Misty Fiords Monument
Channel Type Verification

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Alaska Department of Fish and Game
Division o f Commercial Fisheries
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MISTY FIORDS MONUMENT CHANNEL TYPE VERIFICATION

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TABLE OF CONTENTS

Page

CHANNEL TYPE VERIFICATION ACTIVITIES 1

VERIFICATION PROCEDURES 2

ADDITIONS TO THE ANADROMOUS WATERS CATALOG 13

POSSIBLE ENHANCEMENT SITES 14

ENHANCEMENT SITES MAP 16

RIPARIAN VEGETATION SURVEYS 17

RIPARIAN VEGETATION BY SAMPLE SITES 18

VERIFICATION SITE MAP BY VCU 24

VERIFICATION CARDS AND SITE PHOTOS 25

CHANNEL TYPE DISTRIBUTION CHART 39

SUMMARY OF CHANNEL TYPE DIFFERENTIA 40

FOREST PLANT ASSOCIATIONS 54

VEGETATION CODES FOR NON-FORESTED PLANT ASSOCIATIONS 56

MISTY FIORDS NATIONAL MONUMENT CHANNEL TYPE VERIFICATION ACTIVITIES, JUNE 1989

During the winter and spring of 1988/89, the Land Use Project of the Alaska Deptartment of Fish and Game, working under contract to the Forest Service, channel typed Misty Fiords National Monument. Channel typing is a process developed by the Forest Service which utilizes 4 inch/mile high resolution stereoscopic photographs to map stream channels. When viewed under a stereoscope, different stream characteristics such as width, substrate composition, bank control, Large Woody Debris content, gradient, the presence of cascades and barriers, and surrounding canopy types can often be discerned. These stream channels, often too small to have been mapped on USGS 1:63,360 series topographic maps, are mapped and catagorized into one of some 65 different Channel Types and Channel Type Phases based on these and other criteria. During the field season it is very informative to ground truth segments of mapped channel types, and to collect a variety of information at each site. The Misty Fiords area, due to its extensive glaciation and high number of glacial systems, is somewhat atypical of the countyside usually encountered in Southeast,so it was especially valuable to verify any channel types that may have looked unusual. Also, several barriered systems with valuable spawning and rearing habitat above the barriers were overflown and surveyed for potential fish enhancement activities.

CHANNEL TYPE VERIFICATION PROCEDURES

Field verification consists of sampling representative areas of a given channel type segment for the taxonomic unit differentia. The primary purpose of this sampling is to verify that channel type mapping, based on aerial photographic interpretation, is accurate. The secondary purpose of field verification is to characterize key physical features of channel type classification units by field data on representative stream segments. These data will help define class limits for channel type units.

Site selection: All verification sampling is performed using "representative" sites to characterize the physical properties of an entire channel type segment (hereafter referred to as "segment"). The term "site" refers to a short channel area which is a representative subset of the entire segment, and which is used as the sampling unit. The representative sample site is a channel area which has physical features that occur most frequently for the segment being sampled. These features, which are present or absent within the segment as a whole, have the same occurrence frequency in the site. The predominant range in physical dimensions that occurs for key features throughout the segment also occurs in a similar manner within the site. This site also demonstrates the same spatial patterns of features which occur over the entire segment. The site is not necessarily uniform in its physical characteristics. Rather, the variation in these characteristics occurs in an amount and pattern similar to that of the entire segment.

The representativeness of each site is determined before any data collection occurs. Sites which have been extensively disturbed by road construction, mining, recreation, or other developments are not to be sampled. Sites that are to be sampled which occur downstream of such developments should be noted as such on the data card. Site representativeness is first assessed by selecting "potential" sampling sites in the office prior to field work. In the field, each potential site is assessed by conducting a brief ground survey of several hundred meters of the segment to determine how well the potential site represents the segment. Only after site representativeness has been confirmed, does sampling begin.

The length of each sample site is to be the shorter distance of the following: 1) a two pool/riffle sequence; 2) 50 meters long if the channel bankfull width is less than 10 meters; or 3) 100 meters long if the channel bankfull width is greater than 10 meters. Sampling is to only occur at low flow stage, which is one-third or less of the bankfull stage.

Date: Record as a six digit number using a year-month-day format

VCU: Record the three digit VCU number

Segment: Record the three digit number

Site: Record the four digit number assigned to each sampling site. (7000 series Edgington, 1989)
(8000 series Cariello, 1989)
(9000 series Derr, 1989)

Area: Record the standard Area number:
Stikine Area - 02
Chatham Area - 03
Ketchikan Area - 05

1988 Amendment:
Ranger District: Record the standard RangerDistrict number.

Petersburg - 010	Sitka - 010	Craig - 010
Wrangell - 020	Hoonah - 020	Ketchikan - 020
Admiralty NM -040	Juneau - 030	Thorne Bay -040

Management Area: Record the standard three character TLMP Management Area label

Subsection: Record the two digit subsection number (from the watershed field map)

Quarter-Quad: Record the name of the USGS quarter-quadrangle which covers the sample site. The name should be the same as that at the bottom right hand side of the USGS quad.

Stream Name: Record the stream name for the drainage basin containing the sample site.

ADF&G Number: Record the ADF&G number for the stream segment as it appears in the ADF&G Anadromous Waters Catalog.

Aerial Photograph: Record the year, flight line number, roll number, and photo number of the aerial photograph covering the site. The flight year is the last two digits of the year (1984 = 84). The line number is an alphanumeric two character label. The roll and photo

numbers are one and three digit numbers, respectively.

Camera Photo: Record the three digit upstream and downstream film roll number. To establish the roll number take one or two pictures of a sheet of paper with the roll identification number printed on it. The roll identification number is increased sequentially for each new roll of film.

Record the two digit number of the upstream and downstream sample site photographs taken in the appropriate space. The number is taken from the camera counter.

Preliminary Channel Type: Record the channel type assigned during premapping to the segment being sampled (taken from the aerial photo).

Final Channel Type: Record the final channel type (determined after field verification and final correlation).

Water Temperature: Record the water temperature in degrees celsius.

Air Temperature: Record the air temperature in degrees celsius.

Weather: Identify the weather conditions during the verification (for example, rain, sun).

Time: Record the time of day the sample was taken.

Adjacent Landform: Record the predominant landform for both the left and right banks over a minimum of 10 acres (except as noted below). If more than one distinct landform occurs along the site bank, record the landform occupying the greatest length of the site. Landforms are delineated using the R-10 Landform Legend. In the office, they are determined from the aerial photograph with the mapping box containing the site. To determining the 10 acre size on an aerial photo, consider an area contained within an imaginary rectangle in which the channel is one of the short

sides and one of the long sides extends away from the channel a distance sufficient to contain 10 acres (0.25 inch by 1.0 inch area on 1:15.840 aerial photos). Landforms are verified in the field by observing landform slope, relief, dissection, and landscape position characteristics.

The only exception to the 10 acre minimum size rule is when an alluvial floodplain or river terrace occurs directly adjacent to the channel. If the floodplain or river terrace averages greater that 30 feet (10 meters) in width, and is continuous along the bank, then record the respective landform as a floodplain. If the floodplain or river terrace is discontinuous, or averages less than 30 feet in width along the bank, note it presence in the "Comments," but ignore its presence for landform identification and consider the 10 acre area extending above the floodplain or river terrace.

Canopy Type: Record the predominant canopy type for both the left and right banks over a minimum of 5 acres. If more than one distinct canopy type occurs along a site, record the canopy type occupying the greatest length of the site. Canopy types are identified using the Tongass National Forest - Chatham Area Canopy Type Legend. The canopy type is determined in the office from the aerial photograph having the effective area containing the site. It is verified in the field by observing canopy crown closure, species composition, and site productivity characteristics.

Plant Associations and Vegetation: Record the predominant Plant Association (PA) or vegetation species occurring on the left and right banks, respectively. These classifications or identifications are made while doing the sideslope angle. Record the numeric code (see below), the percent of coverage each code provides, and the distance that community extends. The vegetative transect length is the same as that for side slope, 200'.

If the vegetation community is not an

identified plant association, then record the predominant overstory, understory, and groundcover vegetation species using the appropriate numeric codes (see "Vegetation Codes for Nonforest Plant Associations"). For each species, record the following:

Specie: record the specie code.

Cover: record the canopy coverage in percent.

The subsequent columns are used to record any additional vegetation community breaks in the same fashion along the 200 foot transect. Record the distance from the channel where the breaks occur. If the vegetative community does not change between the stream and 200 feet of it, then record 200 feet as the distance under PA #1

Site Disturbed: Record whether the site has been disturbed by management activities or catastrophic natural processes. "YES" is circled if a site has one or more of the following characteristics:

a. Any obvious tree falling (selection cutting or clearcutting) has occurred within 100 feet on at least one side of the channel either immediately upstream of the site.

b. Multiple: Channels having more than one channelway or flow path occurring within the bankfull area which cover greater than 10 percent of the site bankfull width. These channels still have a single thalweg over most of their length, but the thalweg often has shorter meander wavelengths than the bankfull channel meander wavelength.

c. Braided: Channels having numerous flow-paths, discontinuous thalweg, and extensive bar and riffle development.

If "YES" is circled, note in the COMMENTS what type of disturbance occurs.

Sideslope Length and Angle: Record the adjacent sideslope distances and angles for each stream bank, RIGHT and LEFT, along a 200 foot transect laid out perpendicular to the channel banks. Slope distances and angles are recorded along the transect at each significant change in slope. Slope distances are recorded opposite RIGHT and LEFT DISTANCE and slope angles opposite "ANGLE." Slopes may be recorded as either positive or negative, no sign will be assumed to be plus, an upward slope.

Trap Results: Minnow traps, baited with fish eggs, are set for a minimum of 30 minutes. When the site sample is completed, the fish are enumerated by species, and recorded by catch per trap.

Stream Gradient: Record the stream gradient. Gradient is measured over at least two pool/riffle (or glide/riffle) sequences.

The sampler stands at the water's edge and flags their eye height on a piece of overhanging vegetation. They then walk as far down the site as possible, keeping the flagging visible, and stand at the water's edge. The gradient is determined by sighting on the flagging with the clinometer while standing straight. This number is recorded to the nearest 0.5 percent.

Incision Depth: Record the appropriate incision depth class separately for each bank. The incision depth is the distance between the channel bottom and the top of the upper bank. In entranched channels, the streambank and the valley wall may coincide. Estimate a representative section of each bank using a range finder.

Substrate: Record the percentages of the substrate size classes opposite their respective names. Percentages should be totaled to check for possible calculation errors.

Channel Pattern: Record the relative proportion of channel patterns occurring over the entire sampling site length.

a. Single: Channels having one single channelway with a single thalweg that generally parallels the banks. Side channels or overflow areas cover less than 10 percent of the site bankfull width.

b. Multiple: Channels having more than one channelway or flow path occurring within the bankfull area which cover greater than 10 percent of the site bankfull width. These channels still have a single thalweg over most of their length, but the thalweg often has shorter meander wavelengths than the bankfull channel meander wavelength.

c. Braided: Channels having numerous flowpaths, discontinuous thalweg, and extensive bar and riffle development.

Bank Control: Choose a streambank composition which best typifies the entire segment. These are:

a. Bedrock: channels contained within rock walls or with extensive outcropping along the banks and bed (greater than 15 percent of the channel length).

b. Mixed: Channels contained within a mixture of colluvial, alluvial, and bedrock materials with consistent, but not extensive, bedrock occurrence within the banks or bed (2-15 percent of the channel length).

c. Alluvium: Channels cut into alluvium with only very infrequent bedrock occurrence in the banks and bed (less than two percent of the channel length).

Stream Geometry: Stream geometry measurements are taken along a cross-section that is located at a straight section of the site and that is representative of the widths and depths occurring within the site. Locate it away from local constrictions such as large woody debris accumulations, bedrock constrictions, or large boulder accumulations. If the above mentioned conditions cannot be located, notes to that effect should be recorded in the

comment section.

Distinctive high water marks such as consistent exposures or raw bank material, significant breaks in slope on the banks and change from presence to absence of hydrophytic or disturbance vegetation are used to distinguish the mean annual high water level.

Bankfull Width and Depth. Record the bankfull width and depth. Bankfull width and depths are measured using a 100 ft. tape measure and a stadia rod.

Active Width: Active width is the width of the channel which contains water at the time of sampling.

Available Spawning Area (ASA): Record the percent of the active surface area which is ASA. This is a visual estimate that is made to the nearest 5%. Only "good" quality or better ASA is included in this estimate (do not include marginal habitat).

ASA is that area of the stream bottom used by the fish to spawn. A hard and fast definition of gravel sizes or water velocities that go together to qualify as spawning gravel is not possible. Depending on what a stream has to offer, different gravel sizes and water velocities may be used as spawning gravels.

Size and Shape - Ideally, gravels should be well rounded and approximately 1.0 to 6.0 inches in diameter. However, the size of fish using the gravels must be considered. Small resident trout may prefer to spawn in gravels less than 1.0 inch in diameter, while large king salmon can successfully work gravels 8.0 to 10.0 inches in diameter. If the gravels are open enough, the eggs may settle into them without necessity of the fish moving the gravel.

Fine Sediment Content - Spawning gravels should contain little fine materials (less than 2.0 mm in size). When gravels with low

fine content are dug into, the water passing over the site clears rapidly if it has been discolored by the digging. Gravels containing much fine material discolor the water when they are moved by a foot or shovel. In these areas, the water often takes several seconds to clear to its normal state, even in rapidly flowing areas.

Compaction - Spawning gravels are easily moved when field personnel walk on them. Gravels may be compacted due to shape (angular, flat, not rounded) or sedimentation (fines fill in interstices and form "solid" mass). Gravels that move very little when walked on and are hard to dig by hand are obviously difficult for salmonids to construct redds in, and often do not allow sufficient water to pass through the gravel interstices to permit good egg and alevin survival.

Water Flow - Intragravel water flows are only guessed at by field personnel looking at surface water flows, gravel fine content, and gravel compaction. Compacted gravels with large amounts of fines probably have very poor intragravel water flows, likewise gravels located at the bottom of a large deep pool. Conversely, areas with loose, easily worked gravel with little fine material in fast flowing sections of a stream probably have excellent intragravel water flows.

Available Rearing Area ARA:

Record the percent of the active surface area which is ARA. This is a visual estimate that is made to the nearest 5%.

Rearing area is that portion of the active stream channel that contains adequate food and cover for sustaining juvenile salmonids. Good rearing area is most often identified by the presence of low flow velocities and significant amounts of cover such as undercut banks and large stable organic debris, and deepwater areas that juvenile salmonids can overwinter in. Proximity to riffle areas

generally assumed to be food producing areas should also be considered. A shallow water, gravel bottom riffle with little instream cover (remember: depth is cover) exemplifies poor rearing habitat if it is not associated with areas that provide cover.

Record the percent of the active surface area which is pools. This is a visual estimate that is made to the nearest 5%.

A pool is a portion of the active stream channel with water deeper than that within the surrounding areas, and often with reduced current velocity, which is frequently usable by fish for resting and cover. Generally, the water surface gradient is lower (i.e. flatter) over the pool than that of the surrounding water area. The channel bottom at the downstream end of the pool is marked by a negative (i.e. upslope) gradient (Wester Division, American Fisheries Society,. 1985, Bayha and Gabreirsen, 1979).

Mean Pool Depth (P. Depth): Record the mean depth for all pools in the sample site. Use the same measurement units (i.e., feet or meters) used for STREAM GEOMETRY. Record this value to the nearest 0.1 m or 0.1 ft, as appropriate. This measurement is made by determining the mean depth for all pools in the sample site, and then determining the overall mean from these separate means.

Transect Distance: Record the length of the sample site in feet.

Average Key Piece Diameter: Record the modal diameter of the LOD key piece in inches. This size is determined by noting the diameter size class in the LOD Tally which has the greatest number of circled tally marks (see below for explanation).

Average Key Piece Length: Record the modal length of the LOD key piece in feet. This size is determined by noting the length size class in the LOD Tally which

has the greatest number for circled tally marks (see below for explanation)

The LOD tally is a transect count of all large organic debris within the bankfull width of the channel. The transect is conducted over the entire site. The LOD is tallied by average diameter and total length of each piece. Minimum size tallied is 4 inches by 10 feet in length unless it has a root wad attached. Clump association types are defined as follows:

"A": Single piece of LOD

"B": Loose association of debris, independent of the number of pieces, in which the pieces are not colinear in orientation or tightly packed and cemented together by smaller debris.

"C": Debris jam consisting of multiple pieces, generally colinear in orientation, which are usually cemented together by small debris.

"E": Any piece with a root wad attached in which the root wad is acting to anchor or stabilize the debris piece in the channel. If the root wad is not effective in stabilizing the piece, it is not considered an "E" type.

COMMENTS: Record any significant conditions or factors which may affect the data collected, or its interpretation. Observations to be noted include: high rainfall, rising water stage, extensive sedimentation or erosion, extensive blowdown or mass erosion, presence of anadromous fish, presence of possible fish passage barriers, land use conditions other than undisturbed, glacial till exposed in banks or bed, marine sediments

COHO REARING AND SPAWNING HABITAT

ADDITIONS TO THE ADF&G ANADROMOUS WATERS CATALOG IN

MISTY FIORDS NATIONAL MONUMENT WILDERNESS, 1989

Channel typing is a valuable tool for identifying anadromous habitat that may not already be cataloged in the department's Anadromous Waters Catalog. The lower gradient channels and their phases, such as B1, B2, B3, B4, B5, B6, C1, C2, C3, C4, C5, L1, L2, L3, L4, L5, D3, D4, and D5 all contain excellent to fair spawning and rearing habitat. If they are situated below barriers and are below approximately 800 feet in elevation, there is a high probability that anadromous fish will be present.

Using the channel type maps for Misty Fiords, several stream segments were selected that were not cataloged but whose channel types indicated that they contained good habitat. Using minnow traps baited with Betadined salmon eggs, anadromous species in these segments were trapped and positively identified, and the cataloged anadromous habitat was extended accordingly.

ANADROMOUS CATALOG EXTENSIONS

STREAM #	STREAM NAME	EXTENSION
101-30-10090	Weasel Cove Creek	2 Miles
101-15-10190	Tombstone River	2 Miles
101-75-10300	Unuk River, Above Gene's L.	4 Miles
101-11-10370	Nakat Creek	3 Miles
101-23-10180	Very Inlet	2.4 Miles
101-30-10950	Vixen Bay Head	1.6 Miles
	TOTAL:	15 Miles

POSSIBLE ENHANCEMENT SITES
MISTY FIORDS NATIONAL MONUMENT WILDERNESS

VCU 825
Red Creek, 101-55-10830

Channel typing maps indicated that there was good coho rearing habitat above what appeared to be a small barrier on Red Creek, Smeaton Bay. The entire stream was aerially surveyed by helicopter, revealing two small falls, each less that 10 feet high, within 400 to 600 yards of saltwater. Above the barrier there are two miles of C1, 0.5 mile of C2, 0.25 mile of B3 and 0.25 mile of B2 channel types, all good coho rearing habitats. A site was chosen in the C1 and a sample was taken, revealing excellent coho rearing habitat with deep cover pools. With minor manipulation of boulders below the falls, or the creation of a holding pool below the falls, this stream shows a high probability of being a good enhancement site. The close proximity of the barrier to the mouth would make it easily accessible by foot, and relatively inexpensibe to enhance. To calculate the area of additional spawning habitat that would be accessed, the length of new habitat, by channel type, was multiplied by the average active width per channel type taken from Land Use's database. The average available spawning area (ASA) was also pulled from the database, and additional ASA was calculated accordingly. To arrive at numbers of additional salmon that can utilitze the available spawning gravel, calculate at a rate of:

Pink = 1 pair per 1 square meter
Chum = 1 pair per 10 square meters
Coho = 1 pair per 10 square meters

CT	LENGTH	AVERAGE ACTIVE WIDTH	AVAILABLE ACTIVE AREA	% ASA	AVAILABLE ASA/SQUARE METER
C1	10,560'	37.18'	392,621 sq ft	35.4%	12,898 sq m
C2	2,640'	54.10'	142,824 sq ft	7.1%	942 sq m
B3	1,320'	24.93'	32,908 sq ft	22.5%	688 sq m
B2	1,320'	8.08'	10,666 sq ft	25.5%	253 sq m
				TOTAL:	14,781 sq m

Additional Pink Production Potential: 29,562
Additional Chum Production Potential: 2,956
Additional Coho Production Potential: 2,956

POSSIBLE ENHANCEMENT SITES, MISTY FIORDS, Cont.

