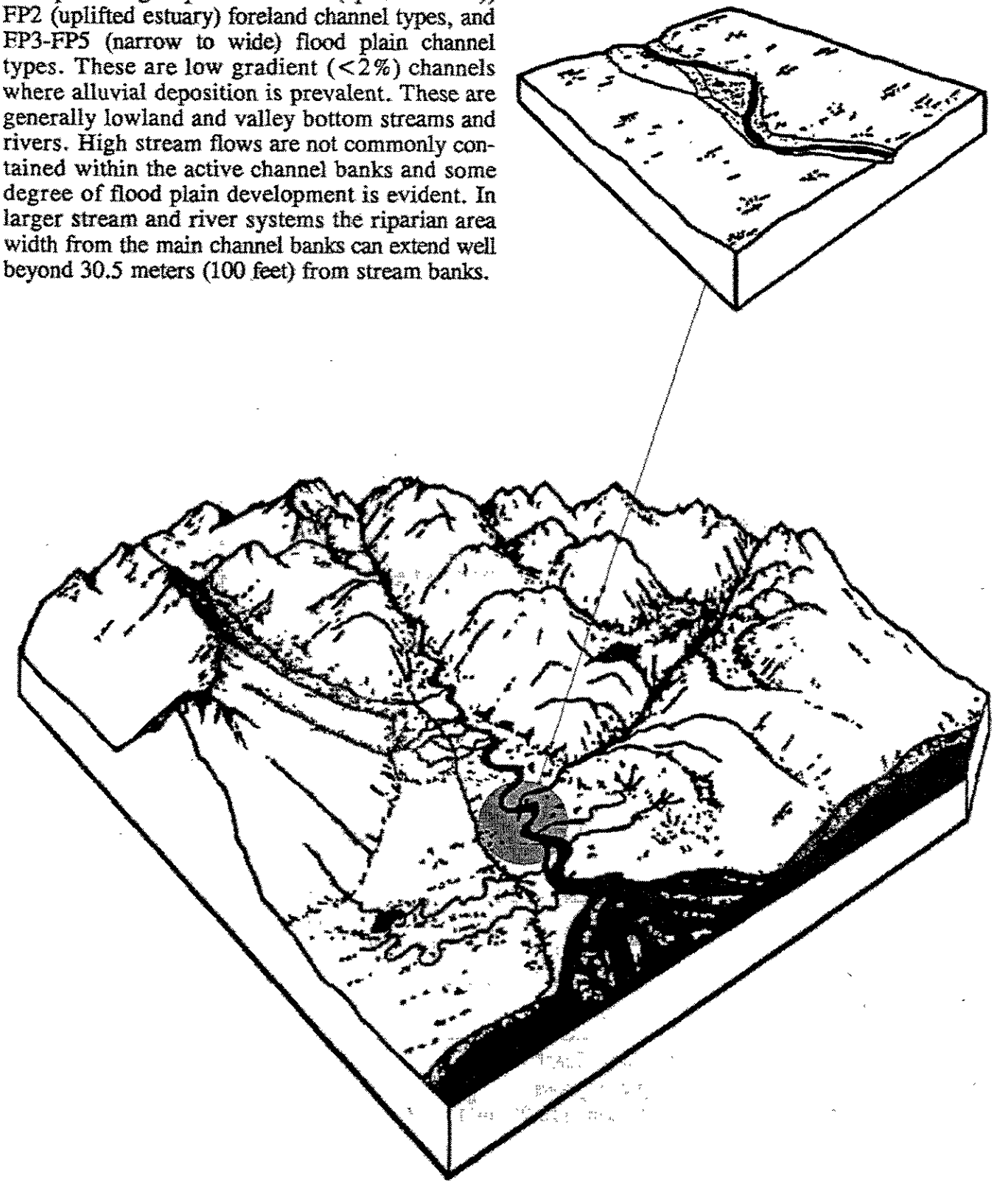
FLOOD PLAIN PROCESS GROUP

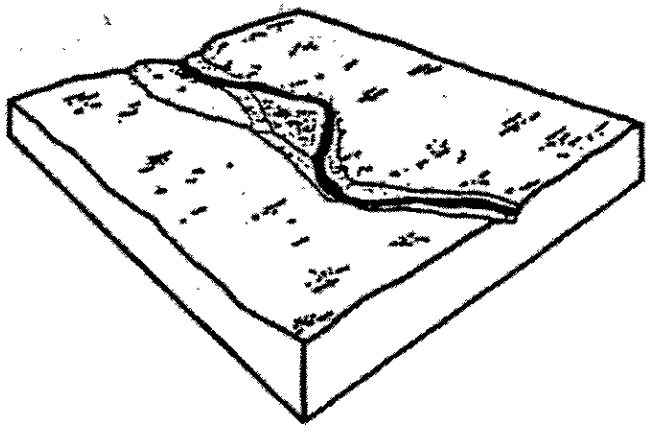
This process group includes FP1 (uplifted beach), FP2 (uplifted estuary) foreland channel types, and FP3-FP5 (narrow to wide) flood plain channel types. These are low gradient (<2%) channels where alluvial deposition is prevalent. These are generally lowland and valley bottom streams and rivers. High stream flows are not commonly contained within the active channel banks and some degree of flood plain development is evident. In larger stream and river systems the riparian area width from the main channel banks can extend well beyond 30.5 meters (100 feet) from stream banks.



