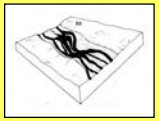
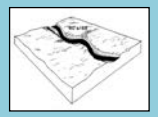
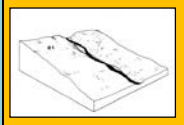
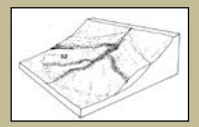
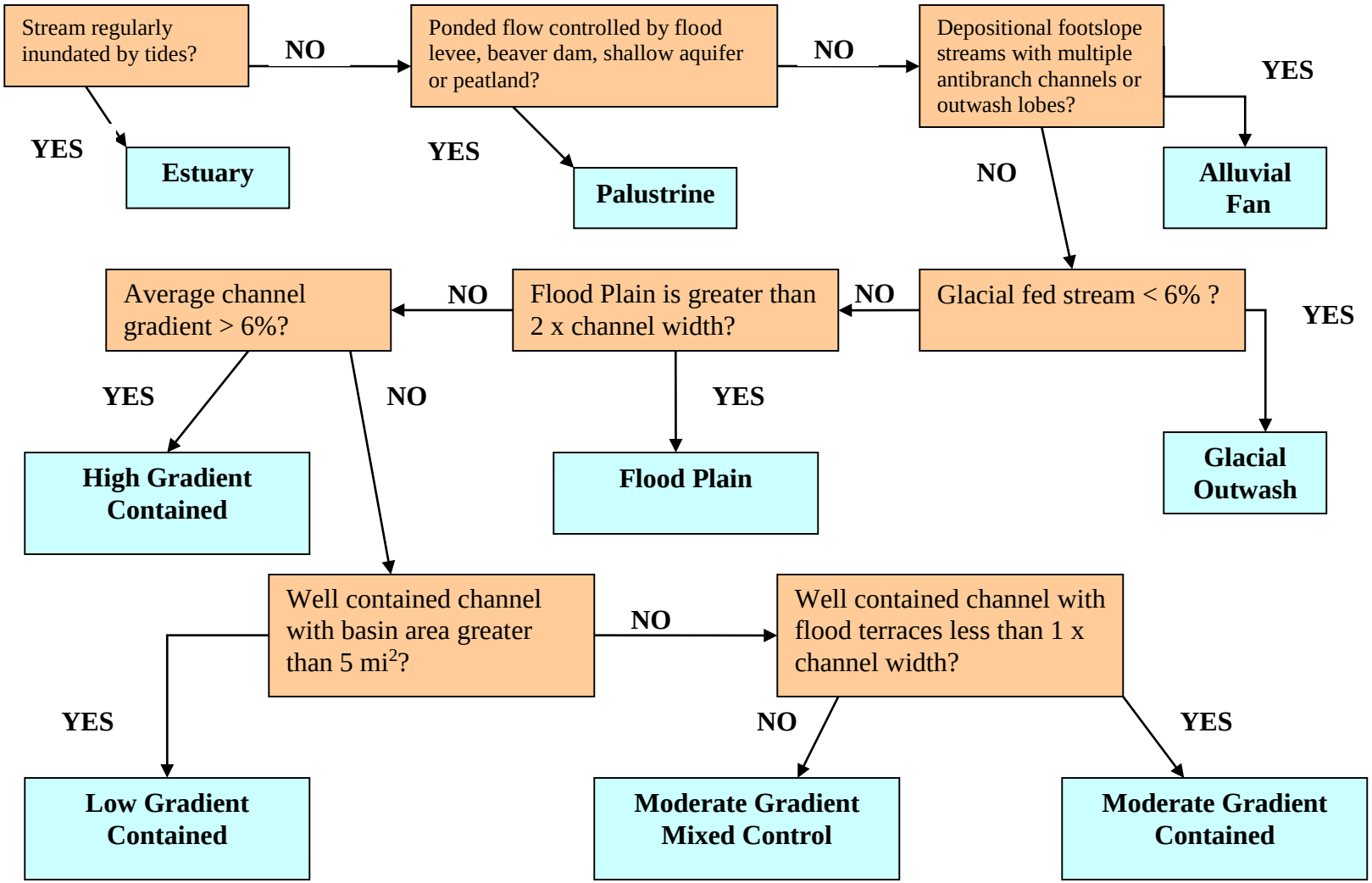
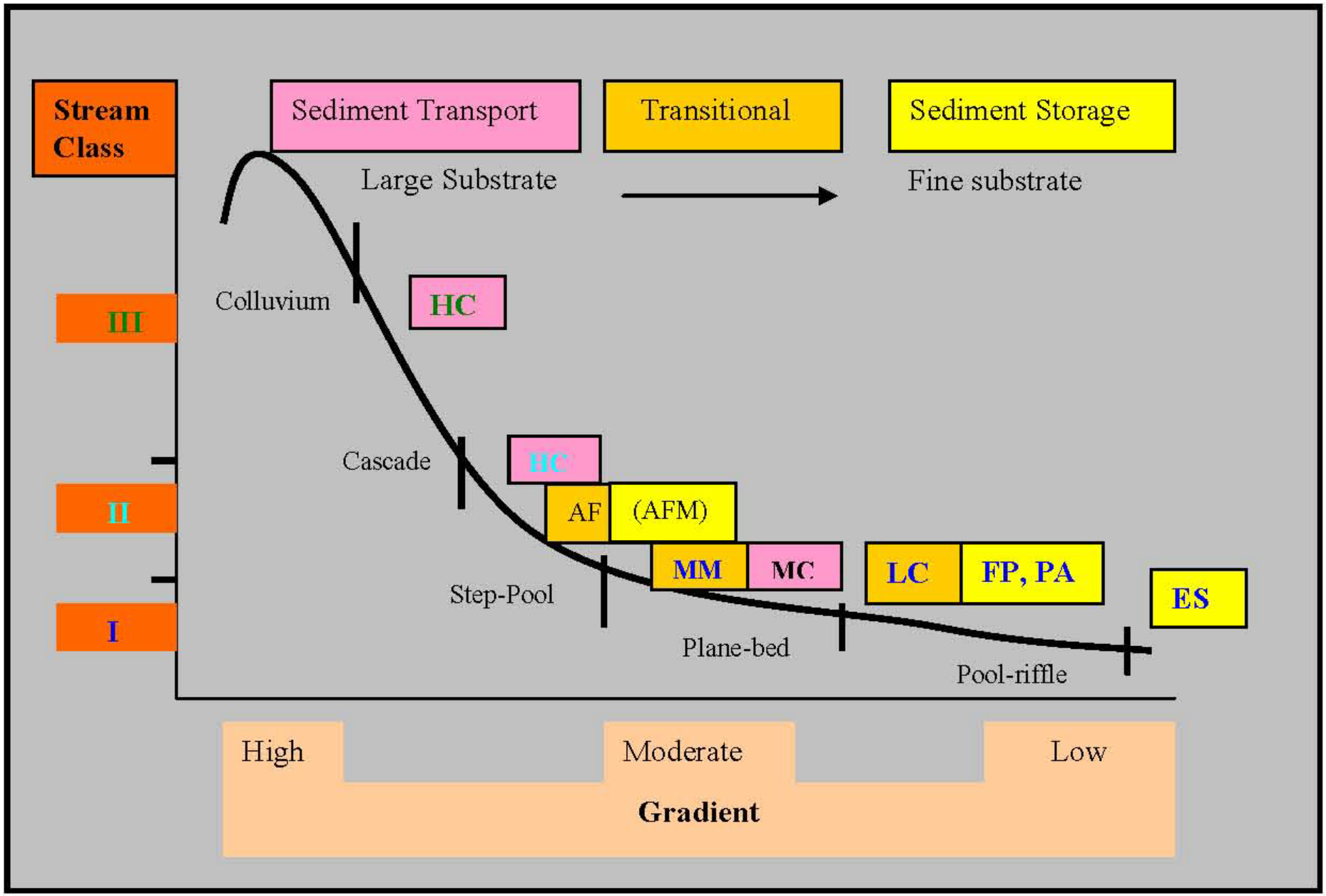
R10 Channel Type Field Guide

