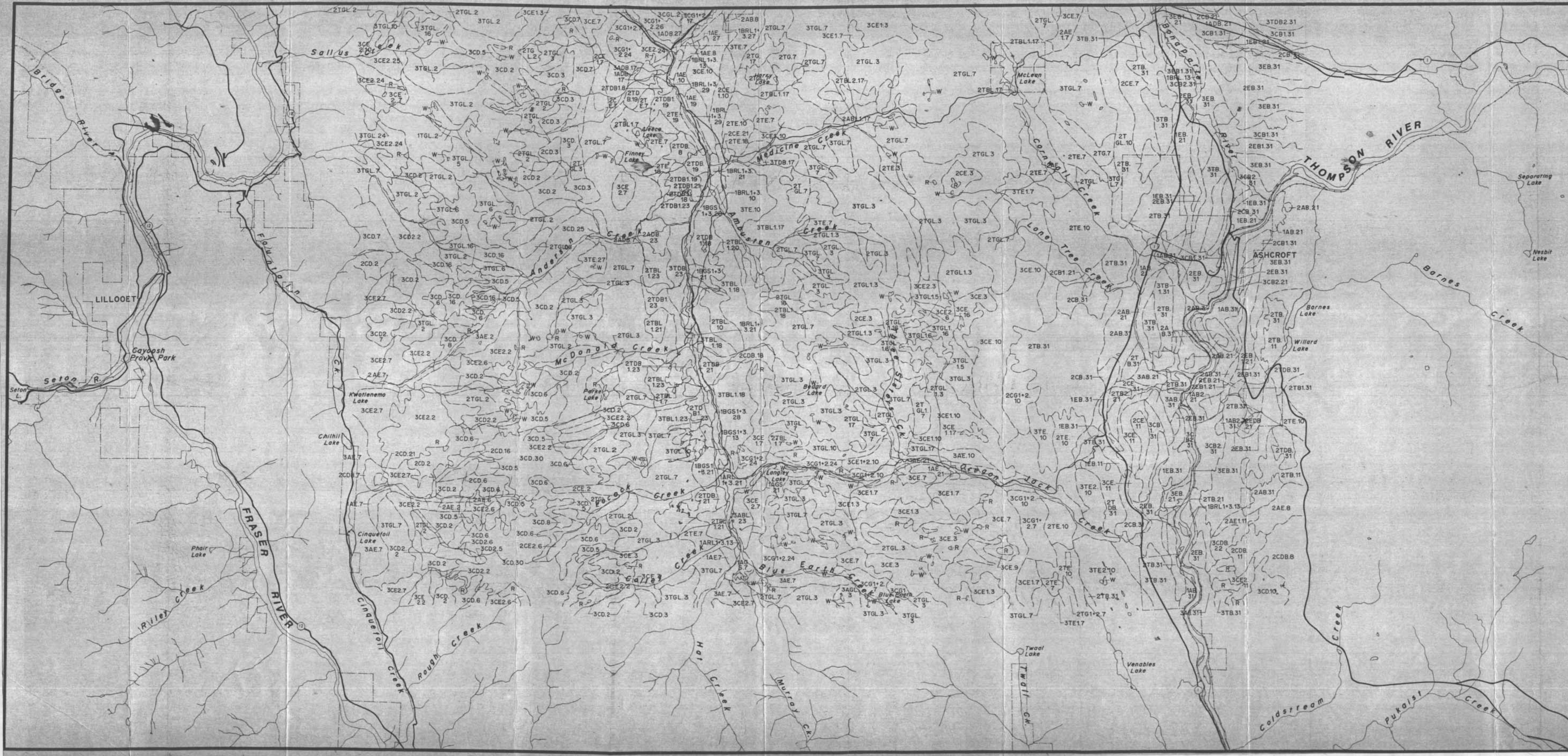
MAP 4-7a
BIOPHYSICAL



- LANDFORM**
- 1 Bottomland or Plateau, 0 to 9 Percent
 - 2 Sloping Land, 10 to 30 Percent
 - 3 Steepland, Over 30 Percent
- PARENT MATERIAL**
- A Glacial-fluvial
 - B Alluvium
 - C Colluvium
 - T Glacial Till
 - E Aeolian
 - R Rock
- SOILS**
- B Brown Chernozems
 - DB Dark Brown Chernozems
 - G Dark Grey Chernozems
 - BL Black Chernozems
 - E Eutric Brunisols
 - D Dystric Brunisols
 - RL Regosols
 - GL Gray Luvisols
 - GS Gleysols
- SOIL MODIFIER**
- 1 High Alkalinity and/or Salinity Potential
 - 2 Erosion or Mass Movement
 - 3 Flooding
- VEGETATION ASSOCIATIONS**
- 1 Mountain Avens-Sedge Association
 - 2 Engelmann Spruce-Grouseberry Association
 - 3 Engelmann Spruce-Grouseberry-Pinegrass Association
 - 4 Engelmann Spruce-Grouseberry-White Rhododendron Association
 - 5 Engelmann Spruce-Willow-Red Heather Parkland Association

...continued on southern map sheet





**HAT CREEK
PROJECT
DETAILED
ENVIRONMENTAL
STUDIES**

MAP 4-7b
BIOPHYSICAL

- ...continued from northern map sheet
- 6 Engelmann Spruce - Grouseberry-Lupine Association
 - 7 Douglas-fir - Pinegrass Association
 - 8 Douglas-fir - Bunchgrass Association
 - 9 Douglas-fir - Spirea - Bearberry Association
 - 10 Douglas-fir - Bunchgrass - Pinegrass Association
 - 11 Ponderosa Pine - Bunchgrass Association
 - 13 Riparian Association
 - 14 Engelmann Spruce - Horsetail Association
 - W Willow - Sedge Bog Association
 - 16 Highland Grassland Association
 - 17 Kentucky Bluegrass Association
 - 18 Bunchgrass - Kentucky Bluegrass Association
 - 19 Sagebrush - Bluebunch Wheatgrass Association
 - 20 Saline Depression Association
 - 21 Cultivated Field
 - 23 Bunchgrass - Kentucky Bluegrass / Saline Depression Complex
 - 24 Douglas-fir - Spirea - Bearberry / Douglas-fir - Bunchgrass - Pinegrass Complex
 - 25 Douglas-fir - Pinegrass / Douglas-fir - Bunchgrass - Pinegrass Complex
 - 26 Douglas-fir - Spirea - Bearberry / Douglas-fir - Bunchgrass Complex
 - 27 Kentucky Bluegrass / Riparian Complex
 - 28 Bunchgrass - Kentucky Bluegrass / Riparian Complex
 - 29 Sagebrush - Bluebunch Wheatgrass / Riparian Complex
 - 30 Mountain Avens - Sedge / Highland Grassland Complex
 - 31 Big Sagebrush - Bunchgrass Association

EXAMPLE:
3CB2.23

- vegetation association number
- optional soil modifier number(s)
- soil letter(s)
- parent material letter
- landform number