UPLIFTED BEACH CHANNEL
Channel Mapping Symbol: FP1 (Formerly C4)

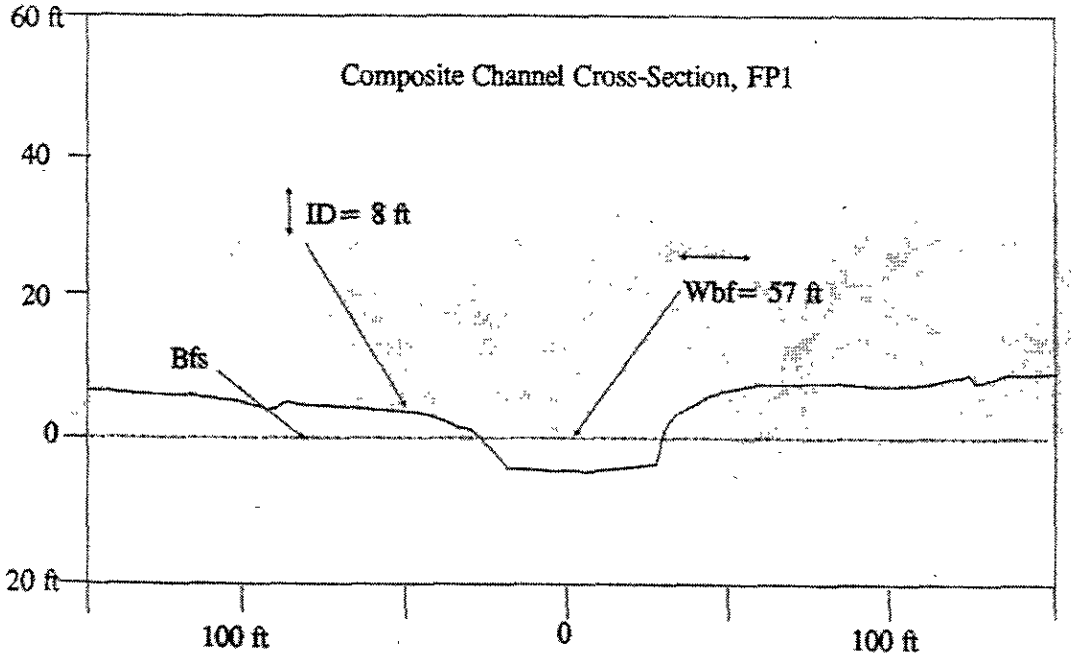
PHYSICAL CHARACTERISTICS

Geographic Setting: FP1 streams occur on near shore areas of glacial forelands. These channels tend to flow parallel to the coastline and occupy depressions between relic beach dune deposits. These streams are found in lower reaches of drainage systems, upland from current estuaries or shorelines.



Similar Channel Types: FP4.6, FP5.6

Channel Structure



Stream Gradient: .....<1%, mean = 0.5%
Incision Depth: .....< or = 3 m (10 ft), mean = 2.5 m (8 ft)
Bankfull Width:.....>12 m (40 ft), mean = 17 m (57 ft)
Dominant Substrate:.....Silt, sand and fine gravel
Stream Bank Composition: .....Fine alluvium
Sideslope Length: .....Not significant, flat landform associated
Sideslope Angle: .....Not significant
Channel Pattern:.....Single, sinuous
Drainage Basin Area:.....26-52 km^2 (10-20 mi^2)

INCHANNEL PHOTO: FP1f

INCHANNEL PHOTO: FP1s

Riparian Vegetation: The dominant riparian plant associations for the FP1 channel type are distinguished by two phases, FP1f and FP1s. The FP1f riparian vegetation is predominantly Sitka spruce/salmonberry plant association, with a significant component of nonforest plant communities. The FP1s riparian vegetation is predominantly nonforested plant communities composed of Sitka alder, willow, and meadow communities.

Plant Association Series	% Cover	
	FP1f	**FP1s**
Sitka Spruce	83%	19%
Nonforest	17%	81%

Channel Type Phases:

- ☐ FP1f - FORESTED PHASE has a dominant Sitka spruce riparian vegetation component, however, willow/alder shrub species predominate along the channel margins. This vegetation pattern limits potential large woody debris recruitment to these streams.
- ☐ FP1s - SHRUB PHASE has extensive willow/alder shrub communities in the riparian zone.

MANAGEMENT CONSIDERATIONS

Hydrologic Function: These are depositional channels that tend to retain a high proportion of fine sediments. FP1 streams are low energy due to very low stream gradient and poor flow containment. Only fine organic and silt particle fractions tend to flush through these systems during high flow events.

Aquatic Habitat Capability

Large Woody Debris ..... < 100 ft^3/1000 linear ft
Available Spawning Area (ASA) .....Insufficient data
Available Rearing Area (ARA) .....Insufficient data

Indicator Species Ratings

MIS	ASA	ARA
Coho	LOW	HIGH
Pink	NEG	NEG
Chum	NEG	NEG
Sockeye	LOW	LOW
Chinook	NEG	NEG
Dolly Varden	LOW	MOD
Steelhead	NEG	NEG

FP1 channels are always accessible to anadromous species. Substrates are generally too fine to allow significant spawning success, though some spawning habitat is available. Rearing habitat is considerable and may get moderate use by coho salmon and Dolly Varden char, especially when in association with streamside vegetation cover, and occasional use by sockeye. These channels have potential for providing overwintering habitat for coho.