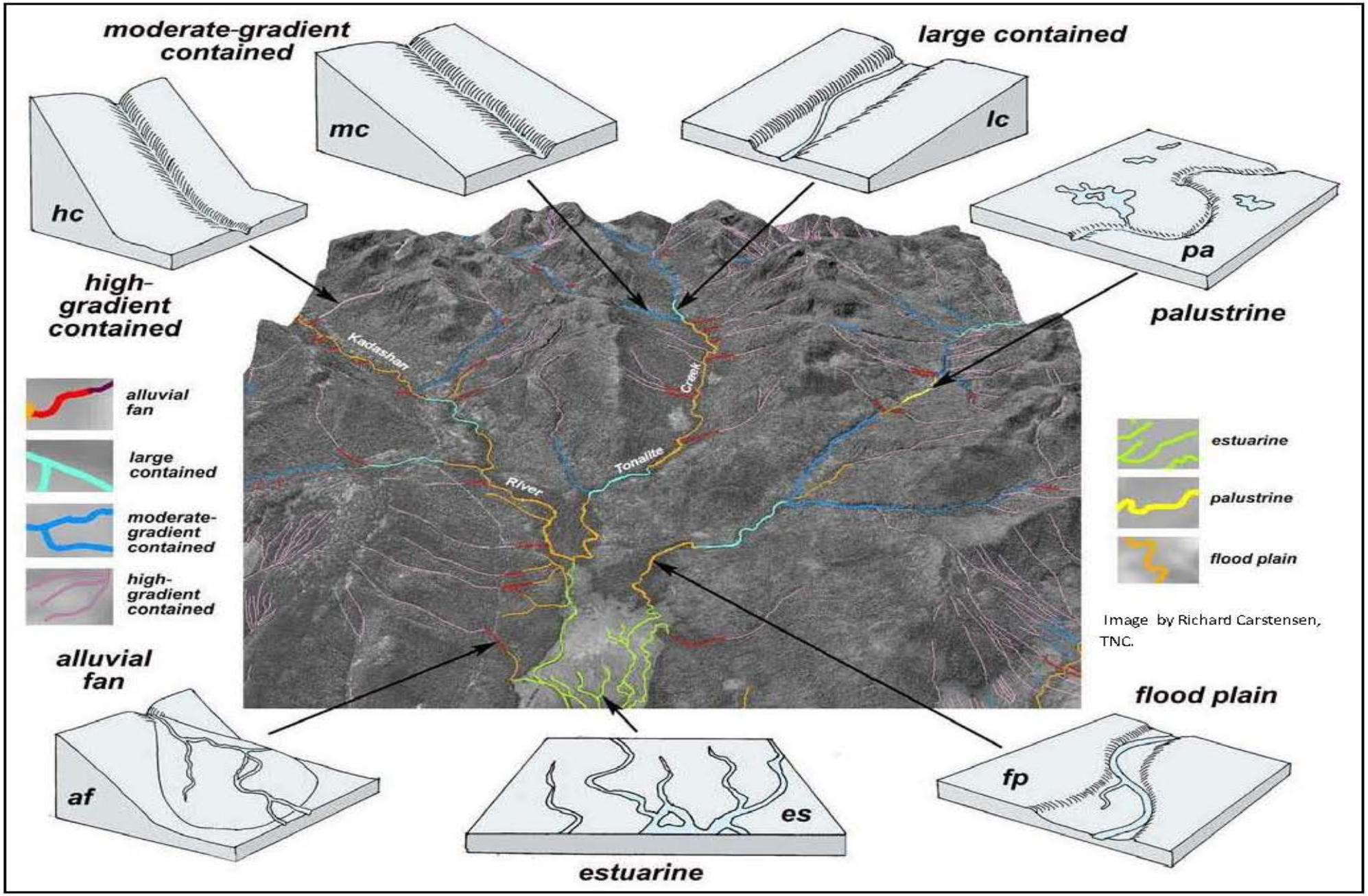
Revised 2014

Process Group	ES	PA	GO	FP	LC	MC	AF	MM	HC
Isosmetric diagrams									
Gradient	**0-3%**	**< 1%**	**Variable**	**0-2%**	**0-2%**	**2-6%**	**Variable**	**2-6%**	**> 6 %**
Typical Confinement	Unconfined	Unconfined	Unconfined, braided	Unconfined	Confined	Confined	Unconfined, multibranch	Variable	Confined
Landscape position	Estuary, tidal deltas	Peatland-bog wetlands, valley bottom	Glacial valleys	Valley bottom, flood plain	Lowlands and valley bottoms	Footslopes, lowlands, valley bottom	Depositional footslopes	Valley bottom, footslope	Steep mountain slope
Sediment Function	Intertidal deposition processes dominate.	Organic and fine sediment storage	Extensive, dynamic flood plains, storage function	Complex depositional channel networks	Sediment transport, pocket storage	Sediment transport, with pocket storage	Episodic deposition processes	Transitional transport/ deposition channels influence by bedrock control and riparian vegetation.	Source and transport system
Stream Class	**1**	**1, 2**	**1, 2, 3**	**1, 2**	**1, 2**	**1, 2**	**1, 2,3,4**	**1, 2**	**1,2, 3, 4**
Fish Habitat	Highly productive anadromous spawning habitat	High juvenile rearing potential	Fish habitat concentrated in channel margins and side channels	Diverse and productive anadromous spawning and rearing habitat	Moderately productive resident and anadromous fish habitats	Resident and anadromous habitats with variable productivity	Low productivity due to dynamic channels and interrupted surface flow	Moderate to Highly Productive Anadromous and Resident fish habitat	Small resident populations
Montgomery and Buffington	Braided/ variable	Pool-riffle	Braided	Pool-riffle, forced pool-riffle	Bedrock, plane-bed, pool-riffle	Bedrock, step-pool	Cascade, forced step-pool	Plane-bed, riffle- bed, forced pool-riffle	Colluvial, Cascade

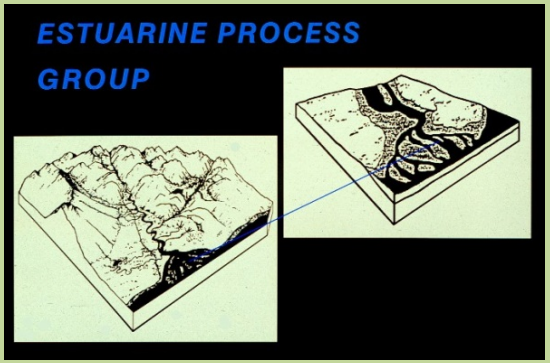
Key to Alaska Region Stream Process Groups

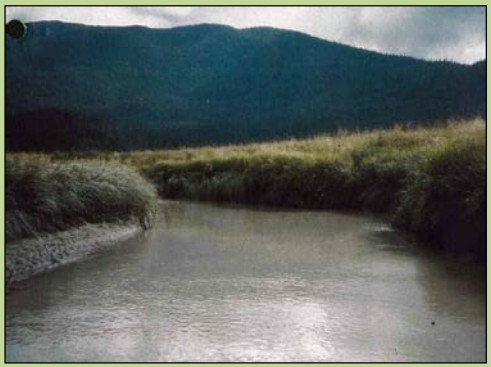



Stream Class
Sediment Transport
Transitional
Sediment Storage
Large Substrate
Fine substrate
III
II
I
Colluvium
HC
Cascade
HC
AF
(AFM)
MM
MC
LC
FP, PA
ES
Step-Pool
Plane-bed
Pool-riffle
High
Moderate
Low
Gradient


moderate-gradient contained
mc
large contained
lc
hc
pa
high-gradient contained
palustrine
Kadashan
Creek
River
Tonalite
alluvial fan
large contained
moderate-gradient contained
high-gradient contained
estuarine
palustrine
flood plain
Image by Richard Carstensen, TNC.
alluvial fan
af
es
flood plain
fp
estuarine

Estuarine Process Group





Associated landform: 71

ESSf - Small, Silt Substrate Estuarine Channel or Slough (former-ES1)

An estuarine silt substrate channel.