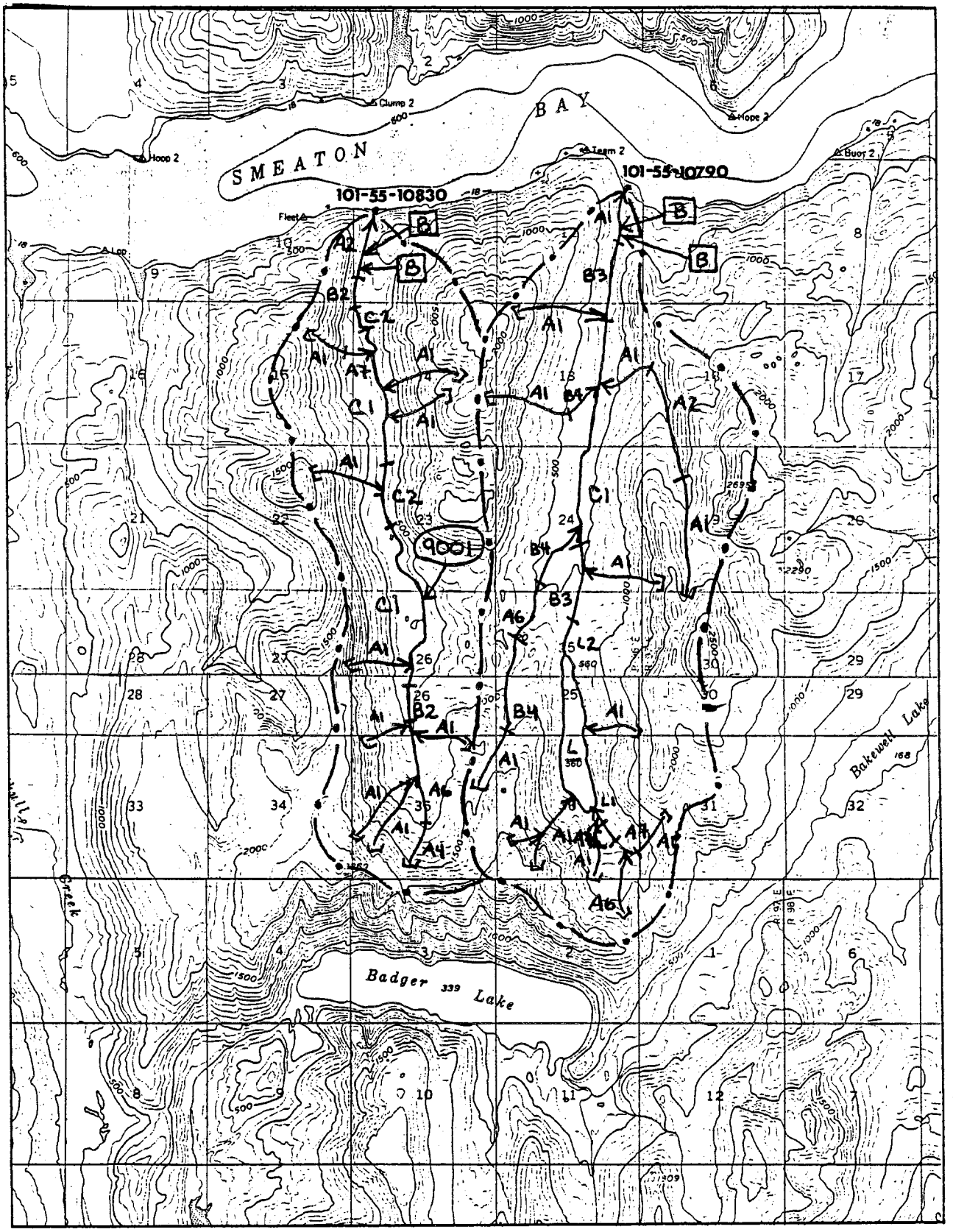
VCU 825
101-55-10790

Channel typing maps also indicated that there was good coho rearing habitat on this stream approximately 1.5 miles East of Red Creek, #101-55-10830. There are several barriers approximately 0.5 miles from saltwater. Unfortunately, we were not able to get a good look at the barriers from the helicopter, but they appear to be larger than those on Red Creek. Reconnaissance by foot is recommended to adequately evaluate these barriers. The same methods are used to calculate the area of additional spawning habitat that would be accessed.

CT	LENGTH	AVERAGE ACTIVE WIDTH	AVAILABLE ACTIVE AREA	% ASA	AVAILABLE ASA/SQUARE METER
C1	7,920'	37.18'	294,466 sq ft	35.4%	9,684 sq m
B3	6,600'	24.93'	164,538 sq ft	22.5%	3,439 sq m
B2	660'	8.08'	5,333 sq ft	25.5%	126 sq m
B4	1,650'	17.29'	28,529 sq ft	4.2%	111 sq m
				TOTAL:	13,360 sq m

Additional Pink Production Potential: 26,720
Additional Chum Production Potential: 2,672
Additional Coho Production Potential: 2,672

MISTY FIORDS MONUMENT ENHANCEMENT SITES



MISTY FIORDS RIPARIAN VEGETATION SURVEYS

Presently there is some discussion on the Tongass as to how to delineate the riparian zone of a stream using vegetation as a primary indicator. In other parts of the country there is generally an obvious demarkation of stream-influenced vegetation, with a band of lush green water-dependent vegetation occuring in an obvious strip along the stream banks, and the dryer, less lush vegetation resuming just a few feet away. However, here in Southeast there is a large amount of water readily available in most parts of the forest. The difficulty arises in distinguishing stream-related from precipitation-related water sources; often this is nearly impossible. At each sample site, standard Plant Association surveys (as defined by the Stikine Area of the Forest Service) were taken from bankfull out 200 feet. While this is a good generalization of basic plant commumities, many of the less abundant species are overlooked. With the objective of cataloging plant species that are growing in close association with the stream, random visual surveys were made of the ground layer of herbacious plants that occured immediately adjacent to the stream and seemed to decrease in numbers or disappear altogether within a relatively short distance from the stream (3 to 15 feet). These plants are listed in order of relative abundance, and do not reflect the relationship between species on different sample sites. They don't reflect the understory plants that were assumed to be accounted for in the Plant Association survey, nor do they reflect the much larger and more complex Sitka Spruce (*Picea sitchensis*) dominated riparian zone.

MISTY FIORDS RIPARIAN VEGETATION BY SAMPLE SITE, JUNE 1989

C3.1
KAARI CK, RIGHT BANK

SCIENTIFIC NAMES	COMMON NAMES
Gramineae	Grass
Thelypteris phegopteris	Beech fern
Cornus canadensis	Bunchberry
Prenanthes alata	Rattlesnake root
Arnica spp.	Arnica

C3.1
KAARI CK, LEFT BANK

SCIENTIFIC NAMES	COMMON NAMES
Athyrium filix-femina	Lady fern
Thelypteris phegopteris	Beech fern
Streptopus amplexifolius	Clasping twisted stalk
Malanthemum dilitatum	Deer berry
Aruncus sylvester	Goats beard
Gramineae	Grass
Cornus canadensis	Bunchberry

C1
GENE'S L. RIGHT BANK

SCIENTIFIC NAMES	COMMON NAMES
Carex sp.	Sedge
Veratrum viride	False hellebore
Athyrium filix-femina	Lady fern
Streptopus roseus	Rosy twisted stalk
Sanguisorba sp.	Burnet
Viola sp.	Violet
Trientalis europea	Starflower
Caltha palustris	Yellow marsh marigold
Circaea alpina	Enchanters nightshade
Prenanthes alata	Rattlesnake root

C1
GENE'S L. LEFT BANK

SCIENTIFIC NAMES	COMMON NAMES
Rubus spectabilis	Salmonberry
Veratrum viride	False hellebore
Viola langsdorfii	Alaska violet
Prenanthes alata	Rattlesnake root
Viburnum edule	Highbush cranberry
Carex sp.	Sedge
Oplopanax horridum	Skunk cabbage

MISTY FIORDS RIPARIAN VEGETATION BY SAMPLE SITE, JUNE 1989 (continued)

C2.7
INDIAN CREEK, RIGHT BANK

SCIENTIFIC NAMES	COMMON NAMES
Thelypteris phagopteris	Beech fern
Viola sp.	Violet
Achillea millefolium	Yarrow
Aquelegia formosa	Western columbine
Vaccinium sp.	Blueberry (Alaska or early)
Oplopanax horridum	Devils club

C2.7
INDIAN CREEK, LEFT BANK

SCIENTIFIC NAMES	COMMON NAMES
Malanthemum dilitatum	Deer berry
Prenanthes alata	Rattlesnake root
Viola sp.	Violet
Streptopus roseus	Rosy twisted stalk
Sanguisorba sp.	Burnet
Oplopanax horridum	Devils club
Caltha palustris	Yellow marsh marigold

C1
VERY INLET, RIGHT BANK

SCIENTIFIC NAMES	COMMON NAMES
Ribes bracteosum	Stink current
Aruncus sylvester	Goats beard
Thelypteris phagopteris	Beech fern
Alnus rubra	Red alder
Athyrium fillix-femina	Lady fern
Carex sp.	Sedge

C1
VERY INLET, LEFT BANK

SCIENTIFIC NAMES	COMMON NAMES
Gymnocarpium dryopteris	Oak fern
Streptopus roseus	Rosy twisted stalk
Thelypteris phagopteris	Beech fern
Athyrium fillix-femina	Lady fern
Oplopanax horridum	Devils club
Vaccinium sp.	Blueberry (Alaska or earl
Menziesia ferruginea	Rusty menziesia

C1
NAKAT CREEK, RIGHT BANK

SCIENTIFIC NAMES	COMMON NAMES
Malanthemum dilitatum	Deer berry
Streptopus roseus	Rosy twisted stalk
Lysichitum americanum	Skunk cabbage
Oplopanax horridum	Devils club
Athyrium fillix-femina	Lady fern
Ribes bracteosum	Stink current

C1
NAKAT CREEK, LEFT BANK

SCIENTIFIC NAMES	COMMON NAMES
Malanthemum dilitatum	Deer berry
Circaea alpina	Enchanters nightshade
Streptopus amplexifolius	Clasping twisted stalk
Sambucus racemosa	Elderberry
Athyrium fillix-femina	Lady fern
Fritillaria camschatcensis	Chocolate lily

MISTY FIORDS RIPARIAN VEGETATION BY SAMPLE SITE, JUNE 1989 (continued)

B2
DUNGENESS CK, RIGHT BANK

SCIENTIFIC NAMES	COMMON NAMES
Rubus pedatus	Five-leaf bramble
Prenanthes alata	Rattlesnake root
Streptopus roseus	Rosy twisted stalk
Lysichitum americanum	Skunk cabbage

B2
DUNGENESS CK, LEFT BANK

SCIENTIFIC NAMES	COMMON NAMES
Coptis trifoliata	Trifoliate goldthread
Gymnocarpium dryopteris	Oak fern
Cornus canadensis	Bunchberry
Prenanthes alata	Rattlesnake root

C1.1
WILSON R., RIGHT BANK

SCIENTIFIC NAMES	COMMON NAMES
Gymnocarpium dryopoteris	Oak fern
Streptopus roseus	Rosy twisted stalk

C1.1
WILSON R., LEFT BANK

SCIENTIFIC NAMES	COMMON NAMES
Viola sp.	Violet (Alaska or marsh)
Arnica sp.	Arnica
Prenanthes alata	Rattlesnake root

C2
ALAVA BAY, RIGHT BANK

SCIENTIFIC NAMES	COMMON NAMES
Streptopus amplexifolius	Clasping twisted stalk
Gymnocarpium dryopteris	Oak fern
Athyrium filix-femina	Lady fern
Viola sp.	Violet (Alaska or marsh)
Prenanthes alata	Rattlesnake root
Ribes bracteosum	Stink current
Alnus rubra	Red alder
Vaccinium sp.	Blueberry (Alaska or early)

C2
ALAVA BAY, LEFT BANK

SCIENTIFIC NAMES	COMMON NAMES
Arnica sp.	Arnica
Prenanthes alata	Rattlesnake root
Saxifraga punctata	Brook saxifrage
Blechnum spicant	Deer fern
Gramineae	Grass
Gymnocarpium dryopteris	Oak fern
Viola sp.	Violet (Alaska or marsh)
Fauria crista-galli	Deer cabbage
Epilobium sp.	Willow weed
Caltha biflora	White marsh marigold
Veratrum viride	False hellebore
Athyrium filix-femina	Lady fern

MISTY FIORDS RIPARIAN VEGETATION BY SAMPLE SITE, JUNE 1989 (continued)

C1
PRINCESS BAY, RIGHT BANK

SCIENTIFIC NAMES	COMMON NAMES
Rubus spectabilis	Salmonberry
Athyrium filix-femina	Lady fern
Alnus rubra	Red alder
Gymnocarpium dryopteris	Oak fern
Blechnum spicant	Deer fern
Oplopanax horridum	Devils club

C1
PRINCESS BAY, LEFT BANK

SCIENTIFIC NAMES	COMMON NAMES
Vaccinium sp.	Blueberry (Alaska or earl
Gymnocarpium dryopteris	Oak fern
Thelypteris phegopteris	Beech fern
Saxifraga punctata	Brook saxifraga

C3
RED RIVER RIGHT BANK

SCIENTIFIC NAMES	COMMON NAMES
TOO SWIFT AND DEEP TO CROSS	

C3
RED RIVER LEFT BANK

SCIENTIFIC NAMES	COMMON NAMES
Rubus spectabilis	Salmonberry
Gymnocarpium dryopteris	Oak fern
Aruncus sylvester	Goats beard
Streptopus amplexifolius	Clasping twisted stalk
Streptopus roseus	Rosy twisted stalk
Viola glabella	Stream violet
Cornus stolonifera	Red osier dogwood
Sambucus racemosa	Elderberry
Viburnum edule	Highbush cranberry
Ribes bracteosum	Stink current

C3.1
KETA RIVER, RIGHT BANK

SCIENTIFIC NAMES	COMMON NAMES
Oplopanax horridum	Devils club
Gymnocarpium dryopteris	Oak fern
Vaccinium sp.	Blueberry (Alaska or early)
Alnus sinuata	Sitka alder

C3.1
KETA RIVER, LEFT BANK

SCIENTIFIC NAMES	COMMON NAMES
Rubus spectabilis	Salmonberry
Gymnocarpium dryopteris	Oak fern
Aruncus sylvester	Goats beard
Streptopus amplexifolius	Clasping twisted stalk
Streptopus roseus	Rosy twisted stalk
Viola glabella	Stream violet
Alnus sinuata	Sitka alder
Urtica sp.	Stinging nettle
Caltha biflora	White marsh marigold

MISTY FIORDS RIPARIAN VEGETATION BY SAMPLE SITE, JUNE 1989 (continued)

C1.4
TOMBSTONE R., RIGHT BANK

SCIENTIFIC NAMES	COMMON NAMES
Carex sp.	Sedge
Menyanthes trifoliata	Bog buckbean
Viola sp.	Violet (Alaska or marsh)
Sanguisorba sp.	Burnet
Spiraea douglasii	Douglas spiraea
Lysichitum americanum	Skunk cabbage
Rubus spectabilis	Salmonberry

C1.4
TOMBSTONE R., LEFT BANK

SCIENTIFIC NAMES	COMMON NAMES
Carex sp.	Sedge
Menyanthes trifoliata	Bog buckbean
Viola sp.	Violet (Alaska or marsh)
Sanguisorba sp.	Burnet
Spiraea douglasii	Douglas spiraea
Lysichitum americanum	Skunk cabbage
Rubus spectabilis	Salmonberry

L3
WEASEL INLET, RIGHT BANK

SCIENTIFIC NAMES	COMMON NAMES
Carex sp.	Sedge
Thelypteris phegopteris	Beech fern
Maianthemum dilitatum	Deer berry

L3
WEASEL INLET, LEFT BANK

SCIENTIFIC NAMES	COMMON NAMES
Prenanthes alata	Rattlesnake root
Blechnum spicant	Deer fern
Maianthemum dilitatum	Deer berry
Athyrium filix-femina	Lady fern
Alnus rubra	Red alder
Rubus spectabilis	Salmonberry
Coptis asplenifolia	Fern-leaf goldthread
Cornus canadensis	Bunchberry
Thelypteris phagopteris	Beech fern
Vaccinium sp.	Blueberry (Alaska or earl
Amelanchier alnifolia	Serviceberry

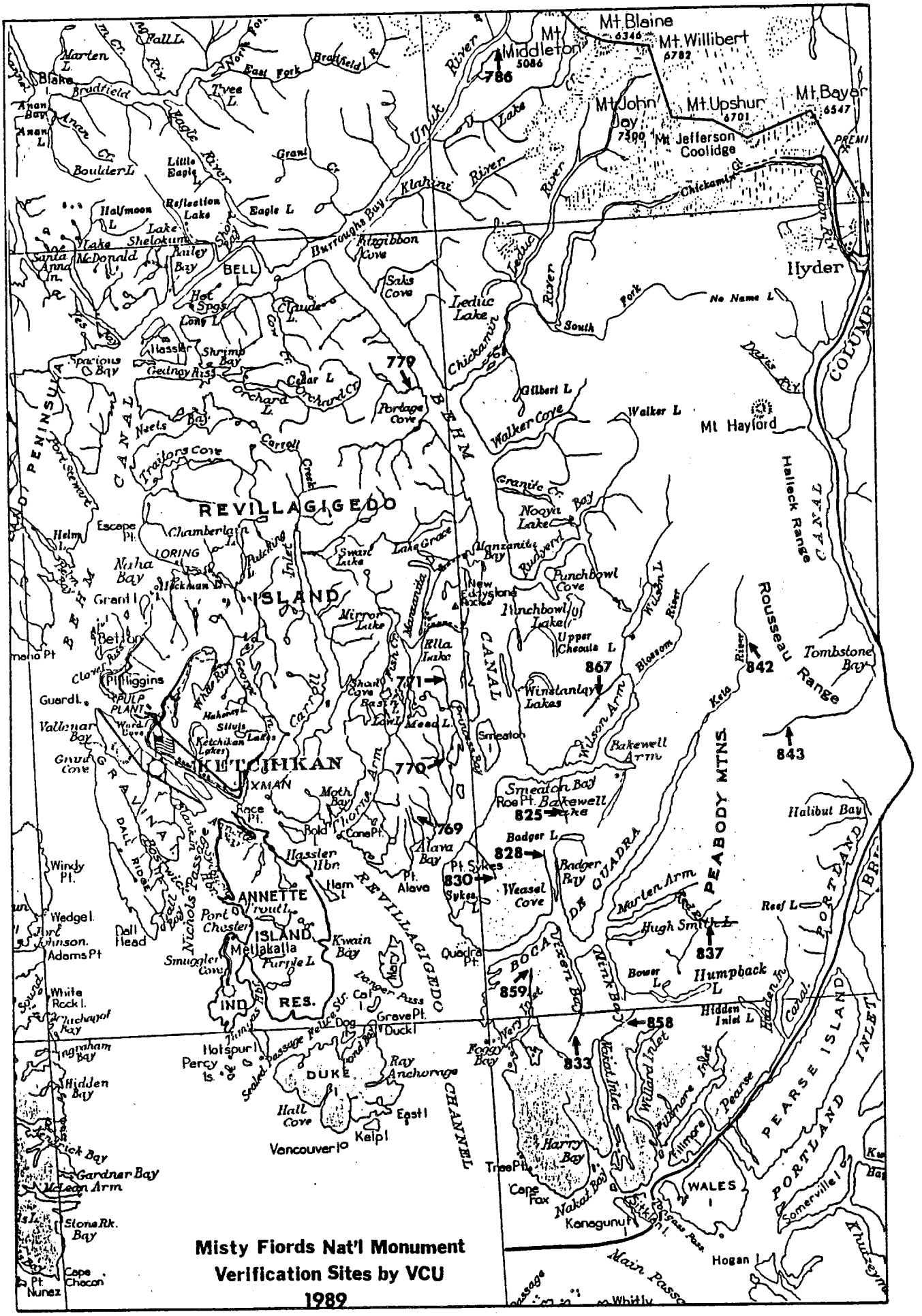
MISTY FIORDS RIPARIAN VEGETATION BY SAMPLE SITE, JUNE 1989 (continued)