Riparian Management Considerations

Concern for Management of:

Large Woody Debris .....MOD
Sediment Retention .....HIGH
Stream Bank Sensitivity.....HIGH
Sideslope Sensitivity.....N/A
Flood Plain Protection Needs .....MOD
Culvert Fish Passage .....LOW

Large wood is generally not a major habitat component in FP1 channels due to the nature of vegetation succession in the settings where these channels occur. Most vegetation adjacent to FP1 channel types are composed of meadow or shrub species in relic dune depressions, while spruce stands occupy former dune crests. Infrequently, spruce stands border FP1 stream banks. Input of large woody debris can provide important pool habitat and cover for rearing fish in these cases.

Sediment retention is a concern in these streams. Riparian management emphasis should be placed on erosion control practices (BMPs 12.17, 14.13, 14.9, 13.11-13.13).

Stream bank sensitivity is high due to the predominance of sand banks. Shrub and meadow root mats are very important for maintaining stream bank structure. Protection of stream bank integrity is an important riparian management consideration (BMPs 12.7, 13.16, 14.17).

Protection of high value wetlands commonly associated with FP1 riparian areas is a primary management concern (BMPs 12.4-12.6, 13.15).

These are classified as Value Class I streams. A minimum 100 foot timber harvest buffer is required along both banks of these streams (Tongass Timber Reform Act, 1991). Control of inchannel operations is also an important riparian management concern (BMP 14.14).

Riparian Management Opportunities:

Sport Fish Potential.....HIGH
Enhancement Opportunities .....Large Wood Placement, Spawning Channels

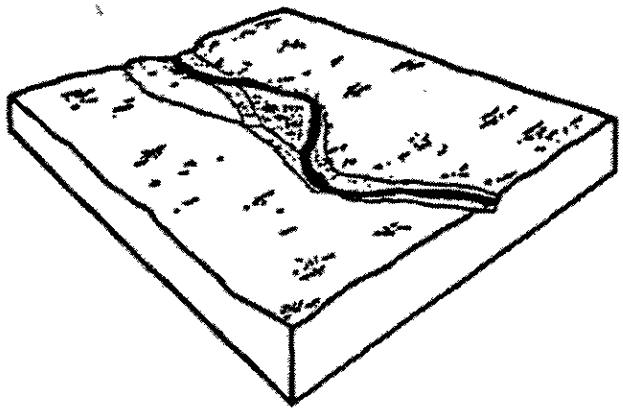
These channels offer excellent sport fish potential. Access by foot from the beach or by small boat is generally good. Deep pools at meanders and reaches influenced by tidal backwater provide the best angling opportunities.

Where suitable material exists in proximity to the channel, placement of large woody debris can be used to increase cover and rearing area for juvenile fish. FP1 channel segments have limited spawning habitat due to sandy substrate. Upland tributaries with groundwater recharge and gravel substrate may be suitable for spawning channel projects.

FORELAND UPLIFTED ESTUARINE CHANNEL
Channel Mapping Symbol: FP2 (Formerly C6 and B8)

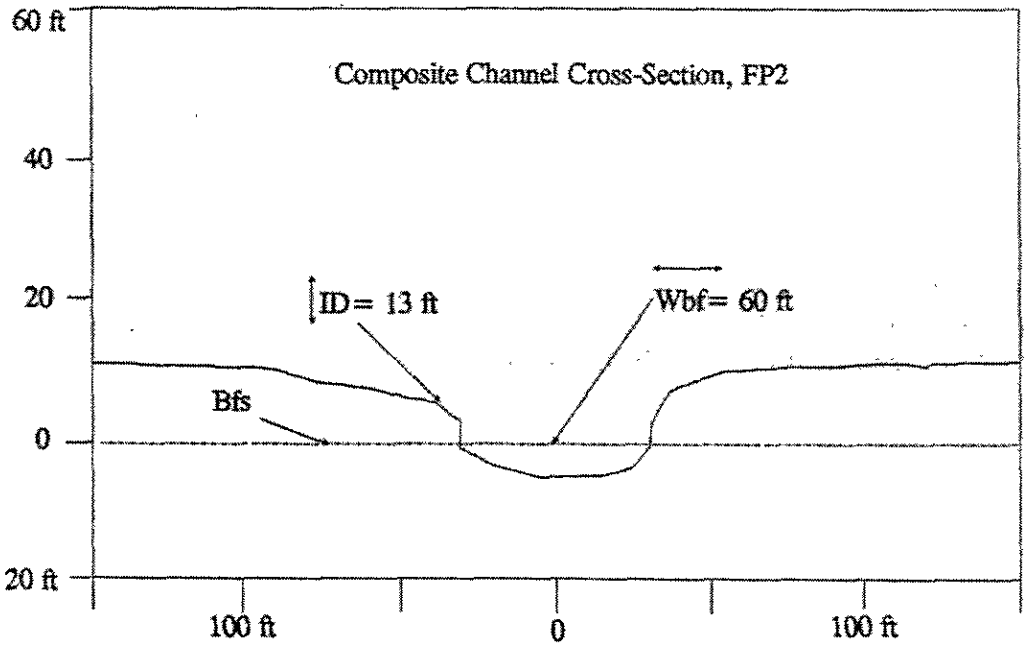
PHYSICAL CHARACTERISTICS

Geographic Setting: The FP2 stream is found on uplifted estuaries, prevalent in recently deglaciated forelands and large mainland river deltas.