Stream Gradient: <0.5%

Incision Depth: <4 m (13 ft)

Bankfull Width: <20 m (66 ft)

Dominant Substrate: Silt/clay to sand

Plant Association: Nonforested, with S.Spruce/Cottonwood significant

Similar Channel Types:
FPS: associated with beach/dune landforms, sand substrate
FPB: not in intertidal zone
ESSg: sand substrate, mountain runoff, <10m wide
GES: very broad anastomosized channel, associated with glacial outwash channels

ESSg - Narrow Small, Sand to Gravel Substrate Estuarine Channel (former-ES2)

A narrow, low gradient, shallowly incised channel. Quality habitat >ESSc.

Stream Gradient: ≤ 1%

Incision Depth: <3 m (10 ft)

Bankfull Width: Variable, usually <10 m (33 ft)

Dominant Substrate: Sand to gravel

Plant Association: Nonforested - forbs & grasses, W.Hemlock significant

Similar Channel Types:
ESL: width >10 m (33 ft) ESSc: steeper gradient up to 3%, larger substrate

ESSc- Narrow Large, Coarse Gravel to Boulders Substrate Estuarine Channel (former -ES3)

A low gradient, shallowly incised, small rocky channel with small bars.

Stream Gradient: <3%

Incision Depth: <3 m (10 ft)

Bankfull Width: Variable, usually <10 m

Dominant Substrate: Fine gravel to small boulder

Plant Association: Nonforested - forbs & grasses, Sitka Spruce significant

Similar Channel Types:
ESL: gradient <2%, width >10 m (33 ft)
ESSg: gradient <1%, finer substrate

Stream Gradient: <0.5 to 3%
Sediment Function: Storage
Stream Class: I and II

ESO-Micro Estuarine Channel
Bankfull Width: 0.3-1.5m (1 to 5 ft)
No photo

Fish Habitat: Highly productive anadromous spawning habitat

R10 Channel Type Complete List

Values	Description
AFO	Micro Alluvial Fan Channel
AFM	Moderate Gradient Alluvial Fan Channel
AFH	High Gradient Alluvial Cone Channel
ESO	Micro Estuarine Channel
ESS	Small Estuarine Channel
ESSs	Small Estuarine Channel – Sand/Silt Substrate Phase
ESSg	Small Estuarine Channel – Gravel Substrate Phase
ESSc	Small Estuarine Channel – Cobble/Boulder Phase
ESM	Medium Estuarine Channel
ESL	Large Estuarine Channel
ESLd	Sand dune association
FPO	Micro Flood Plain Channel
FPB	Foreland Uplifted Beach Channel
FPBf	Foreland Uplifted Beach Channel – Foreland Forested Phase
FPBh	Foreland Uplifted Beach Channel – Shrub, Non-forested Phase
FPE	Foreland Uplifted Estuarine Channel
FPEf	Foreland Uplifted Estuarine Channel – Foreland Forested Phase
FPEh	Foreland Uplifted Estuarine Channel – Shrub, Non-forested Phase
FPEv	Foreland Uplifted Estuarine Channel – Scrub Phase
FPS	Small Flood Plain Channel
FPSf	Small Flood Plain Channel – Foreland Forested Phase
FPSw	Small Flood Plain Channel – Wetland Phase
FPSh	Small Flood Plain Channel – Shrub, Non-forested Phase
FPM	Medium Flood Plain Channel
FPMa	Medium Flood Plain Channel – Volcanic Ash Phase
FPMf	Medium Flood Plain Channel – Foreland Outwash Forested Phase
FPMc	Medium Flood Plain Channel – Boulder or Cobble Substrate Phase
FPMw	Medium Flood Plain Channel – Wetland Phase
FPMh	Medium Flood Plain Channel – Foreland Outwash Shrub Phase
FPL	Large Flood Plain Channel
FPLr	Large Flood Plain Channel – Bedrock Phase
FPLf	Large Flood Plain Channel – Foreland Outwash Forested Phase
FPLc	Large Flood Plain Channel – Boulder or Cobble Substrate Phase
FPLw	Large Flood Plain Channel – Wetland Phase
FPLh	Large Flood Plain Channel – Foreland Outwash Shrub Phase
GAF	Glacial Alluvial Fan Channel
GES	Glacial Estuarine Channel
GSC	Glacial Outwash Side Channel
GOL	Large Meandering Glacial Outwash Channel
GOB	Large Braided Glacial Outwash Channel
GOM	Medium Glacial Outwash Channel
GOC	Glacial Cirque Channel
GOS	Small Glacial Outwash Channel
HCO	Micro High Gradient Contained Channel
HCLw	High Gradient Contained Low Incision Channel – Wetland Phase
HCL	High Gradient Contained Low Incision Channel
HCLw	High Gradient Contained Low Incision Channel – Wetland Phase
HCV	High Gradient Contained Upper Valley Channel
HCVw	High Gradient Contained Upper Valley Channel – Wetland Phase
HCDw	High Gradient Contained Deep Incision Channel – Wetland Phase
HCM	High Gradient Contained Moderate Incision Channel
HCD	High Gradient Contained Deep Incision Channel
HCVi,	High Gradient Contained Upper Valley Channel – Glacial/Debris Flow Phase
HCDi	High Gradient Contained Deep Incision Channel – Glacial/Debris Flow Phase
ICE	Artificial connector under glacier, position unknown
L	Lake – Connector
K	Karst – Subterranean Connector
LCM	Medium Low Gradient Contained Channel
LCMl	Medium Low Gradient Contained Channel – Glide Phase
LCS	Small Low Gradient Contained Channel
LCL	Large Low Gradient Contained Channel
MCD	Deep incision Moderate Gradient Contained
MCS	Small Moderate Gradient Contained Channel
MCSw	Small Moderate Gradient Contained Channel – Wetland Phase
MCM	Medium Moderate Gradient Contained Channel
MCMr	Medium Moderate Gradient Contained Channel – Bedrock Phase
MCL	Large Moderate Gradient Contained Channel
MMO	Micro Moderate Gradient Contained Channel
MMS	Small Moderate Gradient Contained Channel
MMM	Medium Moderate Gradient Contained Channel
MMMw	Medium Moderate Gradient Contained Channel – Wetland Phase
MMMh	Medium Moderate Gradient Contained Channel – Shrub, Non-forested Phase
MML	Large Moderate Gradient Contained Channel
PAO	Micro Palustrine Channel
PAS	Small Palustrine Channel
PASv	Small Palustrine Channel – Scrub Forest Phase
PAM	Medium Palustrine Channel
PAMw	Medium Palustrine Channel – Wetland Phase
PAH	Backwater Groundwater Fed Slough
PAG	Backwater Glacial Slough
PAB	Beaver Dam/Pond Channel
PAL	Large Palustrine Channel
UAN	Unidentified Annette Island stream arc
ICE	Artificial connector under glacier, position unknown
L	Lake – Connector
K	Karst – Subterranean Connector
LCM	Medium Low Gradient Contained Channel

Estuarine Process Group

ESL - Large Estuarine Channel
(former -ES4)

A large, low gradient, shallowly incised, alluvial-tidal zone channel.