C1
RED CREEK, RIGHT BANK

SCIENTIFIC NAMES	COMMON NAMES
Oplopanax horridum	Devils club
Thelypteris phagopteris	Beech fern
Athyrium filix-femina	Lady fern
Gymnocarpium dryopteris	Oak fern
Streptopus roseus	Rosy twisted stalk
Coptis asplenifolia	Fern-leaf goldthread
Rubus pedatus	Five-leaf bramble

C1
RED CREEK, LEFT BANK

SCIENTIFIC NAMES	COMMON NAMES
Viola sp.	Violet (Alaska or marsh)
Prenanthes alata	Rattlesnake root
Streptopus roseus	Rosy twisted stalk
Gymnocarpium dryopteris	Oak fern
Blechnum spicant	Deer fern
Rubus spectabilis	Salmonberry
Viratrum viride	False hellebore
Vaccinium sp.	Blueberry (Alaska or early
Oplopanax horridum	Devils club


Mt. Blaine
6346
Mt. Willibert
6782
Mt. Middleton
5086
786
Mt. John Jay
7300
Mt. Upshur
6701
Mt. Bayer
6547
Mt. Jefferson Coolidge
Hyder
Mt. Hayford
Walker L.
Walker Cove
Gilbert L.
Portage Cove
779
Saks Cove
Burroughs Bay
Klahini River
Unuk River
Chickamin River
Iyedu Lake
Iyedu River
South Fork
No Name L.
Chickamin Cr.
Davis Bay
COLUMBIA
Halleck Range
Rousseau Range
Tombstone Bay
842
843
867
Winstanley Lakes
Blossom River
Wilson Arm
Wilson River
Punchbowl Cove
Punchbowl Lake
Upper Cheoah L.
New Edystone Lake
Manzanita Bay
Nogwa Lake
Granite Cr.
Lake Grace
Smart Lake
Mirror Lake
Ella Inlet
771
Smeaton
Smeaton Bay
Roe Pt.
Bakewell Lake
Bakewell Arm
825
Badger L.
828
Badger Bay
Weasel Cove
Pt. Sykes
830
Sykes L.
Alava Bay
Pt. Alava
769
Quadra Pt.
859
858
833
Halibut Bay
Marten Arm
Hugh Smith L.
837
Bower L.
Humpback L.
Hidden Inlet L.
Reef L.
PEABODY MTNS
DE QUADRA
BOCA
Vixen Bay
Menk Bay
Nakat Inlet
Willard Inlet
Fillmore Inlet
Pearse
PEARSE ISLAND
PORTLAND INLET
PORTLAND
WALES
Somerville I.
Kanagunut
Cape Fox
Tree Pt.
Harry Bay
Nakat Bay
Hogan I.
Main Passage
Whitly
Kete
Keku River
Tuxekan
Nichols Passage
Dall Head
Wedge I.
Windy Pt.
Adams Pt.
White Rock I.
Ingraham Bay
Hidden Bay
Gardner Bay
McLean Arm
Stone Rk. Bay
Cape Chacon
Pt. Nunez
Vancouver I.
Kelp I.
East I.
Hall Cove
Ray Anchorage
DUKE
Percy Is.
Hotspur I.
Snake Passage
Grave Pt.
Duck I.
Dog I.
Sir Cal I.
Danger Pass
Kwain Bay
Quadra Pt.
Smuggler Cove
Metlakatla
Purple L.
Port Chester
ANNETTE ISLAND
IND. RES.
Hassler Hbr.
Hom I.
Bold Cove
Moth Bay
Hassler Pass
Nichols Pass
Dall River
Ketchikan Lakes
Silvis Lake
Ward Cove
Vallenar Bay
Guard I.
Pt. Higgins
PULP PLANT
Clover Pass
Bell I.
Grant I.
Nisha Bay
Loring
Escape Pt.
Helm I.
Chamberlain I.
Pole Ring Inlet
Smart Lake
Lake Grace
Manzanita Bay
Rudyard
Nogwa Lake
Granite Cr.
Walker Cove
Walker L.
Mt. Hayford
Davis Bay
Trailors Cove
Carroll Creek
Nooka Pass
Port Stewart
Neels Bay
Orchard L.
Orchard Cr.
Cedar L.
Claude L.
Cove L.
Hot Spgs.
Shrimp Bay
Hassler
Spacious Bay
Geeting Pass
Burley Bay
Lake Shelokum
McDonald L.
Santa Anna Inlet
Halfmoon L.
Reflection Lake
Eagle L.
Little Eagle L.
Grant Cr.
Boulder L.
Anan Bay
Anan L.
Anan Cr.
Blake I.
Bradfield
Marten L.
Fall L.
Tyee L.
East Fork
Bradfield R.
Eagle River
REVILLAGIGEDO ISLAND
KETCHIKAN
REVILLAGIGEDO CHANNEL
BEHM CANAL
PENINSULA
CANAL
Misty Fiords Nat'l Monument
Verification Sites by VCU
1989

CHANNEL TYPE VERIFICATION CARD

DATE: 89/06/15 VCU: 828 SEG: N/A SITE: 9001 AREA: 05 **********
R.D.: 052 MGT AREA: K43 SUB SEC: 9 1/4 QUAD: KTN-A3-NW *PRELIM CT: B1 *
STREAM: WEASEL COVE HEAD * FINAL CT: L3 *
ADF&G: 101-30-10090- **********
BASIN AREA: sq mi PERCENT LAKE: % PRECIPITATION: in.
SITE ELEVATION: ft. MAXIMUM ELEVATION: ft.
AEROPHOTO (YR/FLT/ROLL/PHOTO): 64/2/ENL/11 GRADIENT: 0.5 %
UPSTREAM PHOTO: 801-18 DOWNSTREAM PHOTO: 801-19 STREAM PATTERN: SINGLE
WATER: 11.0 C. AIR: C. TIME: hrs BANK CONTROL: ALLUVIAL
SITE DISTURBED: N WEATHER: RAIN BANKFULL WIDTH: ft.
ACTIVE WIDTH: ft.
ADJACENT LANDFORM & VEGETATION AVG.POOL DEPTH: ft.
LEFT BANK *RIGHT BANK* # POOLS:
LANDFORM: POOLS: % FISH OBSERVED: Y
CANOPY: ASA: % LIFESTAGE: J
INCISION:(meters) ARA: % IDENTITY:SS,CT,DV

PLANT ASSOCIATION [DIST] * PLANT ASSOCIATION [DIST] TRAP RESULTS
LEFT BANK * *RIGHT BANK* (30 min. set)
* T#1 31SS, 7DV
PA#1: T#2 23SS, 1CT, 5DV
PA#2: T#3 30SS, 3CT, 11DV
PA#3:
PA#4: *SUBSTRATE*
PA#5:

BEDROCK: %
SIDESLOPE LENGTH & ANGLE SM BOULDER: %
LG RUBBLE: %
ft/% ft/% ft/% ft/% ft/% SM RUBBLE: %
R.BANK CRS GRAVEL: %
FINE GRAVEL: %
L.BANK VFG/SAND: %
ORGANIC/SILT: %

STREAM GEOMETRY
BF *LB* **** **** **** **** **** *LB* *BF*
DISTANCE(ft):
BANKFULL DEPTH(ft):
ACTIVE DEPTH(ft): *LEFT* *RIGHT*
THALWAG LOCATION:

L.O.D. TALLEY (DIAMETER)
4 - 6" 6 - 12" 12 - 24" 24 - 36" >36" AVERAGE KEY PIECE
(LENGTH) DIAMETER/LENGTH
< 10 ft
10-25 ft
25-50 ft TRANSECT LENGTH: ft.
50-100 ft CLUMP TALLEY:
>100 ft DEBRIS POOLS:

COMMENTS: Beaver had dammed up the old B1; smaller beaver dams below backing up the water. Added 2 miles to the anadromous catalogue. Trapped for 30 minutes. Didn't take full sample.

CHANNEL TYPE VERIFICATION CARD

```
DATE: 89/06/22  VCU: 830  SEG: N/A   SITE: 9001   AREA: 05   ******************
R.D.: 052  MGT AREA: K43 SUB SEC: 7    1/4 QUAD: KTN-A3-NW   *PRELIM CT: B2    *
STREAM: DUNGENESS CREEK                                      * FINAL CT: B2    *
ADF&G:  101-51-10300-                                        ******************
BASIN AREA:   1.10 sq mi    PERCENT LAKE:   0.0 %    PRECIPITATION:    140 in.
SITE ELEVATION:    300 ft.        MAXIMUM ELEVATION:   1400 ft.
AEROPHOTO (YR/FLT/ROLL/PHOTO): 64/1/ENL/44            GRADIENT:        4.0  %
UPSTREAM PHOTO: 902-14    DOWNSTREAM PHOTO: 902-15    STREAM PATTERN: SINGLE
WATER: 10.0 C.  AIR: 16.0 C.  TIME:       hrs         BANK CONTROL:   ALLUVIUM
SITE DISTURBED: N       WEATHER: HIGH OVERCAST        BANKFULL WIDTH:   7.9 ft.
                                                      ACTIVE WIDTH:     8.5 ft.
              ADJACENT  LANDFORM  &  VEGETATION       AVG.POOL DEPTH:   1.9 ft.
              *LEFT BANK*          *RIGHT BANK*       # POOLS:            3
LANDFORM:          43                   42            POOLS: 30 % FISH OBSERVED: Y
CANOPY:            C5                   C5            ASA:   60 % LIFESTAGE:    J
INCISION:(meters) 1-2                   1-2           ARA:   40 % IDENTITY:CT,DV

       PLANT ASSOCIATION [DIST]   *  PLANT ASSOCIATION [DIST]    TRAP  RESULTS
              *LEFT BANK*         *       *RIGHT BANK*            (60 min. set)
                                  *                              T#1 1CT,1DV
PA#1:              420[40']                 420[30']             T#2 6CT
PA#2:              710[160']                730[100']            T#3 2DV
PA#3:                                       420[70']
PA#4:                                                                *SUBSTRATE*
PA#5:
                                                                  BEDROCK:   0 %
            SIDESLOPE LENGTH & ANGLE                            SM BOULDER:   0 %
                                                                 LG RUBBLE:  10 %
          ft/%    ft/%    ft/%    ft/%    ft/%                   SM RUBBLE:  20 %
R.BANK    30/0  170/30                                          CRS GRAVEL:  30 %
                                                               FINE GRAVEL:  20 %
L.BANK    40/0  160/30                                            VFG/SAND:  15 %
                                                              ORGANIC/SILT:   5 %
                                STREAM    GEOMETRY
                     *BF* *LB* **** **** **** **** **** *LB* *BF*
DISTANCE(ft):         2.6 2.7  3.6  4.6  5.6  6.6  7.6  10.2 10.5
BANKFULL DEPTH(ft): 5.12 8.10 7.90 7.70 7.54 7.27 7.20 6.65 5.79
ACTIVE DEPTH(ft): *LEFT*  1.8 1.55 1.38 1.22 0.92 0.90 0.40 *RIGHT*
THALWAG LOCATION:         AW&THWG                          AW

                    L.O.D.  TALLEY (DIAMETER)
            4 - 6"   6 - 12"   12 - 24"   24 - 36"   >36"  AVERAGE KEY PIECE
(LENGTH)                                                      DIAMETER/LENGTH
<  10    ft                                                        6     15
10-25    ft  A1,B1,E1  A1,B1,E1
25-50    ft                                                 TRANSECT LENGTH: 150 ft
50-100   ft                                                 CLUMP TALLEY:B2, E2
>100     ft                                                 DEBRIS POOLS:A1,B1,E1

COMMENTS: Red ceder dominates in 710 and 720 PA'S.  Salal and Pengulcula present.
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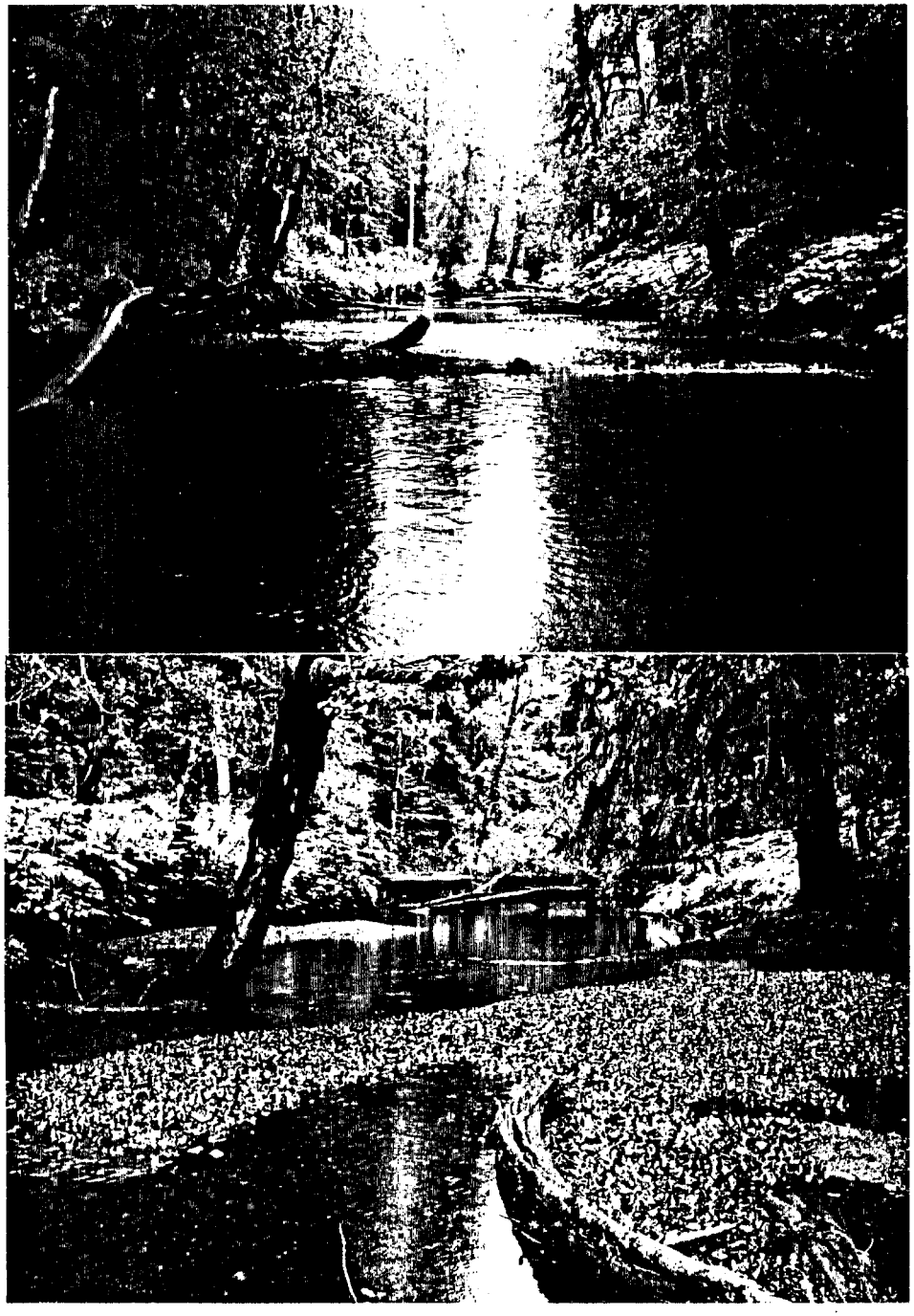


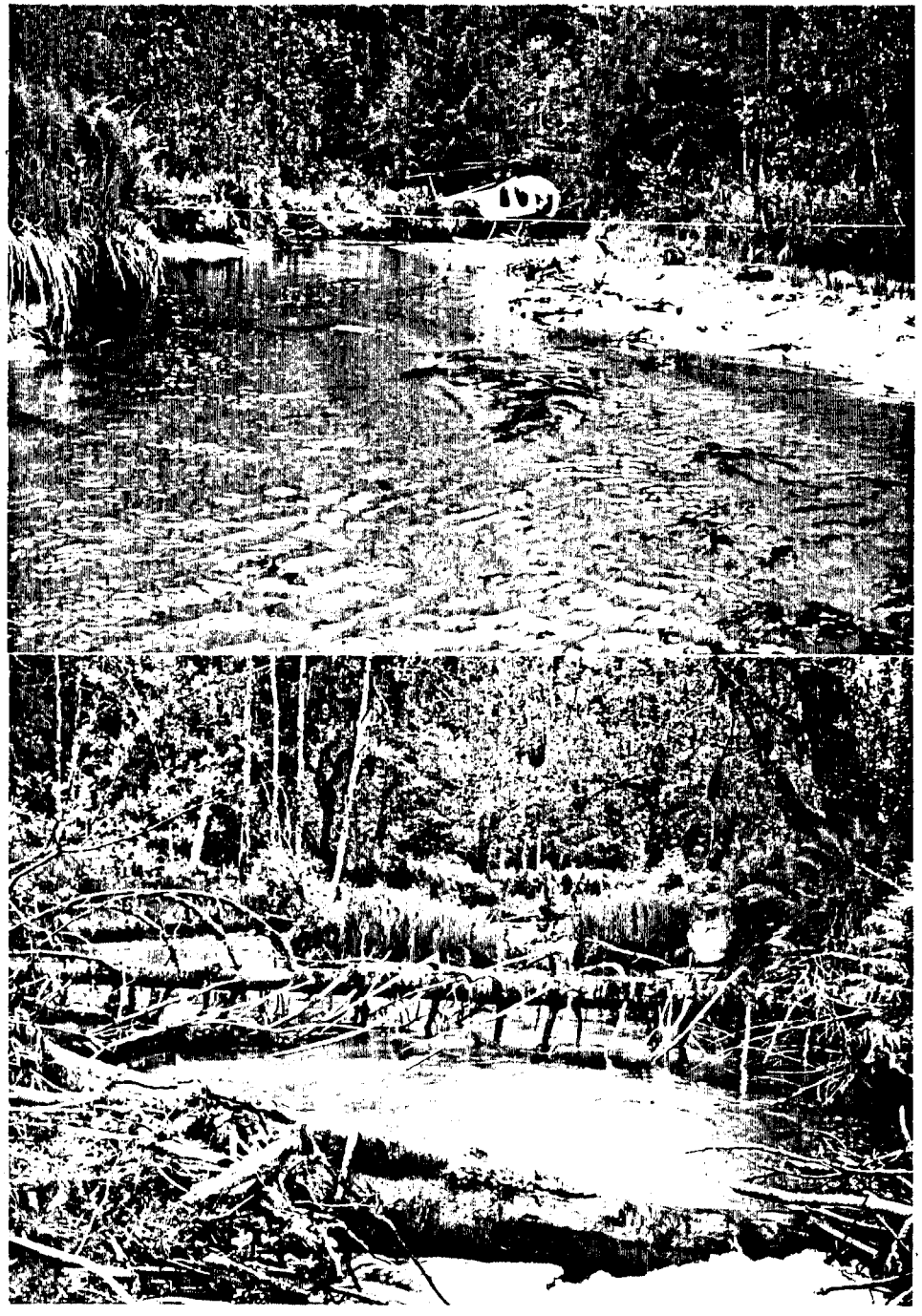
CHANNEL TYPE VERIFICATION CARD