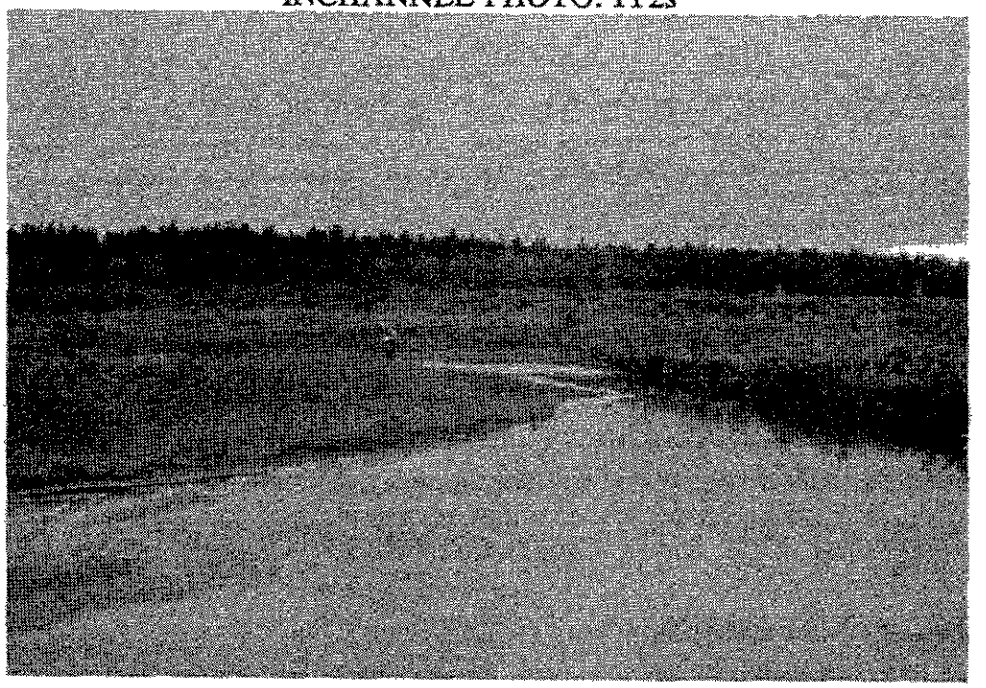
Similar Channel Types: FP1, ES4

Channel Structure



Stream Gradient: .....<1%, mean = 0.5%
Incision Depth: .....<6 m (20 ft), mean = 4 m (13 ft)
Bankfull Width:.....Variable, mean = 18 m (60 ft)
Dominant Substrate: .....Silt to fine gravel
Stream Bank Composition: .....Silt
Sideslope Length: .....<5 m (16.5 ft), mean = 3 m (10 ft)
Sideslope Angle: .....Mean = 34% (19 degrees)
Channel Pattern:.....Single, sinuous
Drainage Basin Area:.....26-52 km^2 (10-20 mi^2)

INCHANNEL PHOTO: FP2s



Riparian Vegetation: The riparian plant associations for FP2 stream are distinguished by two phases, FP2f and FP2s. Nonforest plant communities commonly found in riparian areas associated with both phases include sedge, sphagnum, and sweet gale bog communities.

Plant Association Series	% Cover	
	FP2f	FP2s
Sitka Spruce	50%	30%
Nonforest	50%	70%

Channel Type Phases:

- ☐ FP2f - FORESTED PHASE riparian vegetation has co-dominant spruce and nonforest plant communities. Inchannel large woody debris recruitment is a significant factor influencing fish rearing capability in some channel reaches.
- ☐ FP2s - NONFOREST PHASE riparian vegetation is dominantly shrub and muskeg bog plant communities.

MANAGEMENT CONSIDERATIONS

Hydrologic Function: FP2 channels have low stream energy due to very low channel gradient and a lack of flow containment. The high silt content of the FP2 stream bed and banks, and the proximity to glacial outwash channels, result in a characteristically high, suspended sediment load. Significant amounts of inchannel fine sediment storage can occur in pools and sand bars.

Aquatic Habitat Capability

Large Woody Debris ..... < 1000 ft^3/1000 linear ft
Available Spawning Area (ASA).....Insufficient data
Available Rearing Area (ARA).....Insufficient data

Indicator Species Ratings

MIS	ASA	ARA
Coho	LOW	MOD
Pink	NEG	NEG
Chum	NEG	NEG
Sockeye	LOW	LOW
Chinook	NEG	NEG
Dolly Varden	LOW	MOD
Steelhead	NEG	NEG

FP2 channels are always accessible to anadromous species. Substrates are composed predominantly of sand and silt (88%) which limits spawning capability for salmonid species. These channels provide some rearing potential, with moderate use by coho salmon and Dolly Varden char, and occasional use by sockeye salmon. FP2 channels may provide some overwintering habitat, especially when large woody debris is present, however, large woody debris recruitment is low in these streams.