Stream Gradient: < 2%

Incision Depth: < 5 m (16.5 ft)

Bankfull Width: > 10 m (33 ft)

Dominant Substrate: Gravel to cobble

Plant Association: Nonforested - sedges & grasses
Phases: ESLd

Similar Channel Types:
ESSc: width <10 m (33 ft), larger substrate ESSg: width <10 m (33 ft),
GES: active glaciers in drainage basin, FPM: not associated with estuary

GES - Broad Braided Glacial Outwash Estuarine Channel
(former -ES8)

A very wide, shallow, braided, tidal zone, glacial melt water channel.

Stream Gradient: < 1.5%

Incision Depth: < 2 m (6.6 ft)

Bankfull Width: Variable, normally a very wide, braided delta

Dominant Substrate: Sand to coarse gravel

Plant Association: Salt tolerant grasses and sedges

Similar Channel Types:
GOB: not subject to tidal influence
ESL: not associated with glacial systems

Palustrine Process Group

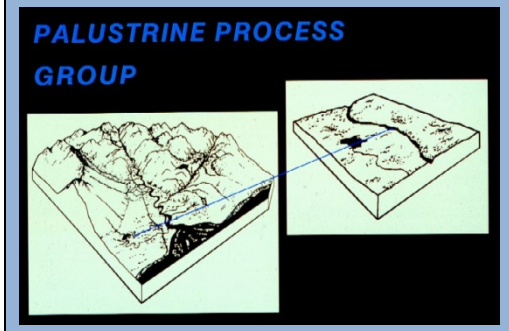


Photo: PAL

Associated landforms: 40's, 50's, 60's

PA0 - Micro Placid Flow Channel

A low gradient, placid flow, bog or fen channel normally associated with footslope and flood plain channels.

Stream Gradient: < 1 %

Incision Depth: < 1m (<3 ft)

Bankfull Width: approximately 0.3 to 2 m (mean = 1.3m*) (1 to 6.5 ft)

Dominant Substrate: Organic muck/silt to fine gravel

Stream Bank Composition: Organic material

Plant association: Non-forested - Alder, sedge

PAS - Narrow Placid Flow Channel (former-PA1)

A low gradient, placid flow, shallowly incised, muskeg lowland channel, associated with ponds.

Stream Gradient: < 1 %

Incision Depth: ≤ 2 m (6.6 ft)

Bankfull Width: 1.5 to < 10 m (33 ft)

Dominant Substrate: Organic silt to very fine gravel

Stream Bank Composition: Alluvium and/or organic mat

Plant Association: Nonforested - sedge, sphagnum, and sweet gale

PAM - Moderate Width Placid Flow Channel
(former –PA2)

A wide, deep, low gradient, shallowly incised channel, associated with lake outlets on lowland flood plains.

Stream Gradient: < 1 %

Incision Depth: ≤ 2 m (6.6 ft)

Bankfull Width: > 10 m (33 ft)

Dominant Substrate: Organic silt, sand, fine gravel

Stream Bank Composition: Alluvium/organic mat

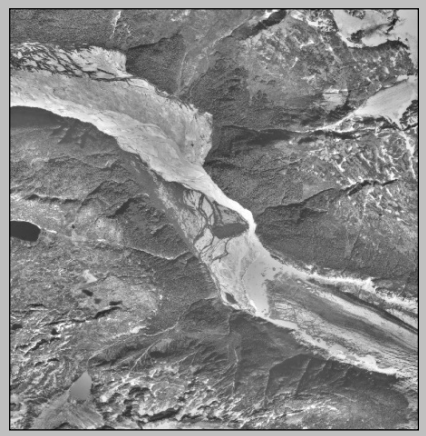
Plant Association: Nonforested, Shore Pine/crowberry & Sit.Spruce significant
Similar Channel Types: PA1: width <10 m (33 ft) PA5: beaver dam

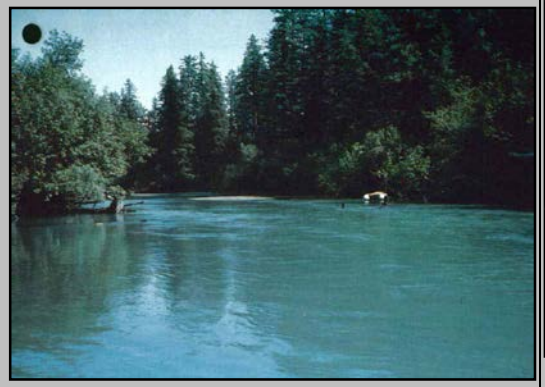
Stream Gradient: < 1%
Sediment Function: Storage
Stream Class: I or II

PAL- Large Palustrine Channel
Bankfull width: > 20m (66 ft)
Photo up and left

Fish Habitat: High juvenile rearing potential

Glacial Outwash Process Group





Associated Landforms: 53, 63, 64

GOI - Glacial Outwash Flood Plain Side Channel
(former -GO1)

A secondary, glacial outwash, overflow channel.

Stream Gradient: < 1%

Incision Depth: < 4 m (13 ft)

Bankfull Width: 10-200 m (33 to 660 ft)
Dominant Substrate: Sand to coarse gravel
Stream Bank Composition: Alluvium

Sideslope Length/Angle: Not significant except in glacial moraine deposits.

Plant Association: Nonforest alder, willow, & cottonwood, S.Spruce/Devil's club

GOL - Large Meandering Glacial Outwash Channel
(former - GO2)

A wide singular glacial silt laden channel in broad glacial outwash valleys.
Stream Gradient: < 3%

Incision Depth: ≤ 4 m (13 ft)

Bankfull Width: Variable, can be > 50 m (165 ft)
Dominant Substrate: Coarse gravel to small boulder
Stream Bank Composition: Alluvium

Sideslope Length/Angle: Not significant except where the channel cuts through remnant glacial moraine deposits.
Plant Association: Nonforested, Mt.Hemlock/Cassiope, S.Spruce-Cottonwood

GOB -Large Braided Glacial Outwash Channel
(former - GO3)

A very wide, highly braided, glacial outwash plain channel.

Stream Gradient: < 3%

Incision Depth: ≤ 2 m (6.6 ft)
Bankfull Width: 60- > 300 m (196 to >990 ft)
Dominant Substrate: Coarse gravel to large cobble
Stream Bank Composition: Alluvium
Sideslope Length/Angle: Not significant except in glacial moraine deposits

Plant Assoc:Nonforest-S.Alder& Willow, S.Spruce-Cottonwood/Alder

Stream Gradient: <1 to 6%
Sediment Function: Moderate, deposition dominates, suspended sediment load is high
Stream Class: I, II, III (GOC)

Fish Habitat: Concentrated in channel margins and side channels

Palustrine Process Group

PAH – Backwater/Groundwater Fed Slough
(formerly-PA3)

A low velocity, groundwater recharge slough in remnant glacial braided channels.

Stream Gradient: < 1 %

Incision Depth: ≤ 4 m (13 ft)

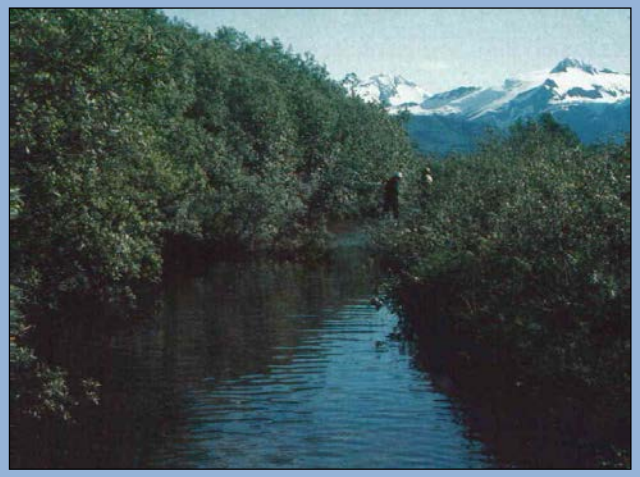
Bankfull Width: Variable, may be >10 m (33 ft)

Dominant Substrate: Silt to fine gravel

Stream Bank Composition: Alluvium

Sideslope Length/Angle: Not significant, except in glacial moraine deposits

Plant Association: Sitka Spruce series and Nonforested



PAG – Glacial Backwater Slough
(formerly PA4)

A low velocity glacial stream fed slough

Same characteristics as PAH

Stream Gradient: < 1 %

Incision Depth: ≤ 4 m (13 ft)

Bankfull Width: Variable, may be >10 m (33 ft)

PA5 - Beaver Dam/Pond Channel
(formerly-PA5)

A consequence of beaver activity, creating pond chain complex.