```
DATE: 89/06/13  VCU: 771  SEG: N/A   SITE: 9001   AREA: 05   ******************
R.D.: 052  MGT AREA: K43 SUB SEC: 7    1/4 QUAD: KTN-B4-NE   *PRELIM CT: C1    *
STREAM: PRINCESS BAY                                         * FINAL CT: C1    *
ADF&G:  101-51-10780-                                        ******************
BASIN AREA:   5.00 sq mi    PERCENT LAKE:   0.0 %    PRECIPITATION:    130 in.
SITE ELEVATION:    175 ft.        MAXIMUM ELEVATION:   2500 ft.
AEROPHOTO (YR/FLT/ROLL/PHOTO): 59/2/EFG/105            GRADIENT:         1.0  %
UPSTREAM PHOTO: 901-7     DOWNSTREAM PHOTO: 901-8      STREAM PATTERN: SINGLE
WATER: 11.5 C.  AIR: 15.0 C.  TIME:       hrs          BANK CONTROL:   ALLUVIUM
SITE DISTURBED: N       WEATHER: RAIN                  BANKFULL WIDTH:  69.3 ft.
                                                       ACTIVE WIDTH:    48.1 ft.
              ADJACENT  LANDFORM  &  VEGETATION        AVG.POOL DEPTH:   2.4 ft.
              *LEFT BANK*          *RIGHT BANK*        # POOLS:            9
LANDFORM:          53                   53             POOLS: 40 % FISH OBSERVED: Y
CANOPY:            C6                   C4             ASA:   20 % LIFESTAGE:    J
INCISION:(meters) 1-2                   1-2            ARA:   40 % IDENTITY:CT,DV

        PLANT ASSOCIATION [DIST]   *  PLANT ASSOCIATION [DIST]    TRAP  RESULTS
                *LEFT BANK*        *       *RIGHT BANK*            (60 min. set)
                                   *                              T#1 23CT,5DV
PA#1:               320[30']               352[25']               T#2 15CT,2DV
PA#2:               340[20']               220[175']              T#3 20CT,1DV
PA#3:               110[150']
PA#4:                                                                *SUBSTRATE*
PA#5:
                                                                  BEDROCK:   0 %
            SIDESLOPE LENGTH & ANGLE                            SM BOULDER:   0 %
                                                                 LG RUBBLE:   0 %
          ft/%    ft/%    ft/%    ft/%    ft/%                   SM RUBBLE:  30 %
R.BANK    50/0  150/0                                            CRS GRAVEL:  30 %
                                                                FINE GRAVEL:  15 %
L.BANK    40/15  20/-5 140/0                                       VFG/SAND:  15 %
                                                              ORGANIC/SILT:  10 %
                                   STREAM    GEOMETRY
                 *BF* *LB* **** **** **** **** **** *LB* *BF*
DISTANCE(ft):     1.3  1.4 12.0 23.0 34.0 45.0 49.5 69.3 70.6
BANKFULL DEPTH(ft):  1.3 4.63 6.09 6.12 5.57 5.65 4.71 4.20 3.00
ACTIVE DEPTH(ft): *LEFT*      1.65 1.50 1.11 1.04          *RIGHT*
THALWAG LOCATION:         AW       THWG            AW

                   L.O.D.  TALLEY (DIAMETER)
            4 - 6"   6 - 12"   12 - 24"   24 - 36"   >36"  AVERAGE KEY PIECE
(LENGTH)                                                     DIAMETER/LENGTH
<  10    ft                      A1,E1                          24      25
10-25    ft           B1,C1,E1  A3,B3,C1,E2
25-50    ft                      C1,E1     C1,E1            TRANSECT LENGTH: 200 ft.
50-100   ft                                A1,B1  B1,C1,E2 CLUMP TALLEY:B3,C1,E4
>100     ft                                                 DEBRIS POOLS:A1,B3,C4,E4

COMMENTS: Lots of small LOD wedged into the CE's.
```



CHANNEL TYPE VERIFICATION CARD

```
DATE: 89/06/20  VCU: 786  SEG: N/A   SITE: 9001   AREA: 05   ******************
R.D.: 052  MGT AREA: K43 SUB SEC: 9    1/4 QUAD: BRC-A3-NW   *PRELIM CT: N/A   *
STREAM: UNUK R., ABOVE GENE'S L.                             * FINAL CT: C1    *
ADF&G:  101-75-10300-2022-0010-                              ******************
BASIN AREA:   3.00 sq mi    PERCENT LAKE:   1.0 %    PRECIPITATION:    160 in.
SITE ELEVATION:    450 ft.        MAXIMUM ELEVATION:   5230 ft.
AEROPHOTO (YR/FLT/ROLL/PHOTO): N/A                    GRADIENT:         1.5  %
UPSTREAM PHOTO: 902-02    DOWNSTREAM PHOTO: 902-03    STREAM PATTERN: SINGLE
WATER:  7.0 C.  AIR: 16.0 C.  TIME:        hrs        BANK CONTROL:   ALLUVIUM
SITE DISTURBED: N       WEATHER: HIGH OVERCAST         BANKFULL WIDTH:  48.0 ft.
                                                       ACTIVE WIDTH:    22.7 ft.
            ADJACENT  LANDFORM  &  VEGETATION          AVG.POOL DEPTH:   2.2 ft.
            *LEFT BANK*          *RIGHT BANK*          # POOLS:            6
LANDFORM:          53                 53               POOLS: 35 % FISH OBSERVED: Y
CANOPY:            C6                 C6               ASA:   20 % LIFESTAGE:    J
INCISION:(meters) <1                  <1               ARA:   40 % IDENTITY:SS

       PLANT ASSOCIATION [DIST]   *  PLANT ASSOCIATION [DIST]    TRAP  RESULTS
              *LEFT BANK*         *       *RIGHT BANK*           (60 min. set)
                                  *                             T#1 15SS
PA#1: 01-0-20%35-U-70%51-G-50%[100] 1-0-40%35-U-20%51-G-40%[200] T#2 0
PA#2:                410[100']                                   T#3 0
PA#3:
PA#4:                                                                *SUBSTRATE*
PA#5:
                                                                  BEDROCK:   0 %
           SIDESLOPE LENGTH & ANGLE                            SM BOULDER:   0 %
                                                                LG RUBBLE:   0 %
          ft/%    ft/%    ft/%    ft/%    ft/%                  SM RUBBLE:   5 %
R.BANK    200/0                                               CRS GRAVEL:  10 %
                                                             FINE GRAVEL:  45 %
L.BANK    100/0  100/40                                        VFG/SAND:  40 %
                                                            ORGANIC/SILT:   0 %
                                  STREAM    GEOMETRY
                     *BF* *LB* **** **** **** **** **** *LB* *BF*
DISTANCE(ft):         3.0  5.2 12.0 27.7 33.0 42.0 48.7 50.4 51.0
BANKFULL DEPTH(ft):   0.9 2.86 2.78 3.62 3.94 4.08 5.18 4.64  0.7
ACTIVE DEPTH(ft): *LEFT*                0.40 0.60 1.66  1.1 *RIGHT*
THALWAG LOCATION:                     AW            THWG   AW

                    L.O.D.  TALLEY (DIAMETER)
            4 - 6"   6 - 12"   12 - 24"   24 - 36"   >36"  AVERAGE KEY PIECE
(LENGTH)                                                      DIAMETER/LENGTH
<  10    ft                                                       12     25
10-25    ft            A2,C1,E1       A2
25-50    ft              C1,E1                                 TRANSECT LENGTH: 300 ft
50-100   ft                                                    CLUMP TALLEY:C1,E1
>100     ft                                                    DEBRIS POOLS:A3,C1,E1

COMMENTS: Wolf, beaver, moose sign.  Lots of coho emergents, 10 and 12 by traps 1
          and 2 respectively.  Caught an 11 in. cutthroat.  One CE clump is a
          blown-out beaver dam with lots of debris too small to record.
```

CHANNEL TYPE VERIFICATION CARD

DATE: 89/06/15 VCU: 825 SEG: N/A SITE: 9001 AREA: 05
R.D.: 052 MGT AREA: K43 SUB SEC: 9 1/4 QUAD: KTN-B3-SE
STREAM: RED CREEK
ADF&G: 101-55-10830

```
*******************
*PRELIM CT: C1    *
* FINAL CT: C1    *
*******************
```

BASIN AREA: 1.90 sq mi PERCENT LAKE: 0.0 % PRECIPITATION: 120 in.
SITE ELEVATION: 350 ft. MAXIMUM ELEVATION: 2869 ft.
AEROPHOTO (YR/FLT/ROLL/PHOTO): 64/2/ENL/98
UPSTREAM PHOTO: 901-16 DOWNSTREAM PHOTO: 901-17
WATER: 9.0 C. AIR: 10.0 C. TIME: hrs
SITE DISTURBED: N WEATHER: LIGHT RAIN

GRADIENT: 0.5 %
STREAM PATTERN: SINGLE
BANK CONTROL: ALLUVIUM
BANKFULL WIDTH: 32.6 ft.
ACTIVE WIDTH: 26.0 ft.
AVG.POOL DEPTH: 3.5 ft.
POOLS: 3
POOLS: 75 % FISH OBSERVED: Y
ASA: 10 % LIFESTAGE: J
ARA: 60 % IDENTITY:CT,DV

ADJACENT LANDFORM & VEGETATION

	LEFT BANK	*RIGHT BANK*
LANDFORM:	53	53
CANOPY:	C6	C6
INCISION:(meters)	<1	1-2

	PLANT ASSOCIATION [DIST] *LEFT BANK*	PLANT ASSOCIATION [DIST] *RIGHT BANK*
PA#1:	420[150']	320[35']
PA#2:	610[50']	340[165']
PA#3:		
PA#4:		
PA#5:		

TRAP RESULTS
(60 min. set)
T#1 15CT, 4DV
T#2 3CT,1DV
T#3 0

SIDESLOPE LENGTH & ANGLE

	ft/%	ft/%	ft/%	ft/%	ft/%
R.BANK	200/0				
L.BANK	200/0				

SUBSTRATE

BEDROCK:	0 %
SM BOULDER:	0 %
LG RUBBLE:	0 %
SM RUBBLE:	0 %
CRS GRAVEL:	30 %
FINE GRAVEL:	30 %
VFG/SAND:	30 %
ORGANIC/SILT:	10 %

STREAM GEOMETRY

	BF	*LB*	****	****	****	****	****	*LB*	*BF*
DISTANCE(ft):	36.0	30.0	28.0	22.0	16.0	14.2	10.0	4.0	3.4
BANKFULL DEPTH(ft):	3.2	4.66	5.46	6.28	6.50	6.54	5.96	5.66	2.70
ACTIVE DEPTH(ft):	*LEFT*		0.88	1.74	2.00	2.02	1.45	1.06	*RIGHT*
THALWAG LOCATION:		AW				THWG		AW	

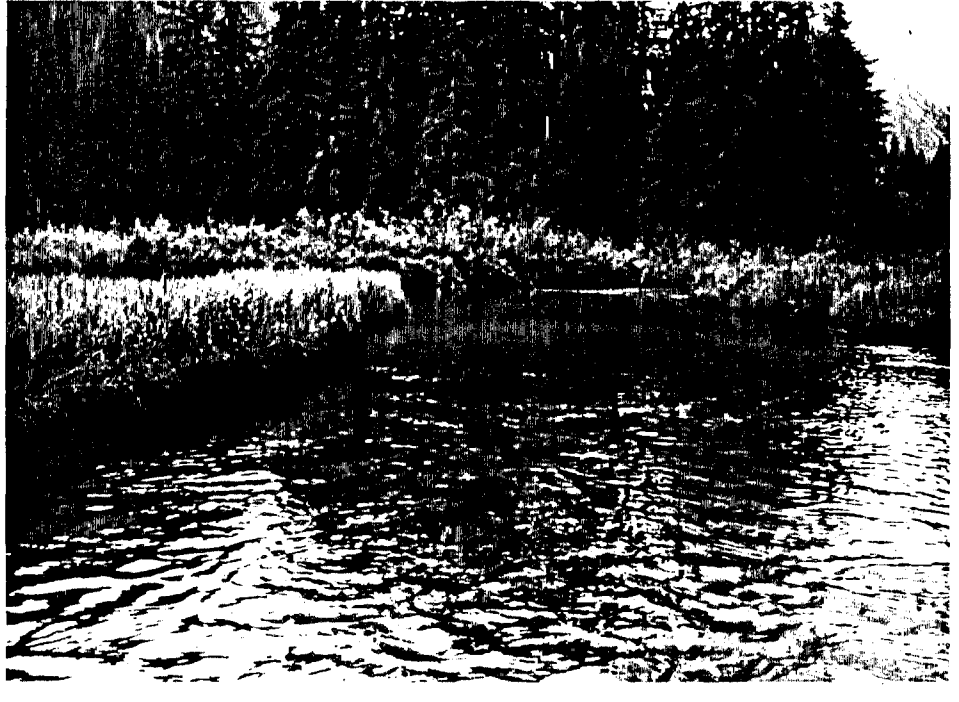
L.O.D. TALLEY (DIAMETER)

(LENGTH)	4 - 6"	6 - 12"	12 - 24"	24 - 36"	>36"
< 10 ft		C1,E1	C2,E2		A1,E1
10-25 ft		A2		C2,E2	
25-50 ft					
50-100 ft					C1,E1
>100 ft					

AVERAGE KEY PIECE
DIAMETER/LENGTH
36 100

TRANSECT LENGTH: 300 ft.
CLUMP TALLEY:C6,E6
DEBRIS POOLS:A1,C3,E3

COMMENTS: Good site for a coho plant above. Several small rearing side channels, old beaver runs too small to map. One 6" CT caught. Lots of old beaver sign.



CHANNEL TYPE VERIFICATION CARD

DATE: 89/06/14 VCU: 843 SEG: N/A SITE: 9001 AREA: 05
R.D.: 052 MGT AREA: K43 SUB SEC: 9 1/4 QUAD: KTN-B1-SW
STREAM: TOMBSTONE RIVER
ADF&G: 101-15-10190-1020-

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*******************
*PRELIM CT: C1.4  *
* FINAL CT: C1.4  *
*******************
```

BASIN AREA: 6.40 sq mi PERCENT LAKE: 0.5 % PRECIPITATION: 190 in.
SITE ELEVATION: 350 ft. MAXIMUM ELEVATION: 4870 ft.
AEROPHOTO (YR/FLT/ROLL/PHOTO): 65/12/ENL/62 GRADIENT: 0.5 %
UPSTREAM PHOTO: 901-11 DOWNSTREAM PHOTO: 901-12 STREAM PATTERN: SINGLE
WATER: 6.0 C. AIR: 15.0 C. TIME: hrs BANK CONTROL: ALLUVIUM
SITE DISTURBED: N WEATHER: HIGH OVERCAST BANKFULL WIDTH: 27.1 ft.
ACTIVE WIDTH: 25.3 ft.
AVG.POOL DEPTH: 2.5 ft.
POOLS: 2
POOLS: 15 % FISH OBSERVED: Y
ASA: 5 % LIFESTAGE: J
ARA: 35 % IDENTITY:SS,DV

ADJACENT LANDFORM & VEGETATION

	LEFT BANK	*RIGHT BANK*
LANDFORM:	53	53
CANOPY:	15	15
INCISION:(meters)	<1	<1

	PLANT ASSOCIATION [DIST] *LEFT BANK*	PLANT ASSOCIATION [DIST] *RIGHT BANK*
PA#1:	15[200']	15[75']
PA#2:		510[125']
PA#3:		
PA#4:		
PA#5:		

TRAP RESULTS (60 min. set)
T#1 11SS,2DV
T#2 1DV
T#3 1DV

SUBSTRATE

BEDROCK:	0 %
SM BOULDER:	0 %
LG RUBBLE:	0 %
SM RUBBLE:	0 %
CRS GRAVEL:	10 %
FINE GRAVEL:	30 %
VFG/SAND:	60 %
ORGANIC/SILT:	0 %

SIDESLOPE LENGTH & ANGLE

	ft/%	ft/%	ft/%	ft/%	ft/%
R.BANK	75/0	125/50			
L.BANK	200/0				

STREAM GEOMETRY

	BF	*LB*	****	****	****	****	****	*LB*	*BF*
DISTANCE(ft):	8.9	9.5	14.5	19.5	24.5	28.8	29.5	34.8	35.1
BANKFULL DEPTH(ft):	4.35	7.14	6.70	6.42	6.65	7.30	7.20	7.40	4.50
ACTIVE DEPTH(ft):	*LEFT*	1.95	1.48	1.08	1.30	1.85	1.85	1.90	*RIGHT*
THALWAG LOCATION:		AW				THWG		AW	

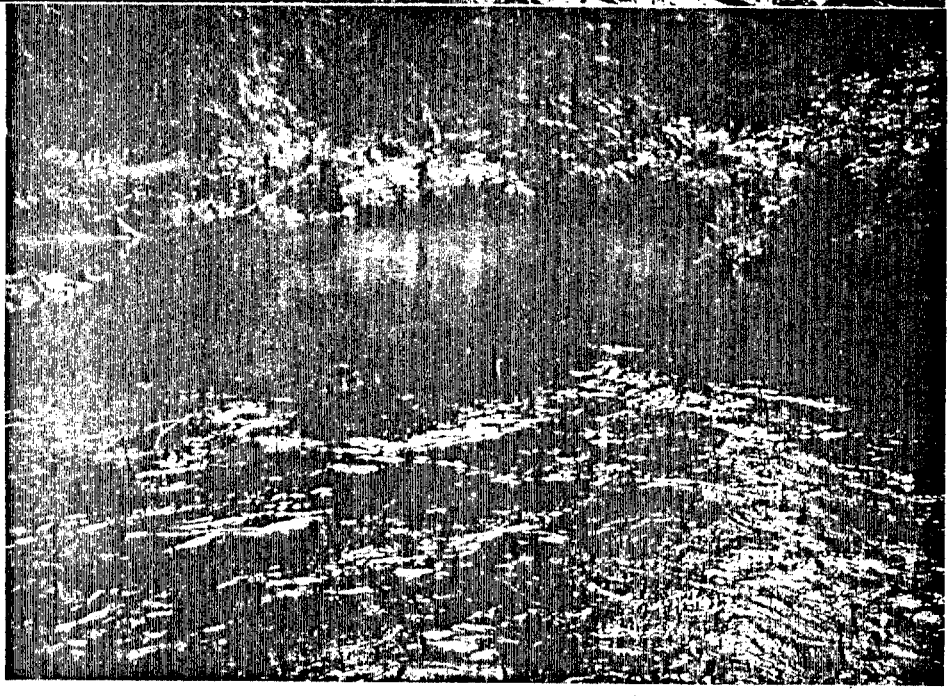
L.O.D. TALLEY (DIAMETER)

(LENGTH)	4 - 6"	6 - 12"	12 - 24"	24 - 36"	>36"
< 10 ft					
10-25 ft					
25-50 ft					
50-100 ft					
>100 ft					

AVERAGE KEY PIECE DIAMETER/LENGTH

TRANSECT LENGTH: 100 ft.
CLUMP TALLEY:
DEBRIS POOLS:

COMMENTS: Chum reported to spawn upstream. Trap with SS was in 10 deg. backwater. Pools caused by two beaver dams, about 100 feet apart. A fringe of Douglas spirea, and a few salmonberry and skunk cabbage were present.