Riparian Management Considerations

Concern for Management of:	
Large Woody Debris	LOW
Sediment Retention	HIGH
Stream Bank Sensitivity	HIGH
Sideslope Sensitivity	N/A
Flood Plain Protection	MOD
Culvert Fish Passage	MOD

Large wood influence on channel morphology and fish habitat is generally low for this channel type due to the geographic setting. These channels are found on uplifted coastal embayments that are dominated by muskeg vegetation types.

Sediment retention is naturally high for gravel and sand size material, however, sediment inputs generally have limited effects on habitat in FP2 channels, due to little available spawning habitat.

Stream banks are composed of relatively cohesive silt particles. This material has relatively low bearing strength and is susceptible to earth flow type failures if physically disturbed. This can create problems for bridge design and installation of road crossings (BMPs 13.16, 14.2, 14.3, 14.17).

Protection of important wetland values and functions is an important management consideration for FP2 riparian areas (BMPs 12.4-12.6, 13.15).

These are classified as Value Class I streams. A minimum 100 foot timber harvest buffer is required along both banks of these streams (Tongass Timber Reform Act, 1991).

Riparian Management Opportunities:

Sport Fish Potential..... HIGH
Enhancement Opportunities ..... Large Wood Placement, Spawning Channels

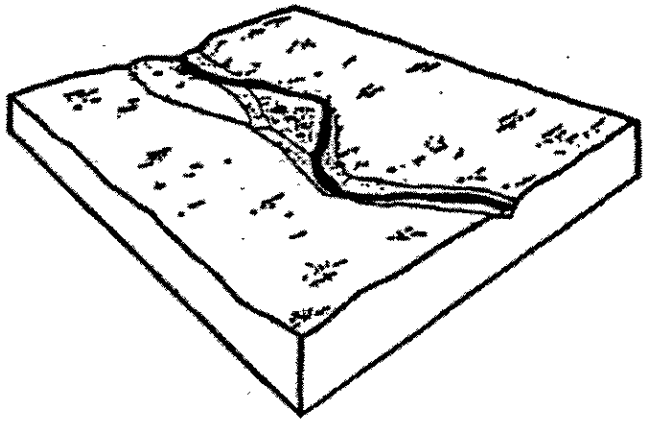
These channels are generally accessible by small boat. Primary sport species are coho salmon and Dolly Varden char. Banks with overhanging shrubs and deep meander bend pools offer the best angling opportunities.

Where local sources of large wood are available, insertion of wood habitat structures can improve cover and pool habitat in FP2 channels. FP2 channel segments are typically spawning limited. Opportunities to develop spawning channels in upland tributary channels, having gravel substrate and ample groundwater recharge, can be explored, provided that existing rearing habitat is not already at its carrying capacity.

NARROW LOW GRADIENT FLOOD PLAIN CHANNEL
Channel Mapping Symbol: FP3 (Formerly B1)

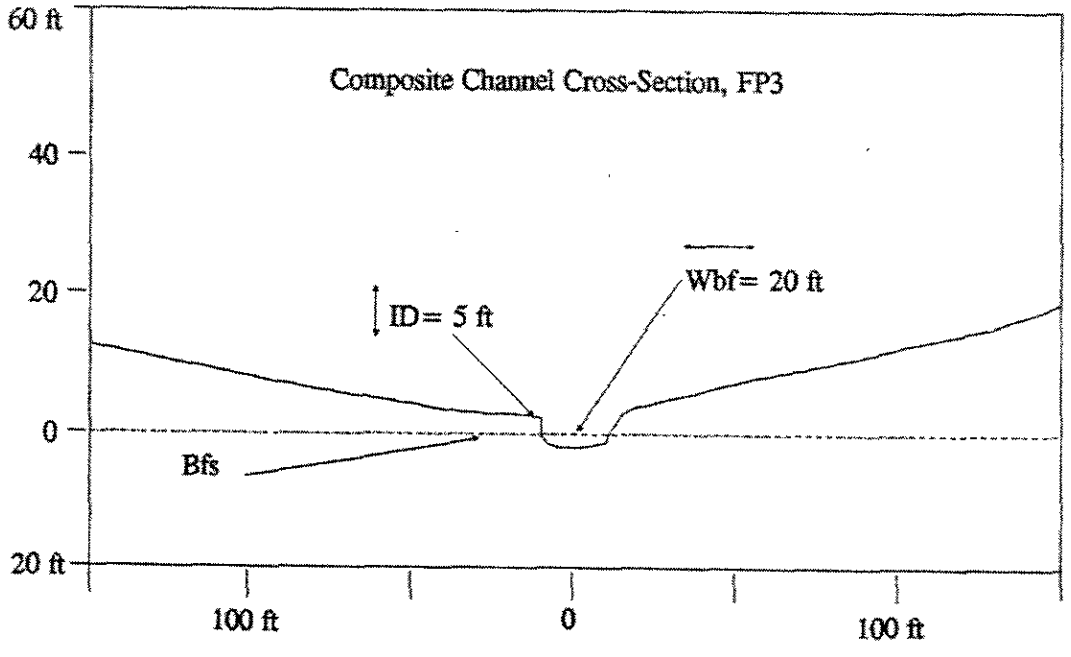
PHYSICAL CHARACTERISTICS

Geographic Setting: FP3 streams are located in the valley bottoms and may also occur within flat lowlands or low elevation drainage divides. Frequently, FP3 streams lie adjacent to the toe of footslopes or hillslopes, adjacent to main trunk, valley bottom channels. The flood plain of large, low gradient alluvial channels (FP4 or FP5) may be dissected by FP3 streams. Where FP3 streams occur parallel to footslopes or in valley bottom locations, they are typically fed by high gradient streams. In small drainage basins, HC3 or MM1 channels may directly precede a FP3 stream. Less frequently, FP3 streams are situated on mountainslope benches.