Stream Gradient: < 1 %

Incision Depth: ≤ 2 m (6.6 ft)

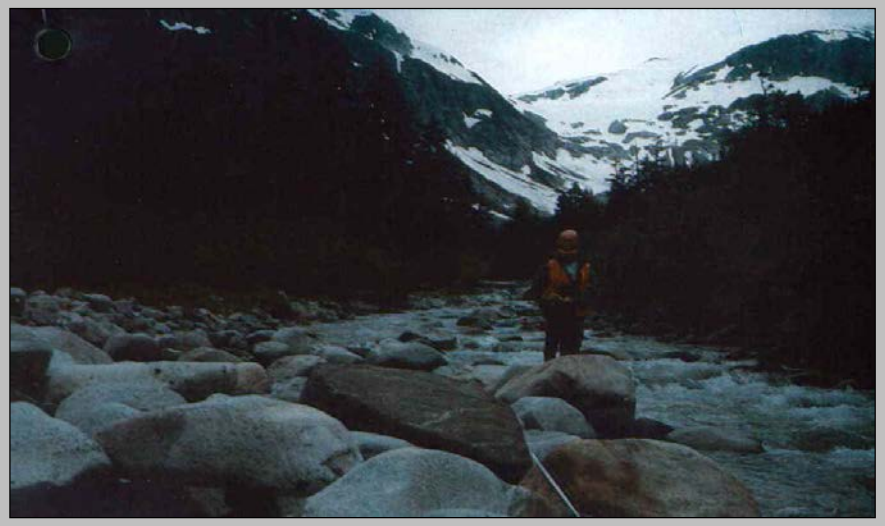
Bankfull Width: Variable, usually >10 m (33 ft) can be < 10m

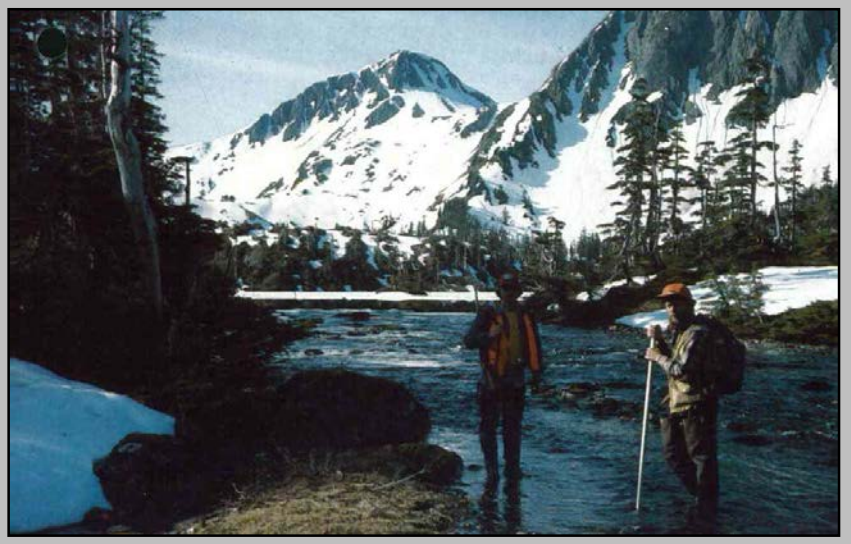
Dominant Substrate: Organic silt to sand

Stream Bank Composition: Organic material

Plant Association: Nonforested, S.Spruce, Shore Pine, dead tree zone

Glacial Outwash Process Group





GOM - Moderate Width Glacial Channel (former - GO4)

A variable width, moderate gradient, glacial silt, mid-valley channel.

Stream Gradient: 2-6 %

Incision Depth: < or = 4 m (13 ft)

Bankfull Width: Variable, mean = 31 m (102 ft)

Dominant Substrate: Coarse gravel to small boulder

Stream Bank Composition: Alluvium or mixed

Sideslope Length/Angle: variable/<25%

Plant Association: Nonforest Alder and Willow

GOC - Cirque Channel (former - GO5)

A low to moderate gradient, single to braided channel, situated in upper valley cirque basins or hanging valleys.

Stream Gradient: <6 %

Incision Depth: ≤2 m (6.6 ft)

Bankfull Width: Variable, single or multiple channels

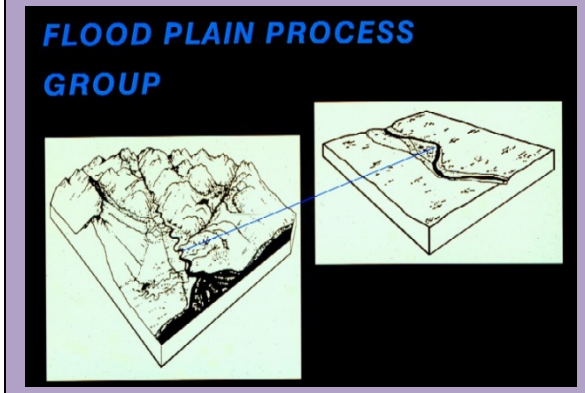
Dominant Substrate: Broad range, from bedrock to silt

Stream Bank Composition: Alluvium or colluvium

Sideslope Length/Angle: Not significant

Plant Association: Nonforest alpine meadow, S.Alder & willow, Mt.Hemlock/cassiope

Flood Plain Process Group



Associated Landforms: 53, 61, 62

FPO - Micro Flood Plain Channel

A very narrow, low gradient, forested valley bottom channel usually situated in the riparian zone of larger Flood Plain channels. The FP0 may connect small scale footslope or palustrine channels to the main valley bottom stream. The minute size of this channel renders it undetectable on resource aerial photography.

Stream Gradient: < 2 %
Incision Depth: < 2 m (6.6 ft)
Bankfull Width: approximately 0.3 to 1.5m (1 to 5 ft)
Dominant Substrate: Silt to coarse gravel.
Stream Bank Composition: Sand to coarse gravel.
Sideslope Length/Angle: not significant
Plant Association:
Riparian Vegetation: Overstory = S.Spruce, W.Hemlock; Understory = Blueberry, Devil's Club.

FPS - Narrow Low Gradient Flood Plain Channel (former –FP3)

A low gradient, shallowly incised, forested lowland channel.