CHANNEL TYPE VERIFICATION CARD

DATE: 89/06/21 VCU: 858 SEG: N/A SITE: 9001 AREA: 05
R.D.: 052 MGT AREA: K43 SUB SEC: 8 1/4 QUAD: PRT-D3-NE
STREAM: NAKAT CREEK
ADF&G: 101-11-10370-
BASIN AREA: 4.50 sq mi PERCENT LAKE: 0.0 % PRECIPITATION: 180 in.
SITE ELEVATION: 75 ft. MAXIMUM ELEVATION: 2956 ft.
AEROPHOTO (YR/FLT/ROLL/PHOTO): 64/2/ENL/270 GRADIENT: 0.5 %
UPSTREAM PHOTO: 902-11 DOWNSTREAM PHOTO: 902-12 STREAM PATTERN: SINGLE
WATER: 9.0 C. AIR: 16.0 C. TIME: hrs BANK CONTROL: ALLUVIUM
SITE DISTURBED: N WEATHER: LIGHT RAIN BANKFULL WIDTH: 29.6 ft.
ACTIVE WIDTH: 25.6 ft.
AVG.POOL DEPTH: 2.0 ft.
POOLS: 8
POOLS: 40 % FISH OBSERVED: Y
ASA: 30 % LIFESTAGE: J
ARA: 40 % IDENTITY:SS,CT,DV

****
*PRELIM CT: C1 *
* FINAL CT: C1 *
****

ADJACENT LANDFORM & VEGETATION

	LEFT BANK	*RIGHT BANK*
LANDFORM:	53	53
CANOPY:	C6	C6
INCISION:(meters)	1-2	1-2

PLANT ASSOCIATION [DIST]

	LEFT BANK	*	*RIGHT BANK*
PA#1:	340[50']	*	340[200']
PA#2:	370[150']	*	
PA#3:		*	
PA#4:			
PA#5:			

TRAP RESULTS
(60 min. set)
T#1 33SS,5ST,3CT,1
T#2 31SS,1ST,12DV
T#3 1ST, 1DV

SUBSTRATE

BEDROCK:	0 %
SM BOULDER:	0 %
LG RUBBLE:	0 %
SM RUBBLE:	5 %
CRS GRAVEL:	30 %
FINE GRAVEL:	30 %
VFG/SAND:	30 %
ORGANIC/SILT:	5 %

SIDESLOPE LENGTH & ANGLE

	ft/%	ft/%	ft/%	ft/%	ft/%
R.BANK	200/0				
L.BANK	200/0				

STREAM GEOMETRY

	BF	*LB*	****	****	****	****	****	*LB*	*BF*
DISTANCE(ft):	29.6	25.7	25.0	20.0	15.0	10.0	5.0	0.07	0
BANKFULL DEPTH(ft):	2.7	3.32	3.60	4.40	4.10	3.55	4.65	3.30	2.30
ACTIVE DEPTH(ft):	*LEFT*		0.03	1.21	1.00	0.52	1.60		*RIGHT*
THALWAG LOCATION:		AW			THWG			AW	

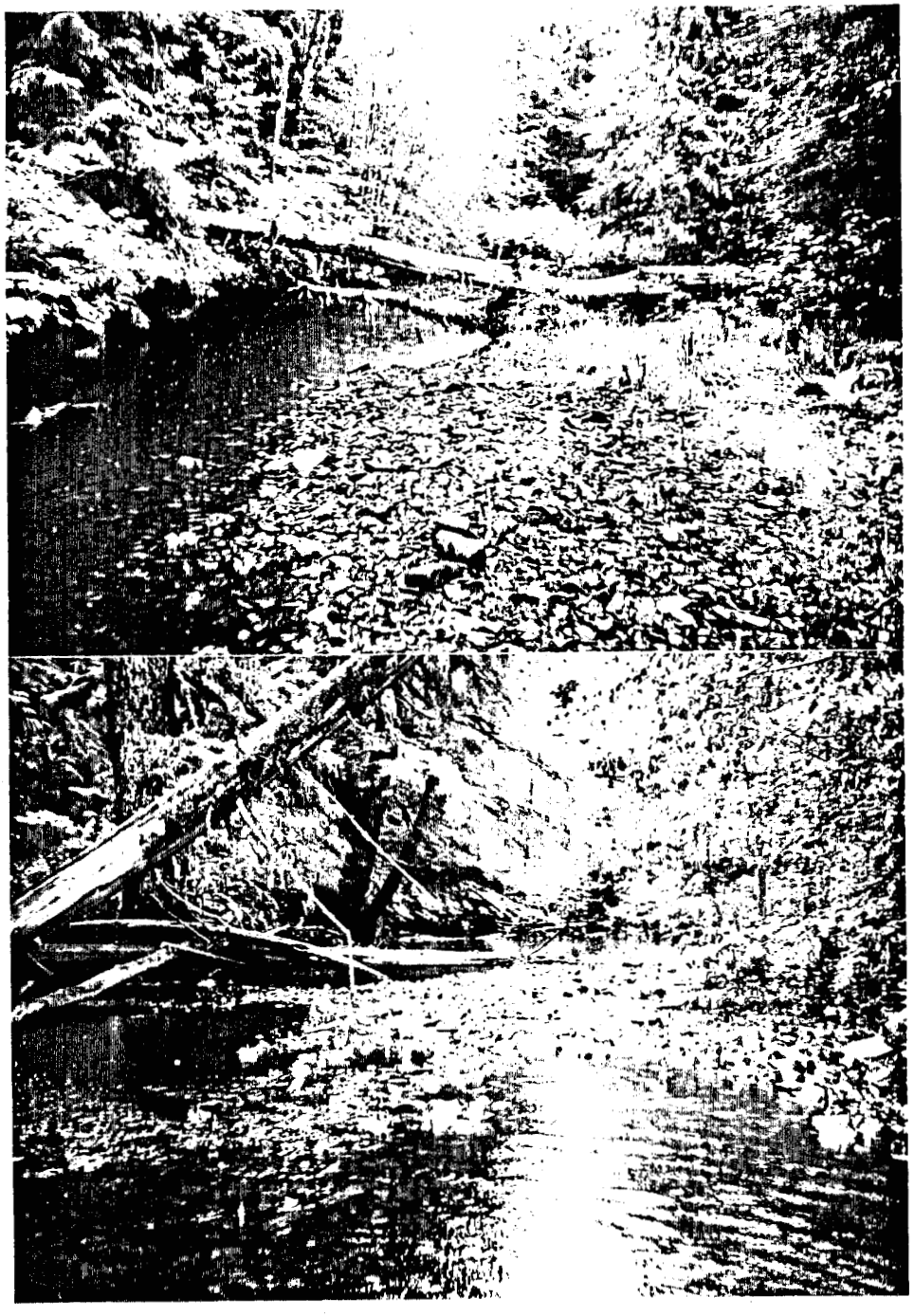
L.O.D. TALLEY (DIAMETER)

(LENGTH)	4 - 6"	6 - 12"	12 - 24"	24 - 36"	>36"
< 10 ft					A1,E1
10-25 ft		A1,B1,C2,E2	C3,E3		A2,C1,E3
25-50 ft		A1			
50-100 ft			C2,E2		B1,C1,E1
>100 ft					

AVERAGE KEY PIECE
DIAMETER/LENGTH
24 25

TRANSECT LENGTH: 100 ft
CLUMP TALLEY:B1,C1,E2
DEBRIS POOLS:A3,B1,C1,E

COMMENTS: Young of year coho present.



CHANNEL TYPE VERIFICATION CARD

DATE: 89/06/20 VCU: 859 SEG: N/A SITE: 9001 AREA: 05
R.D.: 052 MGT AREA: K43 SUB SEC: 7 1/4 QUAD: KTN-A3-SW
STREAM: VERY INLET
ADF&G: 101-23-10180-
BASIN AREA: 3.40 sq mi PERCENT LAKE: 1.8 % PRECIPITATION: 140 in.
SITE ELEVATION: 175 ft. MAXIMUM ELEVATION: 2228 ft.
AEROPHOTO (YR/FLT/ROLL/PHOTO): 64/1/ENL/101
UPSTREAM PHOTO: 902-6 DOWNSTREAM PHOTO: 902-7
WATER: 12.0 C. AIR: 13.0 C. TIME: hrs
SITE DISTURBED: N WEATHER: RAIN

****
*PRELIM CT: C1 *
* FINAL CT: C1 *
****

GRADIENT: 1.0 %
STREAM PATTERN: SINGLE
BANK CONTROL: ALLUVIUM
BANKFULL WIDTH: 39.0 ft.
ACTIVE WIDTH: 20.5 ft.
AVG.POOL DEPTH: 2.0 ft.
POOLS: 5
POOLS: 50 % FISH OBSERVED: Y
ASA: 25 % LIFESTAGE: J
ARA: 50 % IDENTITY:SS, CT,

ADJACENT LANDFORM & VEGETATION

	LEFT BANK	*RIGHT BANK*
LANDFORM:	53	53
CANOPY:	C4	C4
INCISION:(meters)	<1	<1

	PLANT ASSOCIATION [DIST] *LEFT BANK*	PLANT ASSOCIATION [DIST] *RIGHT BANK*
PA#1:	410[15']	340[25']
PA#2:	430[185']	420[175']
PA#3:		
PA#4:		
PA#5:		

TRAP RESULTS
(60 min. set)
T#1 1SS, 6CT, 5DV
T#2 5SS, 10CT, 7DV
T#3 1SS, 22CI, 10D

SIDESLOPE LENGTH & ANGLE

	ft/%	ft/%	ft/%	ft/%	ft/%
R.BANK	200/0				
L.BANK	200/0				

SUBSTRATE

BEDROCK:	0 %
SM BOULDER:	0 %
LG RUBBLE:	35 %
SM RUBBLE:	35 %
CRS GRAVEL:	20 %
FINE GRAVEL:	10 %
VFG/SAND:	0 %
ORGANIC/SILT:	0 %

STREAM GEOMETRY

	BF	*LB*	****	****	****	****	****	*LB*	*BF*
DISTANCE(ft):	42.0	41.5	31.0	25.0	24.0	17.0	10.0	4.5	3.0
BANKFULL DEPTH(ft):	3.0	5.0	3.83	4.0	4.4	4.9	5.13	4.7	3.7
ACTIVE DEPTH(ft): *LEFT*	0.4				0.48	0.84	0.82		*RIGHT*
THALWAG LOCATION:				AW			THWG	AW	

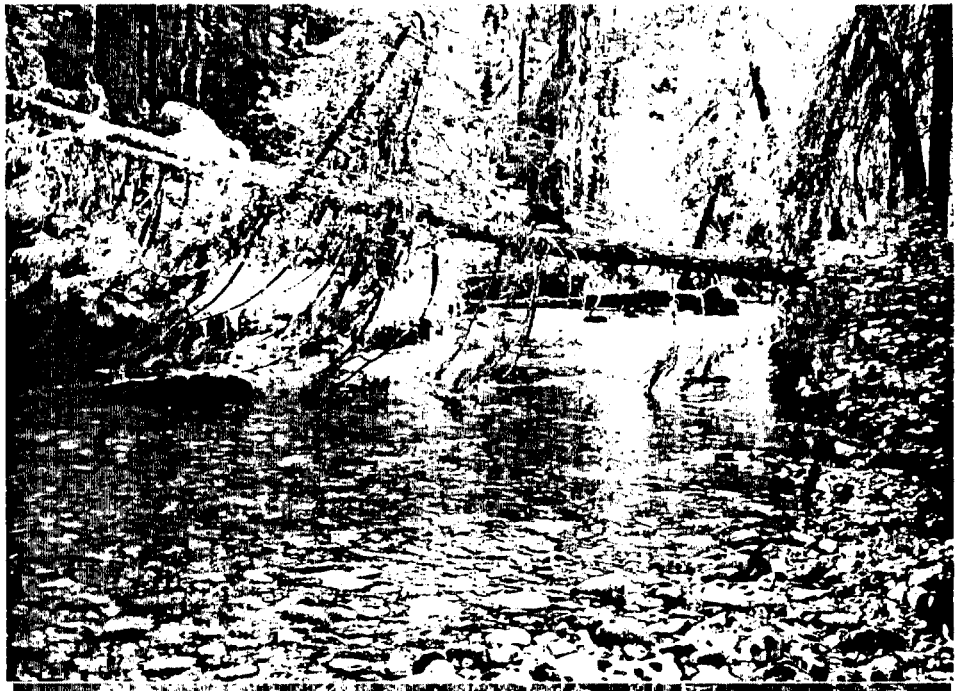
L.O.D. TALLEY (DIAMETER)

(LENGTH)	4 - 6"	6 - 12"	12 - 24"	24 - 36"	>36"
< 10 ft					
10-25 ft	C1,E1	B1,C4,E4	A1,C2,E3	C1,E1	A1,B1,E1
25-50 ft					
50-100 ft			C3,E3		
>100 ft					

AVERAGE KEY PIECE
DIAMETER/LENGTH
12 50

TRANSECT LENGTH: 100 ft
CLUMP TALLEY:B1,C2,E3
C1,E1 DEBRIS POOLS:A1,B1,C2,E

COMMENTS: No mountain hemlock in mixed conifer series. Nice monark spruce next to stream. Tree sized alder along bank.



CHANNEL TYPE VERIFICATION CARD

DATE: 89/06/22 VCU: 867 SEG: N/A SITE: 9001 AREA: 05
R.D.: 052 MGT AREA: K43 SUB SEC: 9 1/4 QUAD: KTN-B3-NE
STREAM: WILSON RIVER
ADF&G: 101-55-10200-2003

```
*******************
*PRELIM CT: C2    *
* FINAL CT: C1.1  *
*******************
```

BASIN AREA: 5.70 sq mi PERCENT LAKE: 0.0 % PRECIPITATION: 160 in.
SITE ELEVATION: 350 ft. MAXIMUM ELEVATION: 3255 ft.
AEROPHOTO (YR/FLT/ROLL/PHOTO): 65/10/ENL/32
UPSTREAM PHOTO: 902-19 DOWNSTREAM PHOTO: 902-20
WATER: 9.0 C. AIR: 19.0 C. TIME: hrs
SITE DISTURBED: N WEATHER: HIGH OVERCAST

GRADIENT: 1.5 %
STREAM PATTERN: SINGLE
BANK CONTROL: MIXED
BANKFULL WIDTH: 39.0 ft.
ACTIVE WIDTH: 29.1 ft.
AVG.POOL DEPTH: 2.0 ft.
POOLS: 4
POOLS: 5 % FISH OBSERVED: Y
ASA: 30 % LIFESTAGE: J
ARA: 10 % IDENTITY:DV

ADJACENT LANDFORM & VEGETATION

	LEFT BANK	*RIGHT BANK*
LANDFORM:	53	53
CANOPY:	C4	C4
INCISION:(meters)	<1	<1

PLANT ASSOCIATION [DIST]

	LEFT BANK	*	*RIGHT BANK*
PA#1:	420[100']	*	420[40']
PA#2:	15[100']	*	15[160']
PA#3:		*	
PA#4:			
PA#5:			

TRAP RESULTS (60 min. set)
T#1 0
T#2 3DV
T#3 0

SUBSTRATE

BEDROCK:	10 %
SM BOULDER:	10 %
LG RUBBLE:	20 %
SM RUBBLE:	25 %
CRS GRAVEL:	20 %
FINE GRAVEL:	10 %
VFG/SAND:	5 %
ORGANIC/SILT:	0 %

SIDESLOPE LENGTH & ANGLE

	ft/%	ft/%	ft/%	ft/%	ft/%
R.BANK	200/0				
L.BANK	200/0				

STREAM GEOMETRY

	BF	*LB*	****	****	****	****	****	*LB*	*BF*
DISTANCE(ft):	39.0		35.0	29.5	21.0	14.0	7.0	0.4	0.0
BANKFULL DEPTH(ft):	4.0		4.35	4.70	5.21	5.42	5.66	5.0	3.0
ACTIVE DEPTH(ft):	*LEFT*		N/A	N/A	0.92	1.20	1.6	0.99	*RIGHT*
THALWAG LOCATION:				AW		THWG		AW	

L.O.D. TALLEY (DIAMETER)

(LENGTH)	4 - 6"	6 - 12"	12 - 24"	24 - 36"	>36"
< 10 ft			C1,E1	C1,E1	
10-25 ft		B1	B1,C10,E3	C2	
25-50 ft			C5,E2	C3,E2	
50-100 ft			B1,E1		
>100 ft					

AVERAGE KEY PIECE DIAMETER/LENGTH
24 20

TRANSECT LENGTH: 350 ft.
CLUMP TALLEY:B1,C1,E2
DEBRIS POOLS:B1,C4

COMMENTS:

CHANNEL TYPE VERIFICATION CARD

DATE: 89/06/13 VCU: 769 SEG: N/A SITE: 9001 AREA: 05
R.D.: 052 MGT AREA: K43 SUB SEC: 7 1/4 QUAD: KTN-B4-SE
STREAM: ALAVA BAY
ADF&G: 101-41-10350-
BASIN AREA: 2.80 sq mi PERCENT LAKE: 0.6 % PRECIPITATION: 140 in.
SITE ELEVATION: 75 ft. MAXIMUM ELEVATION: 190 ft.
AEROPHOTO (YR/FLT/ROLL/PHOTO): 62/03/EFG/102
UPSTREAM PHOTO: 901-02 DOWNSTREAM PHOTO: 901-03
WATER: 12.0 C. AIR: 16.0 C. TIME: 1000 hrs
SITE DISTURBED: N WEATHER: RAIN

****
*PRELIM CT: C2 *
* FINAL CT: C2 *
****

GRADIENT: 2.0 %
STREAM PATTERN: SINGLE
BANK CONTROL: BEDROCK
BANKFULL WIDTH: 59.0 ft.
ACTIVE WIDTH: 34.5 ft.
AVG.POOL DEPTH: 1.5 ft.
POOLS: 7
POOLS: 35 % FISH OBSERVED: Y
ASA: 5 % LIFESTAGE: J
ARA: 25 % IDENTITY:DV

ADJACENT LANDFORM & VEGETATION

	LEFT BANK	*RIGHT BANK*
LANDFORM:	61	61
CANOPY:	C4	C4
INCISION:(meters)	1 - 2	1 - 2

	PLANT ASSOCIATION [DIST] *LEFT BANK*	PLANT ASSOCIATION [DIST] *RIGHT BANK*
PA#1:	710 [200']	710[32']
PA#2:		720[71']
PA#3:		470[97']
PA#4:		
PA#5:		

TRAP RESULTS (60 min. set)
T#1 0
T#2 0
T#3 0

SIDESLOPE LENGTH & ANGLE

	ft/%	ft/%	ft/%	ft/%	ft/%
R.BANK	32/70	168/5			
L.BANK	40/70	50/85	110/70		

SUBSTRATE

BEDROCK:	70 %
SM BOULDER:	10 %
LG RUBBLE:	5 %
SM RUBBLE:	5 %
CRS GRAVEL:	5 %
FINE GRAVEL:	5 %
VFG/SAND:	0 %
ORGANIC/SILT:	0 %

STREAM GEOMETRY

	BF	*LB*	****	****	****	****	****	*LB*	*BF*
DISTANCE(ft):	62.0	60.5	47.0	36.0	30.7	25.0	14.0	11.4	3.0
BANKFULL DEPTH(ft):	2.80	5.75	6.09	6.20	6.80	6.42	5.50	4.88	2.40
ACTIVE DEPTH(ft): *LEFT*			0.35	0.32	0.85	0.28			*RIGHT*
THALWAG LOCATION:		AW			THWG	AW			

L.O.D. TALLEY (DIAMETER)

(LENGTH)	4 - 6"	6 - 12"	12 - 24"	24 - 36"	>36"
< 10 ft					
10-25 ft		A-1,C-1			
25-50 ft		A-1,C-1,E-1	C-2,E-1		
50-100 ft					
>100 ft					

AVERAGE KEY PIECE DIAMETER/LENGTH
12"/25'

TRANSECT LENGTH: 314 ft.
CLUMP TALLEY:C-1,E-1
DEBRIS POOLS:C-1,E-1

COMMENTS: Red alder present. Dolly Varden were present but no Coho were trapped.