Similar Channel Types: MM1, AF1

Channel Structure



Stream Gradient: .....< or = 2%, mean = 1%
Incision Depth: .....< or = 2 m (6.5 ft), mean = 1.5 m (5 ft)
Bankfull Width:.....<10 m (33 ft), mean = 6 m (20 ft)
Dominant Substrate:.....Sand to small rubble
Stream Bank Composition:.....Sand to coarse gravel
Sideslope Length:.....Not significant, flat flood plain landform adjacent
Sideslope Angle:.....Not significant
Channel Pattern:.....Single to multiple channels, sinuous
Drainage Basin Area:.....2.59-13 km^2 (1-5 mi^2)

INCHANNEL PHOTO: FP3

Riparian Vegetation: The riparian plant associations for FP3 and FP3f are dominated by the Sitka spruce series and the western hemlock series. Salmonberry and alder shrub communities are the principal nonforest riparian plant communities, which are dominant in the FP3m and FP3s channel type phases. Willow shrub and sedge/sphagnum bog communities are the primary nonforest riparian communities in the FP3m phase. Sitka alder and willow shrub communities are the predominant riparian vegetation associated with the FP3s phase.

Plant Association Series	**% Cover**			
	FP3	**FP3m**	**FP3f**	**FP3s**
Sitka Spruce	36%	---	82%	3%
Western Hemlock	23%	---	---	---
Mixed Conifer	16%	---	---	---
Shore Pine	---	11%	---	---
W.Hemlock/Red Cedar	11%	14%	---	---
Nonforest	7%	75%	17%	90%

Channel Type Phases:

- ☐ FP3a - VOLCANIC ASH PHASE is primarily restricted to Kruzof Island. Stream bank composition is influenced by poorly consolidated volcanic ash and breccias. Stream bank and sideslope sensitivity may be higher than is typical for this channel type.
- ☐ FP3m - MUSKEG VEGETATION/GRAVEL SUBSTRATE PHASE is characterized by muskeg/scrub forest riparian vegetation. Fish spawning and rearing habitat capabilities may be lower than is typical for this channel type.
- ☐ FP3f - FORELAND OUTWASH FORESTED PHASE is influenced significantly by groundwater influx from shallow alluvial aquifers. Fish habitat capability may be higher than is typical for this channel type due to temperature moderation by groundwater.

☐ FP3s - FORELAND OUTWASH SHRUB PHASE is significantly influenced by groundwater inflow. Rearing habitat capability may be less than FP3f (FORELAND OUTWASH FORESTED PHASE) due to a lack of large woody debris input, and, as a consequence, less pool structure and cover habitat.

MANAGEMENT CONSIDERATIONS

Hydrologic Function: FP3 channels function as sediment deposition systems. Sediment routed from high and moderate gradient sediment transport channels is temporarily stored in this channel and on the adjacent flood plain. Sand and fine gravel deposits in point bars and pools are dominant streambed features. Sensitive stream banks, constantly affected by constructive and erosive forces, also contribute to the sediment load in FP3 channels. Large woody debris accumulations are frequent and retain significant volumes of fine sediment. Stream power is low, allowing for massive mobilization of sediment only during peak flow events.

Aquatic Habitat Capability

Large Woody Debris .....4000 ft^3/1000 linear ft
Available Spawning Area (ASA).....Avg = 21% for 53 sites
Available Rearing Area (ARA).....Avg = 49% for 53 sites

Indicator Species Ratings

MIS	ASA	ARA
Coho	HIGH	HIGH
Pink	MOD	NEG
Chum	MOD	NEG
Sockeye	HIGH	NEG
Chinook	LOW	LOW
Dolly Varden	HIGH	HIGH
Steelhead	MOD	HIGH

These channels are frequently accessible to anadromous species. Coarse and fine gravels compose 49% of the substrate, therefore, ASA is high (30%). These channels receive moderate to high spawning use by all anadromous species, with the exception of chinook salmon. Resident fish in lakes also use adjacent FP3 channels for spawning. When located next to accessible lakes, these channels provide excellent spawning habitat for sockeye salmon, steelhead, or sea-run cutthroat trout. FP3 channels have a large amount (51%) of ARA and are used extensively by coho, Dolly Varden, and steelhead. Thirty-seven percent of the active water in pools has an average depth of 0.31 meters (1.02 feet), which provides good overwintering habitat. Woody debris and beaver dams enhance these pools as overwintering areas.

Riparian Management Considerations

Concern for Management of:
Large Woody Debris .....HIGH
Sediment Retention .....HIGH
Stream Bank Sensitivity.....MOD
Sideslope Sensitivity .....N/A
Flood Plain Protection.....MOD
Culvert Fish Passage.....MOD

Large woody debris has a significant influence on FP3 channel structure by increasing the frequency and size of pool structures. Large woody debris helps form scour pools. The cover provided by large woody debris greatly improves rearing habitat.