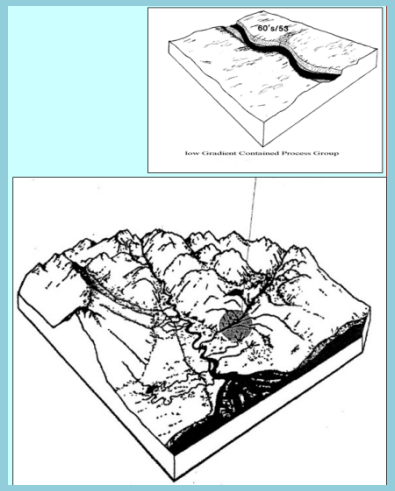
Stream Gradient: < 2 %
Incision Depth: ≤ 2 m (6.6 ft)
Bankfull Width: 1.5 to10 m (5-33 ft)

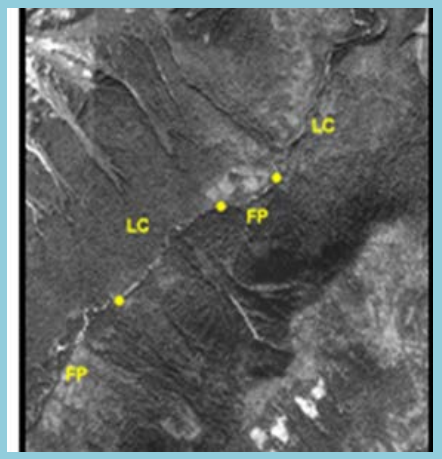
Dominant Substrate: Sand to small rubble
Stream Bank Composition: Sand to coarse gravel
Sideslope Length/Angle: Not significant
Plant Association: S.Spruce, W. Hemlock, Mixed Conifer
Phases: FPSa, FPSf, FPSw, FPSs
Similar Channel Types:
MMS or MMM: gradient 2-6%
FPM: 10-20 m (33-66 ft) wide
MCS: gradient 2-6%, bedrock control
AFM: gradient variable, 52 landform

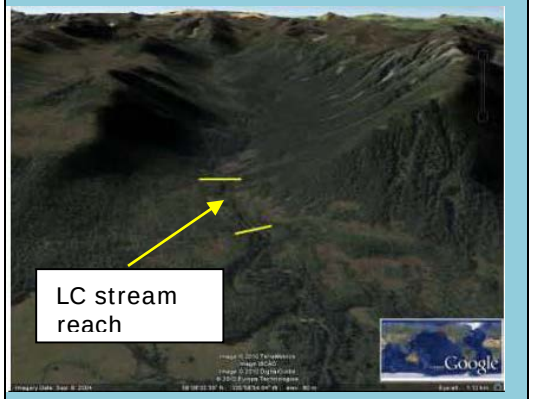
Stream Gradient: < 2%
Sediment Function: Storage
Stream Class: I or II

Fish Habitat: Diverse and productive anadromous spawning and rearing habitat.

Low Gradient Contained Process Group







Associated landforms: 30,40s,50's,60's

<u>LCS-</u> Small Low Gradient Contained
A low gradient, small width bedrock controlled lowland muskeg channel, bars often present.

<u>Stream Gradient:</u> 0-2%
<u>Incision Depth</u>: < 10m (33ft)
<u>Bankfull Width</u>: < 10m (33ft)

<u>Dominant Substrate</u>: Coarse gravel to bedrock
<u>Stream Bank Composition</u>: Bedrock or mixed
<u>Sideslope length</u>: < 20m (66ft)
<u>Sideslope angle</u>: < 50%
<u>Plant Associations</u>: W.hem/b.berry, mixed conifers, SitkaSpruce/blueberry

LCM- Low Gradient Contained (former –LC1)
A low gradient, small width bedrock controlled lowland muskeg channel, bars often present

<u>Stream Gradient:</u> 0-2%
<u>Incision Depth</u>: < 10m (33ft)
<u>Bankfull Width</u>: < 20m (66ft)

<u>Dominant Substrate</u>: Coarse gravel to bedrock
<u>Stream Bank Composition</u>: Bedrock or mixed
<u>Sideslope length</u>: < 20m (66ft)
<u>Sideslope angle</u>: < 50%
<u>Plant Associations</u>: W.hem/b.berry, mixed conifers, SitkaSpruce/blueberry

<u>LCL-</u> Large Low Gradient Contained Channel
A wide low gradient, contained valley bottom channel.

<u>Stream Gradient:</u> 0-2%
<u>Incision Depth</u>: < 10m (33ft)
<u>Bankfull Width</u>: > 20m (66ft)

<u>Dominant Substrate</u>: Coarse gravel to bedrock
<u>Stream Bank Composition</u>: Bedrock or mixed
<u>Sideslope length</u>: < 20m (66ft)
<u>Sideslope angle</u>: < 50%
<u>Plant Associations</u>: W.hem/b.berry, mixed conifers, SitkaSpruce/blueberry/Devil's Club

Stream gradient: 0 to 2%
Sediment Function: Mixed function, temporary storage
Stream Class: I and II

<u>Fish Habitat:</u> Moderately productive resident and anadromous fish habitat.

Flood Plain Process Group

FPM-Moderate Width Low Gradient Floodplain Channel
(former –FP4)

A low gradient, sinuous, multiple channel flood plain stream.
Bar deposits and overflow channelways are frequent.

Stream Gradient: < 2 %

Incision Depth: ≤ 2 m (6.6 ft)

Bankfull Width: 10-20 m (33-66 ft)

Dominant Substrate: Sand to cobble
Stream Bank Composition: Alluvium
Sideslope Length/Angle: Not significant
Plant Association: Sitka Spruce/Blueberry, Western Hemlock/Blueberry
Phases: FPMa, FPMf, FPMl, FPMw, FPMs
Similar Channel Types:
FPS: <10 m wide
FPL: > 20m widht

FPL - Wide Low Gradient Flood Plain Channel
(former - FP5)

A wide forested, low gradient, shallowly incised, flood plain channel with overflow channels and bars present.

Stream Gradient: < 2 %

Incision Depth: ≤ 3 m (10 ft)

Bankfull Width: >20 m (66 ft)

Dominant Substrate: Sand to cobble
Stream Bank Composition: Alluvium
Sideslope Length/Angle: Not significant
Plant Association: Sitka Spruce/Blueberry, Western Hemlock/Blueberry
Phases: FPLb, FPLf, FPLl, FPLw, FPLs
Similar Channel Types:
FPM: Bankfull width 10-20 m (33-66 ft)
LCM: bedrock controlled
ESL: Esturay location (71 landform), saltwater tolerant vegetation

FPB-Foreland Uplifted Beach
(formerly FP1)

Channels occur on shore areas of glacial forelands such as Yakutat or mainland glacial river systems. They may flow parallel to the coastline when occupying depressions between relic beach deposits or flow through uplifted estuaries.

Stream Gradient: < 1 %

Incision Depth: < 2.5 m (8ft)

Bankfull Width: ≤ 2 m (6.6 ft)

FPE- Estuary Flood Plain
(formerly FP2)

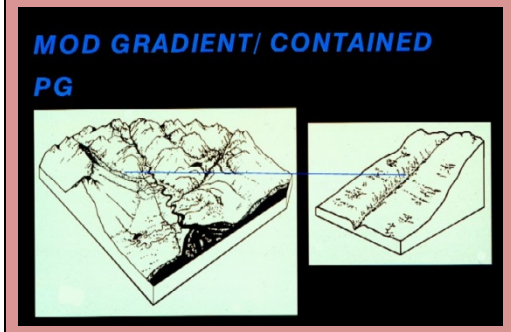
Same as FPB. Photo:An FPE channel, non-forested riparian vegetation.

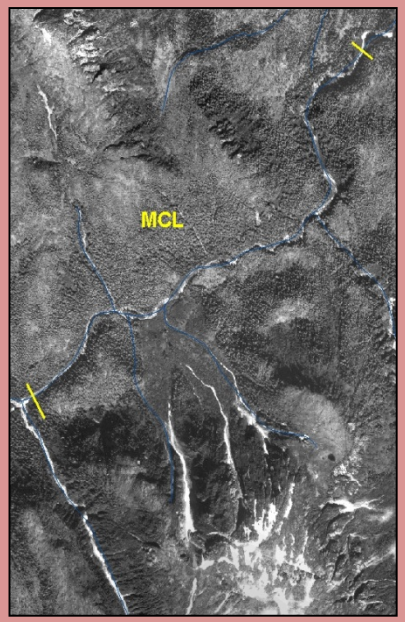
Stream Gradient: < 1 %

Incision Depth: < 2.5 m (8ft)

Bankfull Width: ≤ 2 m (6.6 ft)

Moderate Gradient Contained Process Group





Associated landforms: 40's,51,54,61,62

MCS – Small Moderate Gradient Contained Channel
(formerly- MC1)

A small contained bedrock or step-pool channel. Scrubby forest: >60% of riparian vegetation consists of nonforested canopy.