CHANNEL TYPE VERIFICATION CARD

```
DATE: 89/06/20  VCU: 779  SEG: N/A   SITE: 9001   AREA: 05   ******************
R.D.: 052  MGT AREA: K43 SUB SEC: 8    1/4 QUAD: KTN-D4-SE   *PRELIM CT: C5    *
STREAM: INDIAN CREEK                                         * FINAL CT: C2.7  *
ADF&G:  101-75-10850-                                        ******************
BASIN AREA:  16.80 sq mi    PERCENT LAKE:   1.5 %    PRECIPITATION:    130 in.
SITE ELEVATION:    125 ft.        MAXIMUM ELEVATION:   3970 ft.
AEROPHOTO (YR/FLT/ROLL/PHOTO): 62/17/EKW/199          GRADIENT:        0.5  %
UPSTREAM PHOTO: 902-04    DOWNSTREAM PHOTO: 902-05    STREAM PATTERN: SINGLE
WATER: 10.0 C.  AIR: 17.0 C.  TIME:       hrs         BANK CONTROL:   MIXED
SITE DISTURBED: N       WEATHER: HIGH OVERCAST        BANKFULL WIDTH:  74.4 ft.
                                                      ACTIVE WIDTH:    69.7 ft.
             ADJACENT  LANDFORM  &  VEGETATION        AVG.POOL DEPTH:   4.0 ft.
             *LEFT BANK*          *RIGHT BANK*        # POOLS:           2
LANDFORM:          42                   42            POOLS: 10 % FISH OBSERVED: Y
CANOPY:            C5                   C5            ASA:    0 % LIFESTAGE:    J
INCISION:(meters) 1-2                   <1            ARA:    5 % IDENTITY:CT

        PLANT ASSOCIATION [DIST]   *  PLANT ASSOCIATION [DIST]    TRAP  RESULTS
                *LEFT BANK*        *       *RIGHT BANK*            (60 min. set)
                                   *                              T#1 3 CT
PA#1:                310[20']            320[20']                T#2 0
PA#2:                420[180']           120[180']               T#3 3 CT
PA#3:
PA#4:                                                                *SUBSTRATE*
PA#5:
                                                                  BEDROCK:  10 %
            SIDESLOPE LENGTH & ANGLE                            SM BOULDER:  10 %
                                                                 LG RUBBLE:   5 %
         ft/%    ft/%    ft/%    ft/%    ft/%                   SM RUBBLE:   5 %
R.BANK   40/30 160/100                                          CRS GRAVEL:   5 %
                                                               FINE GRAVEL:  25 %
L.BANK   15/60  20/0   165/30                                     VFG/SAND:  40 %
                                                              ORGANIC/SILT:   0 %
                                STREAM    GEOMETRY
                   *BF* *LB* **** **** **** **** **** *LB* *BF*
DISTANCE(ft):      83.0 79.7 78.0 64.0 50.0 36.0 22.0 10.0  8.5
BANKFULL DEPTH(ft):  2.1  3.8  4.1  2.8  4.7  5.2  6.7  4.9  3.4
ACTIVE DEPTH(ft): *LEFT*      0.34       1.4  1.7  3.1      *RIGHT*
THALWAG LOCATION:         AW                     THWG   AW

                 L.O.D.  TALLEY (DIAMETER)
          4 - 6"   6 - 12"   12 - 24"   24 - 36"   >36"  AVERAGE KEY PIECE
(LENGTH)                                                   DIAMETER/LENGTH
<  10    ft                                                   24      50
10-25    ft                     A2
25-50    ft                    A2,C1        C1            TRANSECT LENGTH: 200 f
50-100   ft                     C1          A2            CLUMP TALLEY:C1
>100     ft                                                DEBRIS POOLS:A3,C1

COMMENTS: Glide phase of C2, a few pools present associated with LOD.  Large
          cutthroat present outside traps.
```

CHANNEL TYPE VERIFICATION CARD

DATE: 89/06/14 VCU: 837 SEG: N/A SITE: 9001 AREA: 05
R.D.: 052 MGT AREA: K43 SUB SEC: 9 1/4 QUAD: KTN-A2-SE
STREAM: RED RIVER
ADF&G: 101-30-10700-

****
*PRELIM CT: C1.4 *
* FINAL CT: C3 *
****

BASIN AREA: 15.70 sq mi PERCENT LAKE: 0.0 % PRECIPITATION: 200 in.
SITE ELEVATION: 250 ft. MAXIMUM ELEVATION: 4330 ft.
AEROPHOTO (YR/FLT/ROLL/PHOTO): 65/6/ENL/192 GRADIENT: 1.0 %
UPSTREAM PHOTO: 901-09 DOWNSTREAM PHOTO: 901-10 STREAM PATTERN: MULTIPLE
WATER: 6.0 C. AIR: 11.0 C. TIME: hrs BANK CONTROL: ALLUVIUM
SITE DISTURBED: N WEATHER: HIGH OVERCAST BANKFULL WIDTH: 138.0 ft.
ACTIVE WIDTH: 137.0 ft.
AVG.POOL DEPTH: 5.0 ft.
POOLS: 7
POOLS: 20 % FISH OBSERVED: N
ASA: 35 % LIFESTAGE:
ARA: 10 % IDENTITY:

ADJACENT LANDFORM & VEGETATION

	LEFT BANK	*RIGHT BANK*
LANDFORM:	53	53
CANOPY:	C6	C6
INCISION:(meters)	1-2	1-2

	PLANT ASSOCIATION [DIST] *LEFT BANK*	PLANT ASSOCIATION [DIST] *RIGHT BANK*
PA#1:	320[200']	320[75']
PA#2:		340[125']
PA#3:		
PA#4:		
PA#5:		

TRAP RESULTS (60 min. set)
T#1 N/A
T#2 N/A
T#3 N/A

SUBSTRATE

BEDROCK:	0 %
SM BOULDER:	0 %
LG RUBBLE:	0 %
SM RUBBLE:	20 %
CRS GRAVEL:	30 %
FINE GRAVEL:	20 %
VFG/SAND:	30 %
ORGANIC/SILT:	0 %

SIDESLOPE LENGTH & ANGLE

	ft/%	ft/%	ft/%	ft/%	ft/%
R.BANK	200/0				
L.BANK	200/0				

STREAM GEOMETRY

	BF	*LB*	****	****	****	****	****	*LB*	*BF*
DISTANCE(ft):	139	138	128	111	86.0	33.3	15.0	1.0	1.0
BANKFULL DEPTH(ft):	1.00	8.10	7.10	5.40	3.96	4.28	5.68	6.80	6.80
ACTIVE DEPTH(ft):	*LEFT*	2.70	2.40	1.20			1.20	1.80	*RIGHT*
THALWAG LOCATION:		AW	THWG					AW	

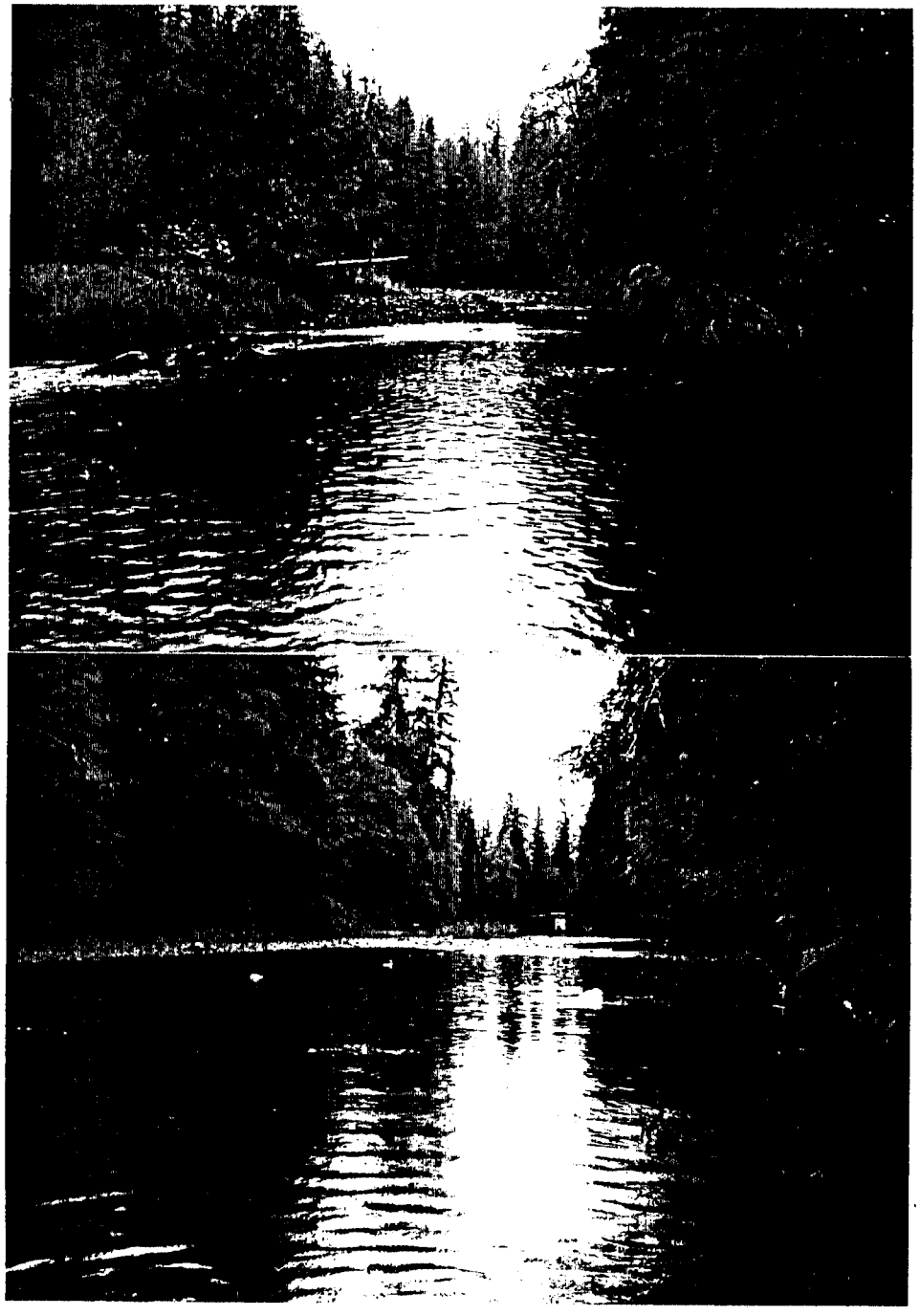
L.O.D. TALLEY (DIAMETER)

(LENGTH)	4 - 6"	6 - 12"	12 - 24"	24 - 36"	>36"
< 10 ft				A1,E1	
10-25 ft			A3	C1	
25-50 ft				A1,C1,E1	C1,E1
50-100 ft				B1	
>100 ft				A1,E1	

AVERAGE KEY PIECE
DIAMETER/LENGTH
30 50

TRANSECT LENGTH: 350 ft.
CLUMP TALLEY:C1,E1
DEBRIS POOLS:A2,C1,E3

COMMENTS: No traps set, too swift. Lots of enchanters nightshade, red osier dogwood and stink current. Left BF difficult to determine due to dense underbrush.



CHANNEL TYPE VERIFICATION CARD

DATE: 89/06/13 VCU: 770 SEG: N/A SITE: 9001 AREA: 05
R.D.: 052 MGT AREA: K43 SUB SEC: 7 1/4 QUAD: KTN-B4-SE
STREAM: KAARI CREEK
ADF&G: 101-51-10670