Sediment retention in FP3 channel segments is high. These channel are often associated with a large flood plain complex and may be influenced by flooding of adjacent mainstem rivers. Increased sediment loading in these channels or in upstream channels could adversely impact spawning gravels. Riparian management should emphasize measures that reduce the potential for erosion and stream bank disturbance (BMPs 13.11-13.13, 13.16, 14.9-14.11).

Stream banks are composed of coarse to fine textured alluvium, which, due to low stream flow volume and relatively low stream power, are only moderately sensitive to disturbance.

Generally, flood plains for FP3 channels are narrow. However, the channels are often associated with large mainstem river flood plain complexes.

Concern for providing fish access through culvert structures in FP3 channel types is moderate. Improperly installed or poorly designed culverts can restrict juvenile and adult fish passage by creating velocity barriers or bed scour at culvert outlets (BMP 14.17). Control of inchannel operations is an important riparian management concern for these streams (BMP 14.14).

These are typically classified as Value Class I streams. A minimum 100 foot timber harvest buffer is required along both banks of these streams (Tongass Timber Reform Act, 1991).

Riparian Management Opportunities:

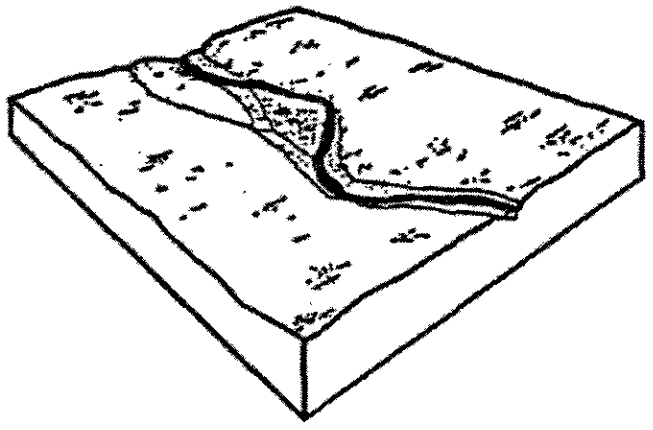
Sport Fish Potential.....LOW
Enhancement Opportunities .....Large Wood Placement, Beaver Introduction

Generally, FP3 channel types offer excellent opportunities to improve available rearing habitat through placement of large woody debris. Enhancement efforts can focus on overwintering habitats. These channels also contain habitat which is characteristically preferred by beaver. Encouragement of beaver colonization can greatly expand fish rearing potential in FP3 streams.

LOW GRADIENT FLOOD PLAIN CHANNEL
Channel Mapping Symbol: FP4 (Formerly C1)

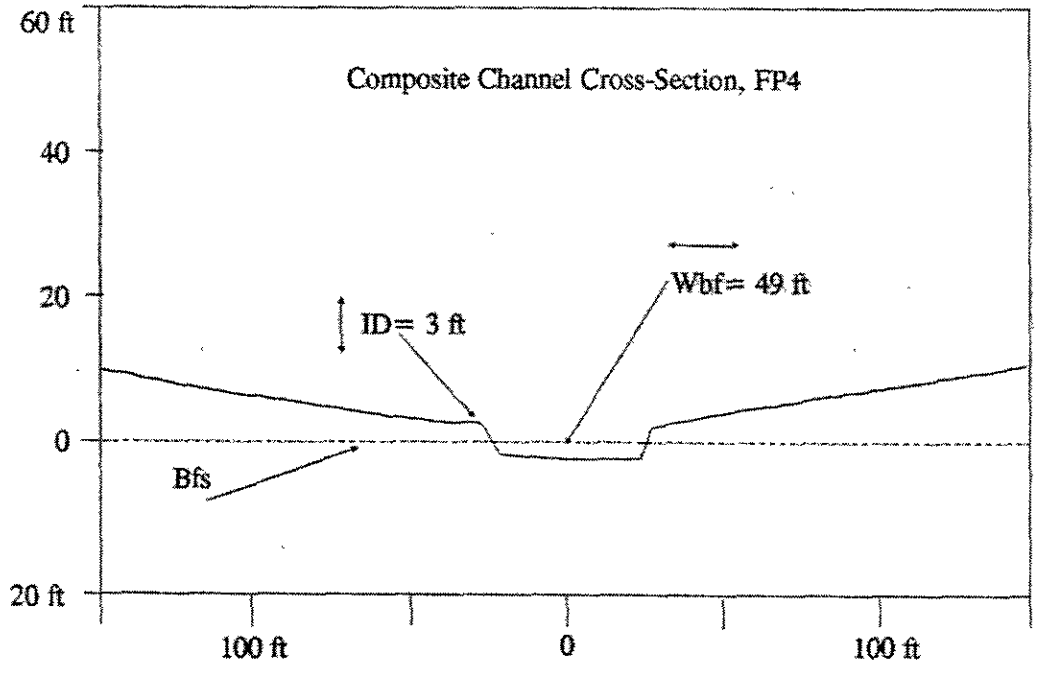
PHYSICAL CHARACTERISTICS

Geographic Setting: FP4 channels are mainstem streams in broad valley bottoms that generally have extensive flood plains. Alluvial fans, dissected footslopes, and hillslope and lowland landforms may directly abut FP4 flood plains. FP4 channels are typically sinuous, with extensive gravel bars, multiple channelways, and alluvial terraces. These channels are typically at the lower end of the stream and, therefore, have large drainage basins.