Stream Gradient: 2 to 6%
Incision Depth: <4 m (13 ft), mean = 3 m (10 ft)

Bankfull Width: <10 m (33 ft)

Dominant Substrate: Cobble to bedrock
Stream Bank Composition: Bedrock or mixed
Sideslope Length:<20m(66ft)

Sideslope Angle: <50%

PlantAssociation:
Mixedconifer/B.berry,Nonforest, Hemlock/B.berry

MCM–Medium Moderate Gradient Contained Channel
(formerly- MC2 MC3)

Moderate width bedrock or step-pool channel. Typical to barrier/gorge class III

Stream Gradient: 2 to 6%
Incision Depth: variable can be up to 20 m (13-66 ft), mean = 13 m (43 ft)
Bankfull Width: 10-20 m (66 ft)

Dominant Substrate: Cobble, boulder, bedrock
Stream Bank Composition: Bedrock to mixed
Sideslope Length: 4-20 m (13-66 ft)
Sideslope Angle: <100%

Plant Association:
W.Hemlock/B.berry, Mixed conifer/B.berry, S.Spruce/B.berry

MCL-LargeModereate Gradient Contained Channel
(formerly-LC2)

A wide,bedrock or step-pool channel.

Stream Gradient: 2 to 6%
Incision Depth: variable

Bankfull Width: > 20 m (66 ft)

Dominant Substrate: Small rubble (cobble) to bedrock
Stream Bank Composition: Bedrock

Sideslope Length: >15 m (50 ft)

Sideslope Angle: >70%

Plant Association: W.Hemlk/B.berry, S.Spruce/Alder, Nonforest S.Alder & D.Club

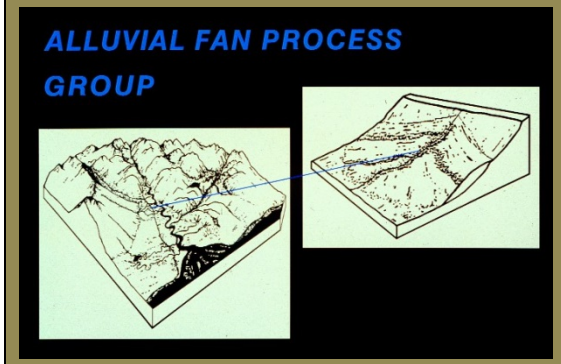
Stream Gradient: 2 to 6% (mean 3%)
Sediment Function: Transport, temporary storage
Stream Class: I, II, III

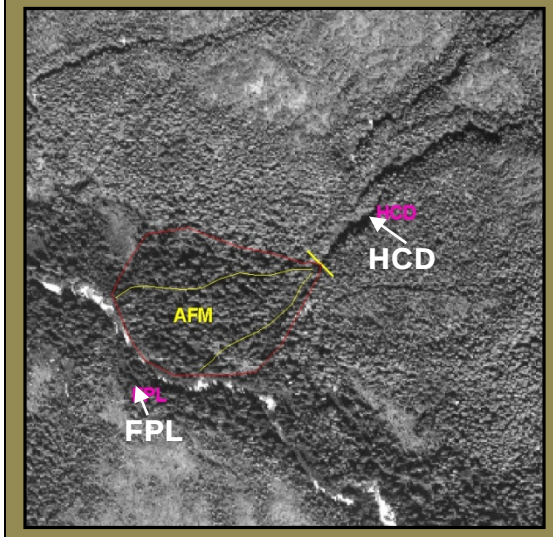
MCO- Micro Moderate Gradient Contained Channel
Incision Depth: < 4m (13 ft)
Bankfull Width: 0.3 to 1.5 m (1 to 5 ft)
No Photo

MCD- Deep Incision Moderate Gradient Contained
(formerly – MC3)

Fish Habitat: Resident and anadromous habitats with variable productivity

Alluvial Fan Process Group





Associated landforms: 51,52,53

AFM-Moderate Gradient Alluvial Fan Channel
(former-AF1)
A forested, moderately steep, shallow, alluvial fan channel. High sediment storage capcity.

Stream Gradient: 1 - 6%, <6% @ midpoint of fan
Incision Depth: <2 m (6.6 ft)
Bankfull Width: <20 m (66 ft)
AFM- has higher sediment retention due to large wood
Dominant Substrate: Fine gravel to large cobble
Stream Bank Composition: Alluvium

Side slopeLength/Angle:Not significant

Plant Association: SitkaSpruce/Blueberry, W.Hemlock/Blueberry
Similar Channel Types:
AFH: gradient >6%
MMS: narrow valley, small flood plain
FPS: gradient <2%, flood plain development
HCL: not associated w/alluvial deposition

AFH-HighGradient Alluvial Cone Channel
(former-AF2)
A high gradient, shallowly incised, alluvial fan channel.

Stream Gradient: >6% @ midpoint
Incision Depth: ≤ 4m (13 ft)
Bankfull Width: Variable

Dominant Substrate: Coarse gravel to small boulders
Stream Bank Composition: Alluvium
Side Slope Length/Angle: Not significant
Plant Association: S.Spruce/Devil's Club, W.Hemlk/Blueberry, Nonforest shrubs
Similar Channel Types:
HCL:footslope landform, sideslope development,mixed/bedrock control
AFM:finer substrate, gradient <6%

GAF Glacial Alluvial Cone Channel
(former –AF8)
A steep, glacial silt laden, overland flow channel.

StreamGradient: Variable, >6%

Incision Depth: ≤ 2 m (6.6 ft)
Bankfull Width: Variable, can exceed 15 m (50 ft) at lower end
Dominant Substrate: Coarse gravel to small boulder
Stream Bank Composition: Alluvium
Side slope Length/Angle: Not significant
Plant Association: Nonforest S.Alder, Willow, and Salmonberry

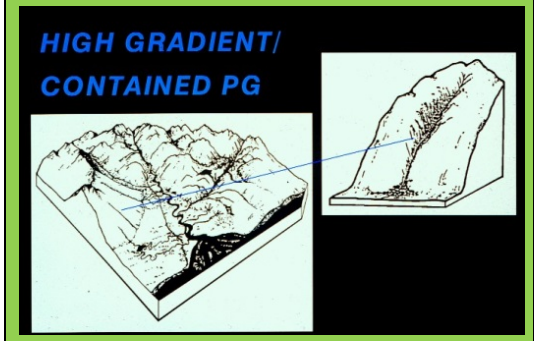
Similar Channel Types:
AFM: Non-glacial, situated on alluvial fan, gradient <6%
AFH: Non-glacial
GOC: Cirque basin landform

Stream Gradient: 1 to >6%
Sediment Function: Transport, mod storage (or transitional)
Stream Class: I,II,III, IV

AFO- Micro Alluvial Fan Channel
Bankfull Width: 0.3 to1.5 m (1 to 5 ft)

Fish Habitat: Low productivity due to dynamic channels and interrupted surface flow. **AFM**: Class I or II, some salmonid spawning at low end, limited rearing habitat

High Gradient Contained Process Group



Associated landforms: 30s, 40s, 52, 61

HCO– Micro HC Channel
A high gradient contained narrow channel possibly spring fed or associated with upslope swales, rills. Undetectable on resource aerial photography. Linked to FS0 or FP0 channels downstream.
Stream Class: IV, possibly Class II in transitional footslope segments to valley bottom
Stream Gradient: > 6 %
Incision Depth: ≤3 m (10ft)
Bankfull Width: approx. 0.3 to 1.5m (1-ft)
Dominant Substrate: Silt to coarse gravel
Stream Bank Composition: Bedrock, organic material
Sideslope Length/Angle: no data, estimated to be less than 15 ft
Riparian Vegetation: Over story = W.Hemlock, Y. Cedar, Mtn.Hemlock, Mixed Conifer, understory = Blueberry, Devil's club, Alder.