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*******************
*PRELIM CT: C1    *
* FINAL CT: C3.1  *
*******************
```

BASIN AREA: 4.70 sq mi PERCENT LAKE: 0.7 % PRECIPITATION: 120 in.
SITE ELEVATION: 75 ft. MAXIMUM ELEVATION: 1830 ft.
AEROPHOTO (YR/FLT/ROLL/PHOTO): 59/2/EFG/123
UPSTREAM PHOTO: 901-4 DOWNSTREAM PHOTO: 901-5
WATER: 13.5 C. AIR: 16.5 C. TIME: hrs
SITE DISTURBED: N WEATHER: RAIN

GRADIENT: 1.0 %
STREAM PATTERN: SINGLE
BANK CONTROL: MIXED
BANKFULL WIDTH: 86.0 ft.
ACTIVE WIDTH: 72.0 ft.
AVG.POOL DEPTH: 1.6 ft.
POOLS: 6
POOLS: 5 % FISH OBSERVED: Y
ASA: 20 % LIFESTAGE: J
ARA: 15 % IDENTITY:CT,DV

ADJACENT LANDFORM & VEGETATION

	LEFT BANK	*RIGHT BANK*
LANDFORM:	53	53
CANOPY:	C4	C1
INCISION:(meters)	<1	1-2

PLANT ASSOCIATION [DIST]

	LEFT BANK	*	*RIGHT BANK*
PA#1:	352[50']	*	730[200']
PA#2:	410[150']	*	
PA#3:		*	
PA#4:			
PA#5:			

TRAP RESULTS
(60 min. set)
T#1 3CT, 2DV
T#2 6CT, 3DV
T#3 12CT,2DV

SUBSTRATE

BEDROCK:	5 %
SM BOULDER:	20 %
LG RUBBLE:	20 %
SM RUBBLE:	20 %
CRS GRAVEL:	20 %
FINE GRAVEL:	5 %
VFG/SAND:	10 %
ORGANIC/SILT:	0 %

SIDESLOPE LENGTH & ANGLE

	ft/%	ft/%	ft/%	ft/%	ft/%
R.BANK	20/20	180/0			
L.BANK	200/0				

STREAM GEOMETRY

	BF	*LB*	****	****	****	****	****	*LB*	*BF*
DISTANCE(ft):	86.0	84.9	72.6	68.0	51.0	34.0	17.0	0.6	0.0
BANKFULL DEPTH(ft):	2.50	5.60	5.43	5.66	5.78	6.19	6.71	6.02	2.40
ACTIVE DEPTH(ft):	*LEFT*			0.19	0.52	1.10	1.38	0.32	*RIGHT*
THALWAG LOCATION:			AW				THWG	AW	

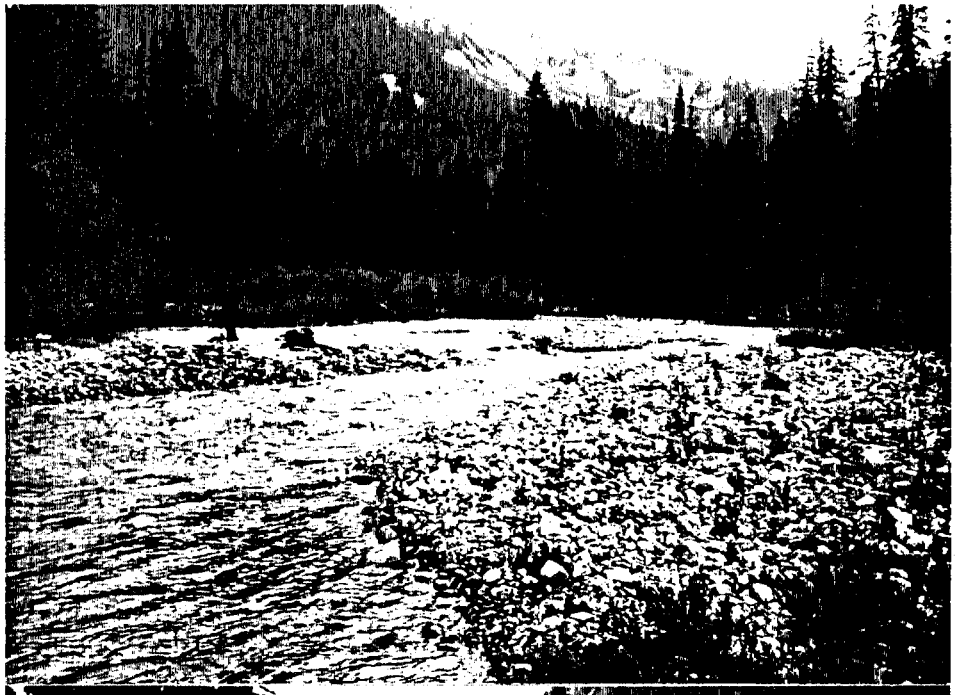
L.O.D. TALLEY (DIAMETER)

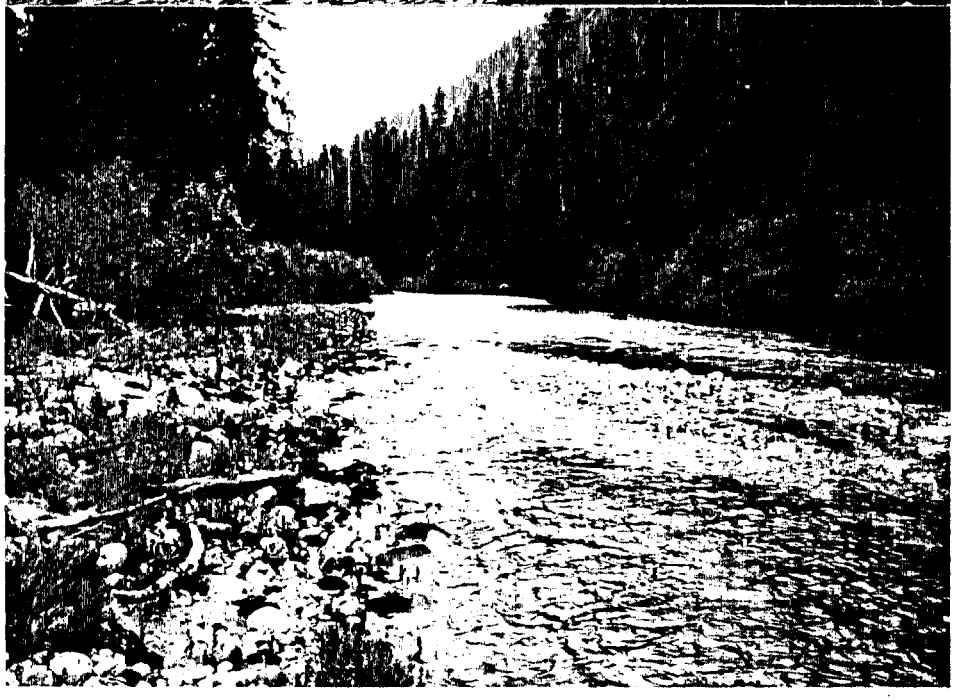
(LENGTH)	4 - 6"	6 - 12"	12 - 24"	24 - 36"	>36"
< 10 ft					
10-25 ft					C1,E1
25-50 ft	C2,E2	C1,E1	A2,C1,E1	C1	
50-100 ft			C2,E2	C2,E1	
>100 ft					

AVERAGE KEY PIECE
DIAMETER/LENGTH
18 40

TRANSECT LENGTH: 900 ft.
CLUMP TALLEY:C3,E3
DEBRIS POOLS:C3,E3

COMMENTS: 90 minute trap set. Evidence of spring highwater LOD lodged high in shrubs etc., and very little present in the channel. Bedrock ledge inclusions. Lots of Viola and Arnica along banks, as well as monark spruce. Lots of small debris wedged in CEs.





CHANNEL TYPE VERIFICATION CARD

DATE: 89/06/14 VCU: 842 SEG: N/A SITE: 9001 AREA: 05
R.D.: 052 MGT AREA: K43 SUB SEC: 9 1/4 QUAD: KTN-B2-NE
STREAM: KETA RIVER
ADF&G: 101-30-10300

****
*PRELIM CT: C3.1 *
* FINAL CT: C3.1 *
****

BASIN AREA: 19.40 sq mi PERCENT LAKE: 0.0 % PRECIPITATION: 190 in.
SITE ELEVATION: 550 ft. MAXIMUM ELEVATION: 4895 ft.
AEROPHOTO (YR/FLT/ROLL/PHOTO): 65/10/ENL/173
UPSTREAM PHOTO: 901-14 DOWNSTREAM PHOTO: 901-15
WATER: 6.0 C. AIR: 13.0 C. TIME: hrs
SITE DISTURBED: N WEATHER: HIGH OVERCAST

GRADIENT: 1.5 %
STREAM PATTERN: MULTIPLE
BANK CONTROL: ALLUVIUM
BANKFULL WIDTH: 172.0 ft.
ACTIVE WIDTH: ft.
AVG.POOL DEPTH: 1.5 ft.
POOLS:
POOLS: 10 % FISH OBSERVED: N
ASA: 40 % LIFESTAGE: NA
ARA: 10 % IDENTITY:NA

ADJACENT LANDFORM & VEGETATION

	LEFT BANK	*RIGHT BANK*
LANDFORM:	53	53
CANOPY:	C3	C3
INCISION:(meters)	1-2	1-2

	PLANT ASSOCIATION [DIST] *LEFT BANK*	PLANT ASSOCIATION [DIST] *RIGHT BANK*
PA#1:	320[200']	320[200']
PA#2:		
PA#3:		
PA#4:		
PA#5:		

TRAP RESULTS (60 min. set)
T#1 0
T#2 0
T#3 0

SIDESLOPE LENGTH & ANGLE

	ft/%	ft/%	ft/%	ft/%	ft/%
R.BANK	200/0				
L.BANK	200/0				

SUBSTRATE

BEDROCK:	0 %
SM BOULDER:	25 %
LG RUBBLE:	20 %
SM RUBBLE:	20 %
CRS GRAVEL:	20 %
FINE GRAVEL:	5 %
VFG/SAND:	10 %
ORGANIC/SILT:	0 %

STREAM GEOMETRY

BF *LB* **** **** **** **** **** *LB* *BF*

DISTANCE(ft):
BANKFULL DEPTH(ft):
ACTIVE DEPTH(ft): *LEFT* *RIGHT*
THALWAG LOCATION:

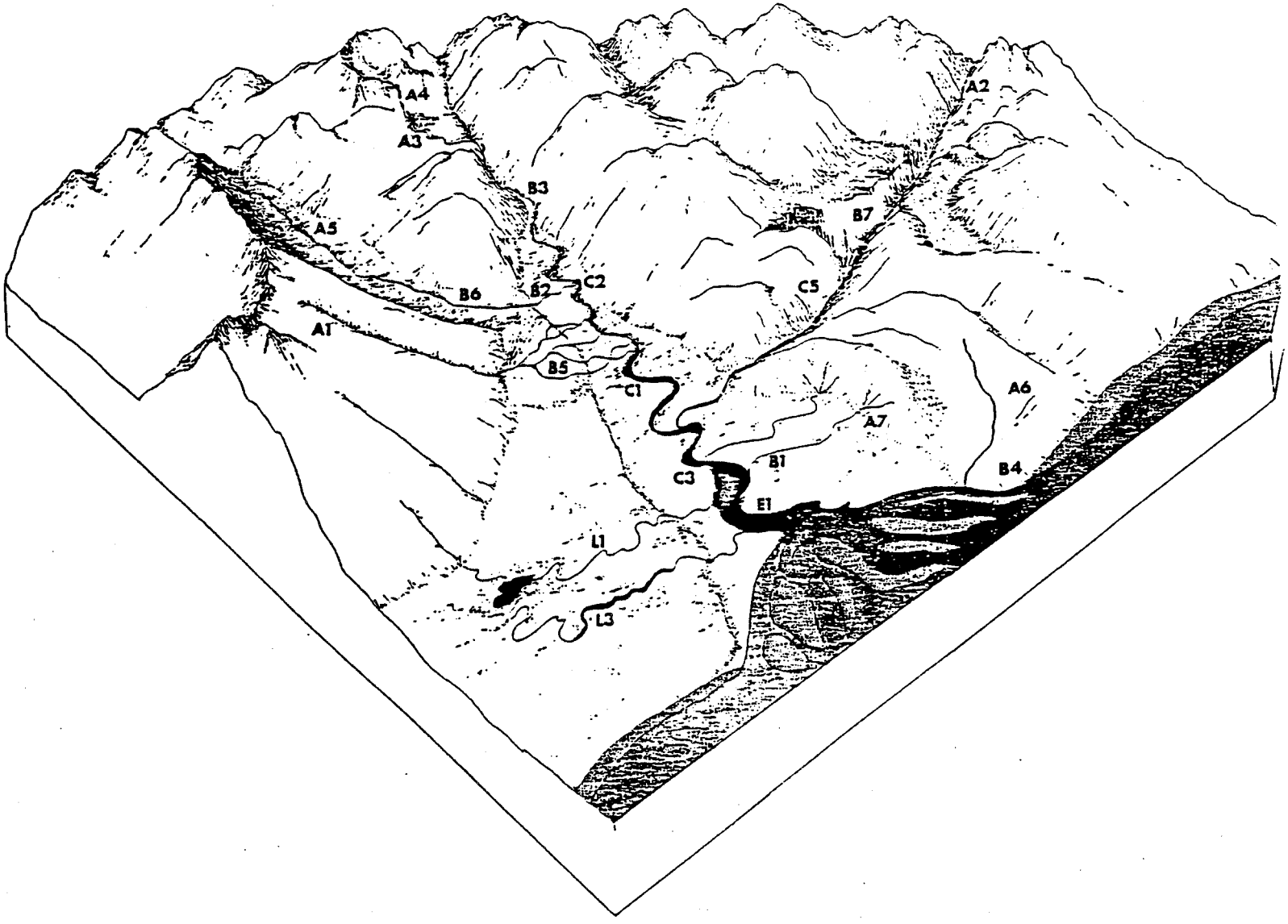
L.O.D. TALLEY (DIAMETER)

(LENGTH)	4 - 6"	6 - 12"	12 - 24"	24 - 36"	>36"
< 10 ft			A2,E2		
10-25 ft					
25-50 ft			C2,E2		
50-100 ft			C2,E2		
>100 ft					

AVERAGE KEY PIECE
DIAMETER/LENGTH
18 75

TRANSECT LENGTH: 300 ft.
CLUMP TALLEY:C1,E1
DEBRIS POOLS:C1,E1

COMMENTS: BF an estimate; 65'channel, 95' gravel bar, 12' channel. Too swift to cross. Dwarf fireweed, moss, willow, cottonwood, carex, sitka alder, goats beard on bar. Very little LOD. Too swift to trap.



CHANNEL TYPE DISTRIBUTION

FOR A TYPICAL WATERSHED

REVISED 11/01/89, INCORPORATES REVISIONS AGREED TO AT CT CORRELATION MEETING 10/23-27 1989, JUNEAU.

SUMMARY OF THE DIFFERENTIA USED TO MAP TONGASS NATIONAL FOREST CHANNEL TYPES

Channel Type Description	Gradient Width Pattern Vegetation	Control Process Substrate	Basin Area Landfrom Side Slope Incision	Comments and Special Mapping Conventions
A1 - Forested, steep mnt. slope channel	>15% Gradient <15 M Width Single channel C9, C7, C4, C5, C1 B1, A1	Bedrock Transport Br, Bldr, Rubb	Small 30's,40's,10's,51 >10 M; >100% <50 M Incision	Linear channel pattern, Very high gradient, V-notch
A2 - Forested, high grad upper valley channel	6 - 15% Gradient </ 20 M WIDTH Single channel C5,C3,C1,C4, B1.	BR - Mixed Transport BR, Bldr, Rubb	Small - Moderate 30's, 40's >20 M; <100% <50 M Incision	A2 CT's associated w/ upper valley development
A3 - Forested, high gradient alluvial cone channel	>6% @ Midpoint VARIABLE Single - Multiple ALL B'S AND ALL C'S	Alluvial to mixed. Transport/Storage C. Grv. - BLDR	Small - Moderate 52, 51 <2 M </ 4 M Incision	Minimum legnth is 200 M Poor flow containment, no side slope developmt Exclusively assoc. with alluvial cone landform.
A4 - Very high gradient, mountain slope cascade channel	>/ 15 % gradient Variable width Single Channel All C's,A's, B1	BR but may vary Transport BR, Bldr, Rubb	Small 10, 40's, 51,52 <10 M <10 M Incision	Waterfalls & steep cascades very common

SUMMARY OF THE DIFFERENTIA USED TO MAP TONGASS NATIONAL FOREST CHANNEL TYPES

Channel Type Description	Gradient Width Pattern Vegetation	Control Process Substrate	Basin Area Landform Side Slope Incision	Comments and Special Mapping Conventions
A5 - Lowland, high grad. incised muskeg channel	6 - 20% Gradient 6 - 15 M Width Single Channel C9, C5, C4	Bedrock Transport BR, Bldr, Rubb	Small - Moderate 60's, 40's, 36 6 - 20 M, >100% 6 - 20 M Incision	May appear in high elev headwaters, abrupt incision, containment excellent
A6 - High grad. shallow - moderate incision lowland, muskeg channel	6 - 15% Gradient </ 10 M Width Single Channel C4	BR - Mixed Transport BR - Rubble	Small - Moderate 60's, 40's, 36 <6 M Side Slope <6 M Incision	Well contained w/ mod - shallow incision
A7 - High grad. shallow footslope channel	6 - 15% Gradient <15 M Width Single Channel C4 or better All B's	BR, may vary Transport Br, Bldr, Rubb	Small - Moderate 51, 52, 40's <10 M Side Slope 1 - 10 M Incision	High grad, forested footslope channel Most often assoc. with footslope 52.
B1 - Small, lowland, low gradient alluvial forest channel	< 2% Gradient <10 M Width Single - Multiple Most C's	Alluvial Depositional Sand - Sm.Rubb	Small - Moderate 53,52,42,61,62 Short, shallow </ 2 M Incision	Beaver activity common on the B1 channel

SUMMARY OF THE DIFFERENTIA USED TO MAP TONGASS NATIONAL FOREST CHANNEL TYPES

Channel Type Description	Gradient Width Pattern Vegetation	Control Process Substrate	Basin Area Landform Side Slope Incision	Comments and Special Mapping Conventions
B1.4 - Lowland non-forested low gradient channel	<2% Gradient <10 M Width Single Channel M1, M3	Alluvial Depositional Sand - C. Grv	Small - Moderate 53, 61, 62 Negligible <2 M Incision	B1.4 is a non-forested phase located in open meadows. Similar to L1 w/ sand/gravel bar deve
B1.5 - Forested Yakutat Foreland channel	<2% Gradient ~~<15~~ M Width Single Channel C1, C3	Alluvial Depositional Sand - F. Grv.	Small - Moderate Yakutat Foreland Negligible <2 M Incision	Vegetation is Sitka spruce//Devils club & Sitka spruce/Devils clu Vaccinium
B1.6 - Non-forested Yakutat Foreland	<2% Gradient <15 M Width Single Channel All B's	Alluvial Depositional Sand - C. Grv.	Small - Moderate Yakutat Foreland	Found on lowland (60's) Alder/willow & Willow/ salmonberry plant assoc
B2 - Forested, moderate gradient, narrow valley channel	2 - 6% Gradient ~~<~~ 10 M Width Single Channel C4 or better	Alluvial - Mixed Transport - Deposit F.Grv - Sm. Bldr.	Small - Moderate 40, 50, 60 Short, shallow <4 M Incision	Floodplain terrace is at least 1X bankfull Channel is a B2

SUMMARY OF THE DIFFERENTIA USED TO MAP TONGASS NATIONAL FOREST CHANNEL TYPES

Channel Type Description	Gradient Width Pattern Vegetation	Control Process Substrate	Basin Area Landform Side Slope Incision	Comments and Special Mapping Conventions
B3 - Forested, moderate gradient, upper valley	2 - 6% Gradient >10 M Width Single Channel C4 or better	Alluvial - Mixed Transport Variable	Moderate - Large 40, 50, & 60's Variable <4 M Incision	Variable landform; active floodplain terraces present
B3.4 - High energy upper valley forest channel	2 - 6% Gradient >10 M Width Single Channel B1, A2	Alluvial - Mixed Transport C.Grv. - Rubb., S.Bldr	Moderate - Large 30, 40, 50, 60 Variable <3 M Incision	High energy, upper valley brush channel
B4 - Scrubby, moderate gradient channel	<6% Gradient <10 M Width Single Channel C5 or poorer	BR - Mixed Transport C.Grv - BR	Small - Mod 61, 62, 40's Short, Shallow </ 4 M Incision	
B5 - Forested, moderate gradient, alluvial fan channel	1 - </ 6% Gradient <20 M Width Single - Multiple C1, C3, C5, C6	Alluvial Depositional F.Grv. - Lg.Rubb.	Small 52, 53 Short, Shallow <2 M Incision	B5 is a transitional alluvial fan channel between high gradient A CT to Valley CT's

SUMMARY OF THE DIFFERENTIA USED TO MAP TONGASS NATIONAL FOREST CHANNEL TYPES

Channel Type Description	Gradient Width Pattern Vegetation	Control Process Substrate	Basin Area Landform Side Slope Incision	Comments and Special Mapping Conventions
B6 - Moderate gradient, lowland muskeg chan.	2 - 6% Gradient <20 M Width Single Channel C4, C5, C8	BR - Mixed Transport C. Grv. - BR	Small - Mod 60, 40, 51 4 - 20 M Side Slope 4 - 20 M Incision	The abruptly incised B6 chan. often follows BR fracture zones and may display linear or rectangular pattern
B7 - Deep gorge channel, brushy, moderate-high gradient	> 4% Gradient <15 M Width Single Channel C9,C7,C6, A1	BR Transport Rubb - BR	Mod - Large 54 >20 M, >70% >10 M Incision	Contains major falls. B7 is an abrupt deeply incised channel w/ very steep side slopes
C1 - Forested, lower valley, low grad channel	</ 2% Gradient 10 - 20 M Width Single - Multiple C1,C3,C5,C6,C9 and D's.	Alluvial Depositional Sand - Rubble	Large 53, all 60's Short - shallow </ 2 M Incision	Floodplain channel. Multiple channels & bar development common

SUMMARY OF THE DIFFERENTIA USED TO MAP TONGASS NATIONAL FOREST CHANNEL TYPES

Channel Type Description	Gradient Width Pattern Vegetation	Control Process Substrate	Basin Area Landform Side Slope Incision	Comments and Special Mapping Conventions
C1.1 - Forested low gradient, high energy channel	<2% Gradient 10 -20 M Width Single - Multiple C3, Co, B1, B3, D1, M3	Alluvial Deposition - Transport F. Grv - Lg. Rubble	Large S3 Shallow - Deep	Includes forested & non forest phases.
C1.3 - Kruzof Ash Phase (volcanic ash phase located on Kruzof Island)				
C1.4 - Non-forested Phase of C1 channel; Vegetation is M2, M3 or marginal stringers of C4, C8. Substrate are sandy.				
C1.5 - Yakutat Forelands Glacial Outwash, Forested Phase (old F1 channel) Vegetation consists of Sitka Spruce/Cottonwood/ Willow or Sitka Spruce/Devils Club/Vaccinium plant associations. Substrate is predominately sand and gravel.				
C1.6 - Yakutat Forelands Glacial Outwash, Non-forested Phase (old F2 channel) Vegetation consists of Willow/Sedge, Alder/Willow and Cottonwood/Alder plant associations. Stream gradient is low (<0.5%). Substrates are predominately sand and gravel. Bankfull width averages 13 m.				
C1.8 - Underfit Glacial Phase, associated with flat lowlands and outburst flooplains. C1 and B canopy types compose riparian vegetation.				
C2 - Lower valley or muskeg type landforms; low gradient, incised channel	<1 2% Gradient >10 M Width Single channel C5, C4, C8,	Bedrock - mixed Transport C.Grv - BR	Large - Very Large 40's, 60's Steep, <20 M < 10 M Incision	Meanders cannot exceed 1/2 bankful width Discontinuous S3 landforms can occur
C2.7 - Lower valley, low gradient, incised channel	<2% Gradient >7 M Width Single channel C5, C4, C3, C6, C1	Bedrock Deposition Rubb, Bldr, BR	Large - Very Large 40's, 60's Steep, <20 M Variable	Glide phase of C2
C2.8 - Glacial MOraine Phase, associated with flat lowlands and outburst floodplains, large erratic boulders may be present in substrate, bankfull width averages 26 m.				

SUMMARY OF THE DIFFERENTIA USED TO MAP TONGASS NATIONAL FOREST CHANNEL TYPES

Channel Type Description	Gradient Width Pattern Vegetation	Control Process Substrate	Basin Area Landform Side Slope Incision	Comments and Special Mapping Conventions
C3 - Forested, broad, low gradient, lower valley channel	<2% Gradient >20 M Width Single - Multiple C3,C5,C6, All O's.	Alluvial Depositional Sand - Sm. Rubb.	Very Large 53 Flat, Variable < 2M Incision	
C3.1 - Broad, high energy phase, lower valley channel. Old C4 - incl. forest & non-forested phase	<2% Gradient >20 M Width Single - Braided B1, C3, C6	Alluvial Depositional C. Grv - S. Bldr	Very large 53 Flat, Variable <2 M Incision	Often times occurs where A1 CT's feed directly into low gradient valley bottom channels
C3.3 - Broad, low grad. lower valley, bedrock influenced channel	<2% Gradient >20 M Width Single - Multiple C6, C3	BR influenced Transport F. Grv - BR	Very Large 53 Flat, Variable	BR influenced phase, C2/C3 mix found as channel approaches salt water
C3.4 - Broad, placid, low gradient channel	<2% Gradient >20 M Gradient Single Channel • C6, C3	Alluvial Depositional F. Grv - Rubb	Very Large 53 Flat, Variable	Non-forested, placid water phase of C3

SUMMARY OF THE DIFFERENTIA USED TO MAP TONGASS NATIONAL FOREST CHANNEL TYPES

Channel Type Description	Gradient Width Pattern Vegetation	Control Process Substrate	Basin Area Landform Side Slope Incision	Comments and Special Mapping Conventions
C3.5 - Yakutat Foreland Glacial Outwash Forested Channel (Old F3)				
C3.6 - Yakutat Foreland Glacial Outwash Forested Channel (Old F4)				
C4 - Beach and sand dune channel	<0.5% Gradient >12 M Width Single - Multiple C6, B3	Alluvial Depositional Sand, F. Grv, Silt	Large - Very Large 72 Shallow <2 M Incision	Competing channels: B1.5 & L1
C4.4 - Non-forested Phase (Old G6)				
C5 - Confined narrow valley, forested channel	<7 5% Gradient 10 - 30 M Width Single channel C5,C4,C3	Bedrock-mixed Transport - Deposition C.Grv.- BR	Large - Very Large 30's, 51,54, 61, 40'S >20 M, <70% Variable Incision	Channel occurs within narrow confining valley Varied incision.
L1 - Low gradient, lowland muskeg channel with ponds or placid flow	<2% Gradient <10 M Width Single channel M1,M2,M3, B3	Alluvial Depositional Muck, Sand	Small 60's, 40's, 53 Flat, negligible <7 2 M Incision	Assoc. w/53 's in broad river valley affected by wide range in river stage

SUMMARY OF THE DIFFERENTIA USED TO MAP TONGASS NATIONAL FOREST CHANNEL TYPES

Channel Type Description	Gradient Width Pattern Vegetation	Control Process Substrate	Basin Area Landform Side Slope Incision	Comments and Special Mapping Conventions