HCLw-Low Incision HC, Wetland Phase
(former -HC1)
A narrow, high gradient, low incision channel in hills and muskegs.

Stream Gradient: mean = 9%
Incision Depth: <2 m (7ft),
Bankfull Width: <10 m (33 ft)

Dominant Substrate: Small cobble, boulder, bedrock
Stream Bank Composition: Mixed or bedrock
Sideslope Length/Angle: <10 m (33 ft)/<50%
Plant Association:
Mix.Conifer/B.Berry,Mix.Conifer, W.Hemlk/B.Berry, Nonforest
Similar Channel Types:
HCV: upper valley landscape position
HCDw: deep incision.

HCL- Low Incision HC Channel
(former-HC2)
A high gradient low incision forested mountainslope or hillslope channel.

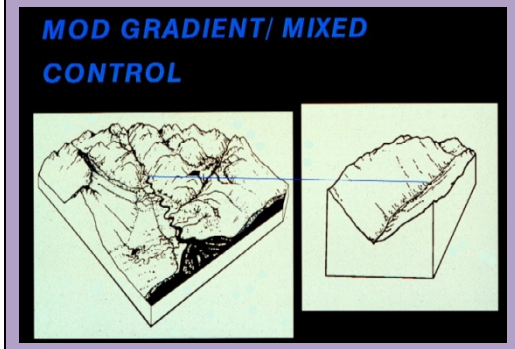
Stream gradient: mean = 10%
Incision Depth: < 2 m (6.5 ft)
Bankfull Width:<15 m (50 ft), mean = 5 m (16 ft)
Dominant Substrate: Coarse gravel to small boulder
Stream Bank Composition: Alluvium or colluvium
Sideslope Length/Angle: <15 m (50 ft)/<30%
PlantAssociation:W.Hemlock/Blueberry, S.Spruce/Blueberry or Nonforested,
Similar Channel Types:
AFH: no structural control, alluvial cone landform
HCL: muskegs adjacent, 60s landforms, poorer timber site productivity
MMS or MMM:gradient 2-6% small flood plain development

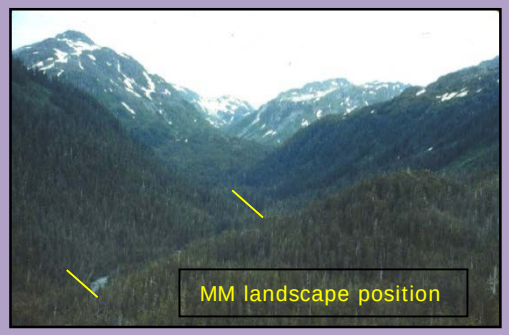
Stream gradient: > 6 %
Sediment Function: Transport
Stream Class:I, II, III,IV

Sediment source areas

Fish Habitat: Small resident population

Moderate Gradient Mixed Control Process Group





Associated landforms: 40's, 51, 54, 61, 62

MM0 – Micro Moderate Gradient Mixed Control Channel

A narrow and small, shallowly incised, moderate gradient, forested, lowland alluvial channel.

Stream Gradient: 2 to ≤ 6%

Incision Depth: less than 2m (6.5 ft)
Bankfull Width: approximately 0.3 to 1.5 m (1 to 5 ft)

Dominant Substrate: Fine gravel to small rubble
Stream Bank Composition: Mixture of alluvium and colluvium

Sideslope Length/Angle: no data

Riparian Vegetation:
W.Hemlock/Blueberry, S.Spruce/Blueberry, Mixed conifer series

MMS – Small Moderate Gradient Mixed Control Channel (formerly-MM1)

A narrow, shallowly incised, moderate gradient, forested, lowland alluvial channel.

Stream Gradient: mean = 3%

Incision Depth: ≤4 m (13 ft)

Bankfull Width: ≤ 10 m (33 ft), mean = 5 m (16 ft)

Dominant Substrate: Fine gravel to large rubble (cobble)
Stream Bank Composition: Mixture of alluvium and colluvium

Sideslope Length: < 50 m
Sideslope Angle: 14%

Plant Association:
W.Hemlock/B.berry, S.Spruce/B.berry, Mixed conifer series

MMM - Medium Width Mixed Control Channel (formerly-MM2)

A moderate gradient, moderate width, narrow flood plain, forested stream in mid to lower valley position.

Stream Gradient: mean = 3%

Incision Depth: ≤4 m (13 ft)

Bankfulll Width: 10 to 20 m (33 ft), mean = 14 m (46 ft)

Dominant Substrate: Coarse gravel to small boulders
Stream Bank Comp: Mixture of alluvium, colluvium, bedrock

Sideeslope Length: Variable
Sideslope Angle: <20%

Plant Association: Sitka Spruce/Blueberry, Western Hemlock/Blueberry/D.Club
Phases: MM2m, MM2s

Stream gradient: 2 to ≤ 6%
Sediment Function: Transitional (more transport than storage)
Stream Class: I or II

MML-Large Moderate Gradient Mixed Control Channel
Bankfull Width > 20m (66 ft)

Fish Habitat: Moderate to highly productive anadromous and resident fish habitat

High Gradient Contained Process Group

HCV Upper Valley HC Channel (former - HC3)
A steep, upper valley, forested stream.

Stream Gradient: mean = 10%,

Incision Depth: >6 m (20 ft), mean = 17 m (56 ft)
Bankfull Width: Variable, usually <20 m (66 ft), mean = 7 m (23 ft)
Dominant Substrate: Small cobble to bedrock
Stream Bank Composition: Bedrock and alluvium (cobble)
Sideslope Length/Angle: >20m (66ft)/50 to 100% valley sidelopes doninate
Plant Association: Western Hemlock/Blueberry, Nonforest Salmonberry & S.Alder
Similar Channel Types:
HCL: low incision, mountain slope position
HCD:deep incision, mountainslope position

HCDw Deep Incision HC Channel, wetland phase (former - HC4)
A steep, deeply incised channel in or adjacent to hills and lowland muskegs.
Stream Gradient: mean = 9%

Incision Depth:>6 m (20 ft), mean = 14.5 m (48 ft)
Bankfull Width: 4-15 m (13-50 ft) mean = 5.4 m (18 ft)

Dominant Substrate: Small cobble to bedrock
Stream Bank Composition: Bedrock

Sideslope Length/Angle: 6-20 m (20-66 ft)/>100%

PlantAssociation:Nonforested,Mixed Conifer/B.berry,ShorePine/Crowberry
Similar Channel Types:
HCLw: low incision <2 m (7 ft); sideslope length <6 m (20 ft)

HCM Moderate Incision HC Channel (former HC5)
Moderate incision, high gradient, mountainslope cascade channel. Bedrock control dominates.
Stream Gradient: > 6 %

Incision Depth: ≤ 2 m to 6 m (20 ft)
Bankfull Width: Variable, mean = 4 m (13 ft)

Dominant Subtrate: Large rubble to bedrock
Stream Bank Composition: Bedrock

Sideslope Length/Angle: <10 m (33 ft)/<50%

Plant Association:
W.Hemlk/B.berry, S.Spruce/B.berry/D.Club, Mixed Conifer Similar Channel Types:HCD: deep incision; sideslopes >10 m (33 ft)/100%
HCLw: deep incision, wetland assoc
HCV: valley bottomposition.

HCD Deepl Incision Mountainslope Channel (former -HC6)
A narrow, steep, very deeply incised, high gradient, forested channel.
Stream Gradient: mean = 27%
Incision Depth: >6m (20 ft), mean = 22 m (72 ft)
Bankfull Width: variable, mean = 6 m (20 ft)

Dominant Substrate: Bedrock, boulders, cobble
Stream Bank Composition: Bedrock
Sideslope Length/Angle: >10 m/>100%

Plant Association: Western Hemlock/Blueberry, Nonforested Alder & Salmon
Similar Channel Types:
HCV: upper valley position
HCDw: wetland associated
HCL: low incision