L1.4 - Scrub forest phase, lowland, low gradient, muskeg channel	<2% Gradient <10 M Width Single M1, M3, C4	Alluvial Depositional Muck, Sand	Small 60's, 40's Flat, negligible <2 M Incision	Canopy is scrubby and in narrow bands
L2 - Wide, low gradient deep water, muskeg channel	0 - 1% gradient >10 M Width Single channel All B's and M's	Alluvial Depositional Muck, Sand	Large - Very Large 60's, 53, Nonglacial Flat, negligible </ 2 M Incision	Commonly associated with lake outlet or meadow area
L3 - Stable beaver dam, pond chain complex	<1% Gradient Variable Single channel B1,B2, C3,C4,C6, M3	Alluvial Depositional Muck - F.Grv.	Small 60's, 40's, 53 Flat, variable </ 2 M Incisio	Series of beaver ponds, often recognized on the aerial photo by a stand of dead trees
THIS CT HAS BEEN REVISED SEE NEW DESCRIPTION BELOW L4 - Glacial floodplain cut-off slough channel	<1% Gradient Variable Multiple - Braided Variable veg.	Alluvial Depositional Muck - Rubb.	Small 53, 64, Flat, negligible </ 4 M Incisio	Mapped as connected side channels of lower valley glacial channels Active floodplain

SUMMARY OF THE DIFFERENTIA USED TO MAP TONGASS NATIONAL FOREST CHANNEL TYPES

Channel Type Description	Gradient Width Pattern Vegetation	Control Process Substrate	Basin Area Landfrom Side Slope Incision	Comments and Special Mapping Conventions
THIS CT HAS BEEN REVISED SEE NEW DESCRIPTION BELOW				
L5 - Glacier floodplain backwater slough channel	<0.5% Gradient Variable Width Single channel Variable veg.	Alluvial Depositional Sand, mud	Small 53, 64,62 Flat, negligible <5 M incision	Floodplain backwater channel floodplain Main channel dominates flow regime in channel
Provisional Comment: May be found in glacial estuarine areas.				
E1 - Small substrate, large estuarine channel	</ 2% Gradient >10 M Width Single - Multiple E2, E3	Alluvial Depositional Sand - Rubb.	Large - Very Large 71 Flat, variable Shallow, 0 - 5M Incision	Width > 10 M at upstream boundary.
E1.3 - Large substrate large esturine channel	0 to 2% Gradient >10 M Width Single - Multiple E2, E3	Alluvial, mixed Depositional C.Grv. - Sm.Bldr.	Large - Very Large 71 Flat, variable Shallow, 0 - 5M Incision	Large substrate phase, typically no sedge/ grass area associated
E1.6 - Beach and dune estuarine channel (old E4 channel)	<1% Gradient >10 M Width Single - Multiple E2, E3	Alluvial Depositional Sand	Large - Very Large 72, 74 Flat, variable	Outer coastal area w/ sand and dune (22) and and uplifted beach (74) landforms

SUMMARY OF THE DIFFERENTIA USED TO MAP TONGASS NATIONAL FOREST CHANNEL TYPES

Channel Type Description	Gradient Width Pattern Vegetation	Control Process Substrate	Basin Area Landform Side Slope Incision	Comments and Special Mapping Conventions
E2 - Small rocky estuarine channel	0 to 3% Gradient <10 M Width Single Channel E2, E3	Alluvial, mixed Depositional C.Grv. - Bldr	Moderate - Large 71 Variable Shallow, <3 M	Width <10 M measured at upstream boundary, may be > 10 M depending on channel spreading through lower potion of estuary.
E3 - Narrow, small substrate, estuarine channel	<1 1% Gradient <10 M Width Single channel E2, E3	Alluvial Depositional Sand - Sm.Rubb	Moderate - Large 71 Flat, negligible Shallow, <3M Icision	Better quality habitat than the E2 channel Width <10 M at upstream end may be >10 M due to spreading as noted with the E2.
E5 - Broad braided glacial estuarine channel	<2% Gradient >20 M Width Multiple channel E1, E2, E3	Alluvial Depositional Sand	Moderate - Large 71 Shallow-Flat, variable Shallow, <3 M Incision	15% or greater of basin area covered by alpine glaciers or permanent snow fields
O1 - Low gradient cirque basin channel	<5% Gradient Width Variable Single - Braided A1, A2, B1	Alluvial Transport Sand- Sm.Bldr	Small 30's, 61 Shallow, Variable <1 2 M Incision	15% or greater of basin area covered by alpine glaciers or permanent snowfields.

SUMMARY OF THE DIFFERENTIA USED TO MAP TONGASS NATIONAL FOREST CHANNEL TYPES

Channel Type Description	Gradient Width Pattern Vegetation	Control Process Substrate	Basin Area Landform Side Slope Incision	Comments and Special Mapping Conventions
D2 - Upper valley glacial torrent channel	>6% Gradient 6 - 15 M Width Single channel A's, B's, C4,C6,C7 D1,D2	Variable Transport Rubb - BR	Small - Moderate 10's, 30's, 51,52 Variable Variable	15% or greater of basin area covered by alpine glaciers or permanent snowfields
D3 - Moderate gradient, upper valley gradient channel	2 - 6% Gradient Variable Width Single - Braided A's, B's, C6, D's	Alluvial - mixed Transport C.Grv. - Sm.Bldr.	Moderate 53, 52 Shallow, Variable </ 4M Incision	15% or greater of basin area covered by alpine glaciers or permanent snow fields
D4 - Broad low gradient meandering glacial channel	<3% Gradient Variable Width Single - Multiple B1, C4,C5,C6,C9, D's	Alluvial, contained Depositional C. Grv - Sm.Bl	Large - Very Large 53, Glacial, 61,62 Shallow, Variable </ 4M Incision	15% or greater of basin area covered by alpine glaciers or permanent snow fields
D5 - Broad, braided lower valley low gradient glacial channel	<3% Gradient >20 M Width Braided Channel B1, D1, D2, Co or no veg.	Alluvial Depositional Sand - Lg.Rubble	Large - Very Large 53, 64 Shallow Side Slope </ 2M Incision	15% or greater of basin area covered by alpine glaciers or permanent snow fields

SUMMARY OF THE DIFFERENTIA USED TO MAP TONGASS NATIONAL FOREST CHANNEL TYPES

Channel Type Description	Gradient Width Pattern Vegetation	Control Process Substrate	Basin Area Landform Side Slope Incision	Comments and Special Mapping Conventions
D6 - High gradient, glacial alluvial fan/cone channel	Variable Gradient Variable Width Single - Multiple A's, B's, C6	Alluvial Transport C.Grv.- BR	Small - Moderate 52, 51 - Fan/cone Shallow Side Slope </ 2M Incision	15% or greater of basin area covered by alpine glaciers or permanent snowfields
D7 - Confined, high gradient (cascade) glacial channel	5 - 10% Gradient 20 - 30 M width Single channel B2, C1,C7	Bedrock Transport Rubble to bedrock	Large 30's, 40's, 52, 54 Steep Side Slope >/ 16M Incision	Mid to lower valley position; cascades and short falls readily vis.
POLYGONS				
R - See D5				Perimeter of active D5 channel must be wider than xxxx feet to use polygon
L - Lake				Lake must be 5 acres or larger to be mapped
M - Marine deposition zone				Marine zone must be 10 acres or larger to be mapped

Revised channel type descriptions for the L4, L5, D8 and E4 cts. REVISED DEC 1989.

CHANNEL TYPE DESCRIPTION	GRADIENT WIDTH PATTERN VEGETATION	CONTROL PROCESS SUBSTRATE	BASIN AREA LANDFORM SIDE SLOPE INCISION	COMMENTS and SPECIAL MAPPING CONVENTIONS
D8 - GLACIAL SIDECHANNEL	</ 1.0% VARIABLE SINGLE TO MULTIPLE VARIABLE (M1,B1,B2,D1) (D2, C3,C4)	ALLUVIAL DEPOSITIONAL SILT - RUBBLE	LARGE TO VERY LARGE 53, 62, 64 SHALLOW TO FLAT </ 4 M	Usually associated with D5 riverines, upper width limit is < 200M, 0.5 in. on photos, 0.25 in. base maps. Formely called L4 CT.

MAPPING REVISION NOTE: Chatham Area mainland L4's and Stikine Area L4's as mapped pre-DECEMBER 1989, will have to be revised to the D8 ct.

L5 - DEEP UPLAND SLOUGH	</ 0.5% VARIABLE SINGLE VARIABLE (B1,B2,C6) (D1,D2,M1,M2)	ALLUVIAL DEPOSITIONAL SILT/CLAY - FINE GRVL	LARGE TO VERY LARGE 53, 62, 64 </ 4 M	Often associated with upliftad mudflats and glacial river terraces Clear water flow, deep rectangular x-section profile.

N.B. THE L5 IS A VERY LOW GRADIENT CHANNEL WITH SLUGGISH LAMINAR FLOW. GLACIAL SILT WATER FROM ADJACENT GLACIAL CHANNELS MAY INUNDATE THE LOWER PORTION OF THE L5 (i.e. at the interface of the L5 and the main river). THESE CHANNELS ARE DEEP SLOUGH GREATER THAN 3 FT. FOR BANKFULL DEPTH. BANKS ARE OFTEN COMPOSED OF SILT AND CLAY.

MAP REVISION NOTE: Convert Chatham Area B8 to L5, Chatham Area mainland and Situk L5's will remain as is.

L4 - SHALLOW GROUNDWATER FED SLOUGH	<1% GRADIENT VARIABLE MULTIPLE - BRAIDED VARIABLE VEG. TYPES	ALLUVIAL DEPOSITIONAL SILT - RUBBLE	VARIABLE 53, 64, 62 FLAT, NEGLIGIBLE </ 4M INCISION	Occupy relic glacial outwash channels, can be connected to main river, normally < 3 feet deep (bankfull).

N.B. THIS IS A NEW DESCRIPTION FOR THE L4, GROUNDWATER RECHARGE IS DOMINANT IN THESE SLOUGHS.

E4 - SILTY ESTUARY CHANNEL OR SLOUGH	< 1% GRADIENT < 20 M SINGLE E2, E3	ALLUVIAL DEPOSITIONAL SILT/CLAY - VFG/SAND	VARIABLE 71, 72 SHORT STEEP </ 4 M INCISION	May lie in proximity to large glacial E5 ct or M zones. High degree of sinuosity is normal.

FOREST PLANT ASSOCIATIONS

100	TSHE Series	Tsuga heterophylla	Western hemlock
110	TSHE/VACCI	/Vaccinium spp.	/blueberry
120	TSHE/VACCI/DRAU	/Vaccinium spp. /Dryopteris austriaca	/blueberry /spinulose shield-fern
130	TSHE/VACCI/LYAM	/Vaccinium spp. /Lysichitum americanum	/blueberry /skunk cabbage
140	TSHE/VACCI-OPHO (HP)	/Vaccinium spp. /Oplopanax horridium	/blueberry /devil's club
150	TSHE/VACCI-OPHO (MP)	/Vaccinium spp. /Oplopanax horridium	/blueberry /devil's club
160	TSHE/OPHO	/Oplopanax horridium	/devil's club
170	TSHE/OPHO/LYAM	/Oplopanax horridium /Lysichitum americanum	/devil's club /skunk cabbage
180	TSHE/OPHO/POMU	Oplopanax horridum/ Polystichum munitum	/devil's club sword fern
190	TSHE/VACCI/POMU	Vaccinium spp. Polystichum munitum	blueberry sword fern
200	TSHE-CHNO Series	Tsuga heterophylla -Chamecyparis nootkatensis	Western hemlock -Alaska cedar
210	TSHE-CHNO/VACCI	/Vaccinium spp.	/blueberry
220	TSHE-CHNO/VACCI/LYAM	/Vaccinium spp. /Lysichitum americanum	/blueberry /skunk cabbage
250	TSHE-CHNO/VACC-OPHO	/Vaccinium spp /Oplopanax horridum	/blueberry /devilsclub
300	PISI Series	Picea sitchensis	Sitka spruce
305	PISI/MYGA/CAREX	/Myrica gale/Carex	/sweet gale/ sedge
310	PISI/VACCI	/Vaccinium spp.	/blueberry
315	PISI/SALIX	/Salix	/willow
320	PISI/VACCI-OPHO	/Vaccinium spp. /Oplopanax horridium	/blueberry -devil's club
325	PISI/VACCI-SALIX	/Vaccinium spp. -Salix spp.	/blueberry -willow
330	PISI/OPHO	/Oplopanax	/devil's club
340	PISI/OPHO/LYAM	/Oplopanax horridium /Lysichitum americanum	/devil's club /skunk cabbage
350	PISI/ALNUS	/Alnus spp.	/alder
360	PISI/CANU	/Calamagrostis nutkaensis	/Pacific reedgrass
370	PISI/VACCI/LYAM	/Vaccinium/ Lysichitum americanum	/blueberry /skunk cabbage
380	PISI/RUSP	Rubus spectabilis	/salmonberry
390	PISI/MOSS	Moss spp.	moss

400	MIXED CONIFER Series	Mixed Conifer	Mixed Conifer
410	MXD CON/VACCI	/Vaccinium spp.	/blueberry
420	MXD CON/VACCI/LYAM	/Vaccinium spp.	/blueberry
		/Lysichitum americanum	/skunk cabbage
430	MXD CON/VACCI/FACR	/Vaccinium spp.	/blueberry
		/Fauria crista-galli	/deer cabbage
440	MXD CON/LYAM-ATFI	/Lysichitum americanum	/skunk cabbage
		-Athyrium filix-femina	-lady fern
450	MXD CON/GASH/FACR	/Gaultheria shallon	/salal
		/Fauria crista-galli	/deer cabbage
460	MXD CON/VACCI-GASH	/Vaccinium spp	/blueberry
		/Gaultheria shallon	/salal
470	MXD CON/GASH/LYAM	/Gaultheria shallon	/salal
		/Lysichitum americanum	/skunk cabbage
480	MXD CON/GASH	/Gaultheria shallon	/salal
500	TSME Series	Tsuga heterophylla	Mountain hemlock
510	TSME/VACCI	/Vaccinium spp.	/blueberry
520	TSME/VACCI-CLPY	/Vaccinium spp.	/blueberry
		-Cladothamnus pyrolaeflorus	-copper bush
530	TSME/VACCI-CAME	/Vaccinium spp.	/blueberry
		-Cassiope mertensiana	-Mertens cassiope
540	TSME/VACCI/VEVI	/Vaccinium spp.	/blueberry
		/Veratrum viride	/false hellebore
600	PICO Series	Pinus contorta	Shore Pine
610	PICO/EMNI	/Empetrum nigrum	/crowberry
700	TSHE-THPL Series	Tsuga heterophylla-Thuja plicata	
710	TSHE-THPL/VACCI	/Vaccinium spp	/blueberry
720	TSHE-THPL/POMU	/Polystichum munitum	/swordfern
730	TSHE-THPL/VACCI/LYAM	/Vaccinium spp	/blueberry
		/Lysichitum americanum	/skunk cabbage
740	TSHE-THPL/OPHO/POMU	/Oplopanax horridum	/devilsclub
		/Polystichum munitum	/swordfern
750	TSHE-THPL/VACCI-OPHO	/Vaccinium spp	/blueberry
		/Oplopanax horridum	/devilsclub
760	TSHE-THPL/VACCI-GASH	/Vaccinium spp	/blueberry
		/Gaultheria shallon	/salal
770	TSHE-THPL/GASH-LYAM	/Gaultheria shallon	/salal
		/Lysichitum americanum	/skunk cabbage
780	TSHE-THPL/GASH	/Gaultheria shallon	/salal
790	TSHE-THPL/OPHO/LYAM	/Oplopanax horridum	/devilsclub
		/Lysichitum americanum	/skunk cabbage
800	PISI-POTR Series	Picea sitchensis-Populus trichocarpa	
810	PISI-POTR/ALNUS	/Alnus spp.	/alder
820	PISI-POTR/SALIX	/Salix spp.	/willow
830	PISI-POTR/OPHO	/Oplopanax horridum	/devil's club
840	PISI-POTR/ALNUS/OPHO	/Alnus spp.	/alder
		/Oplopanax horridum	/devil's club
850	PISI-POTR/VACCI-OPHO	/Vaccinium spp.	/blueberry
		-Oplopanax horridum	-devil's club

VEGETATION CODES FOR NONFOREST PLANT ASSOCIATIONS

ABBRE-VIATION	CODE	GENUS AND SPECIES	COMMON NAME
		OVERSTORY	
ALRU	01	ALNUS RUBRA	RED ALDER
		UNDERSTORY	
ALSI	25	ALNUS SINUATA	SITKA ALDER
CLPY	40	CLADOTHAMNUS PYROLAEFLORUS	COPPERBUSH
COST	05	CORNUS STOLONIFERA	RED OSIER DOGWOOD
LUPE	10	LUETKEA PECTINATA	LUETKEA
MEFE	55	MENZIESIA FERRUGINEA	RUSTY MENZIESIA
OPHO	45	OPLOPANAX HORRIDUM	DEVIL'S CLUB
RI	60	RIBES _____	CURRANT/GOOSEBERRY
RUPA	03	RUBUS PARVIFLORUS	THIMBLE BERRY
RUSP	35	RUBUS SPECTABILIS	SALMONBERRY
SALIX	20	SALIX SPP.	WILLOW
SARA	07	SAMBUCUS RACEMOSA	RED ELDERBERRY
VACCI	50	VACCINIUM OVAL./ALASKEN.	BLUEBERRY
VAPA	02	VACCINIUM PARVIFOLIUM	RED HUCKLEBERRY
VIED	04	VIBURNUM EDULE	HIGH BUSH CRANBERRY
		GRASS/FORB LAYER	
ATFI	51	ATHYRIUM FILIX-FEMINA	LADY FERN
ARNIC	52	ARNICA SPP.	ARNICA
CABI	53	CALTHA BIFLORA	MARSH MARIGOLD
CIAL	54	CIRCAEA ALPINA	ENCHANTER'S NIGHTSHADE
CLUN	93	CLINTONIA UNIFLORA	BLUE-BEAD
COTR2	56	COPTIS TRIFOLIA	TRIFOLIATE GOLDTHREAD
COCA	57	CORNUS CANADENSIS	BUNCHBERRY, DOGWOOD
DODEC	58	DODECATHEON SPP.	SHOOTING STAR
EP	59	EPILOBIUM	FIREWEED
EQUIS	65	EQUISETUM SPP.	HORSETAIL
FACR	61	FAURIA CRISTA-GALLI	DEER CABBAGE
GA	62	GALIUM_____	BEDSTRAW
GEDO	63	GENTIANA DOUGLASIANA	SWAMP GENTIAN
GEPL	64	GENTIANA PLATYPETALA	BLUE GENTIAN
GECA4	66	GEUM CALTHIFOLIUM	CALTHA-LEAF AVENS
HELA	67	HERACLEUM LANATUM	COW PARSNIP
HIMO	68	HIPPURIS MONTANA	MOUNTAIN MARESTAIL
LI	69	LISTERA _____	TWAYBLADE
LYAM	71	LYSICHITUM AMERICANUM	YELLOW SKUNK CABBAGE
MADI2	72	MAIANTHEMUM DIALATATUM	DEERBERRY
MOUN	73	MONESES UNIFLORA	SINGLE DELIGHT
OS	74	OSMORHIZA _____	SWEET CICELY

ABBRE-VIATION	CODE	GENUS AND SPECIES	COMMON NAME
PAFI	76	PARNASSIA FIMBRIATA	GRASS OF PARNASSUS
PIVU	77	PINGUICULA VULGARIS	COMMON BUTTERWORT
PRAL	78	PRENANTHES ALATA	RATTLESNAKE ROOT
PTAQ	79	PTERIDIUM AQUILINUM	WESTERN BRACKEN FERN
PYAS	81	PYROLA ASARIFOLICE _	WINTERGREEN
RA	82	RANUNCULUS _____	BUTTERCUP
RUPE	83	RUBUS PEDATUS	FIVE-LEAF BRAMBLE
SA	84	SANGUISORBA _____	BURNET
SA	85	SAXIFRAGA _____	SAXIFRAGE
STAM	86	STREPTOPUS AMPLEXIFOLIUS	CLASPING TWISTED-STALK
STRO	87	STREPTOPUS ROSEUS	ROSY TWISTED-STALK
TITR	88	TIARELLA TRIFOLIATA	TRIFOLIATE FOAMFLOWER
VASI	89	VALERIANA SITCHENSIS	SITKA VALERIAN
VEVI	90	VERATRUM VIRIDE	FALSE HELLEBORE
VIGL	91	VIOLA GLABELLA.	STREAM VIOLET
VILA	92	VIOLA LANGSDORFFII	ALASKA VIOLET
		ESTUARINE	
E1	11		SPARSELY VEGETATED MUDFLAT
E2	12		ESTUARINE SEDGE MARSHLAND
E3	13		MIXED FORB GRASSLAND
		ALPINE	
A1	21		ALPINE MEADOW
		MUSKEG	
M1	15		SEDGE AND SPHAGNUM
M2	30		MYRICA GALE
M3	31		SCOURING RUSH
		OTHER	
	70		BARE ROCK
	75		BARE ALLUVIUM
	80		CLEARCUT

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