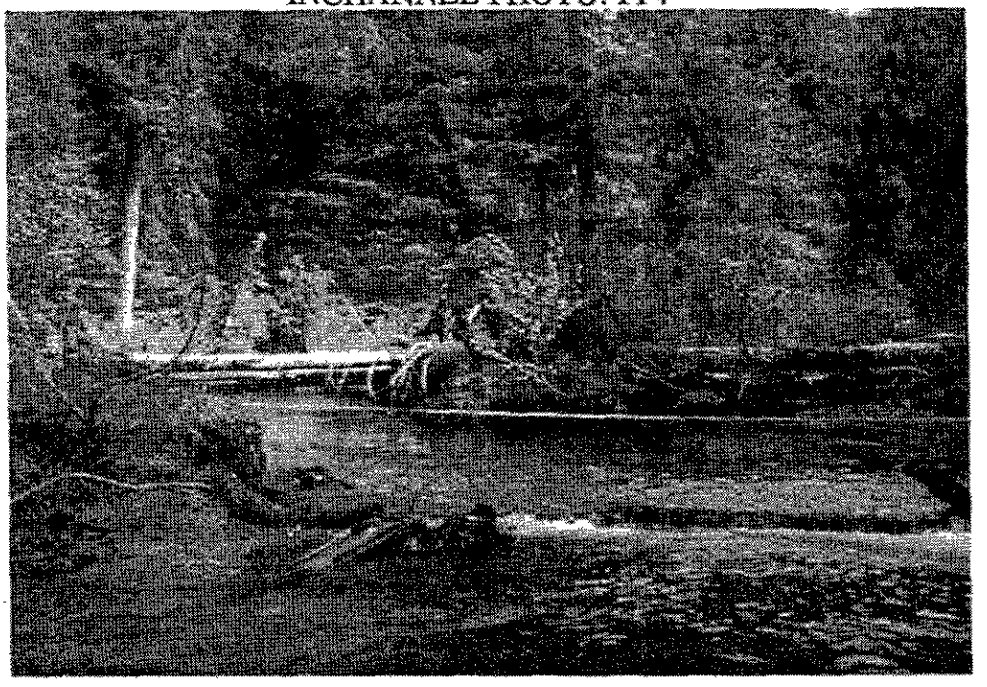
Similar Channel Types: FP3, FP5

Channel Structure



Stream Gradient: .....<2%, mean = 1%
Incision Depth: .....< or = 2 m (6.5 ft), mean = 1 m (3 ft)
Bankfull Width:.....10-20 m (33-66 ft), mean = 15 m (49 ft)
Dominant Substrate: .....Sand to cobble
Stream Bank Composition: .....Alluvium
Sideslope Length and Angle:.....Associated with a flat flood plain landform
Channel Pattern:.....Single to multiple channels, sinuous
Drainage Basin Area:.....13-39 km^2 (5-15 mi^2)

INCHANNEL PHOTO: FP4



Riparian Vegetation: The riparian plant communities for the FP4 channel type and the FP4l phase are dominated by the Sitka spruce series and the western hemlock series. Common nonforest shrub communities include salmonberry, red alder, Sitka alder, devil's club, and willow. The nonforested communities are of most significance in the FP4f and FP4s phases. The shore pine/crowberry plant association is significant in the FP4m phase. The predominant nonforest plant community in this phase is sedge/sphagnum. Sitka alder, salmonberry, and willow shrub communities are the dominant riparian plant communities for these phases.

Plant Association Series	% Cover				
	FP4	FP4l	FP4m	FP4f	FP4s
Sitka Spruce	51%	44%	14%	35%	3%
Western Hemlock	23%	27%	7%	9%	---
Nonforest	13%	18%	37%	42%	97%
Mixed Conifer	7%	4%	5%	---	---
Shore Pine	---	---	24%	---	---
Sitka Spruce-Cottonwood	---	---	---	14%	---

Channel Type Phases:

- ☐ FP4a - VOLCANIC ASH PHASE is limited geographically to drainage basins heavily affected by geologically recent volcanic deposits. Stream bank and substrate composition is predominantly scoria and ash particles deposited by multiple volcanic eruptions.
- ☐ FP4l - LARGE SUBSTRATE PHASE has greater stream power than a typical FP4 channel, thus functioning as a more efficient sediment transporter. Substrate usually is somewhat larger, and large woody debris has less influence on channel dynamics.
- ☐ FP4m - MUSKEG PHASE is typified by low gradient, muskeg or meadow channels. However, significant fine gravel, sand, and silt deposition and transport occur in this phase, making these channels more similar to the Flood Plain Process Group versus those channels categorized in the Palustrine Process Group.

- ☐ FP4f - FORELAND, OUTWASH, FORESTED PHASE includes alluvial flood plain channels that are set apart by predominant groundwater recharge. This phase is restricted to coastal foreland landforms with early successional Sitka spruce riparian stands.
- ☐ FP4s - FORELAND, OUTWASH, SHRUB PHASE includes foreland groundwater streams with shrub or muskeg riparian vegetation.

MANAGEMENT CONSIDERATIONS

Hydrologic Function: FP4 channels are characterized by temporary fine sediment storage associated with deposition in pools and point bars, and on flood plains. Bank erosion and bank building processes are continually at work resulting in very dynamic and diverse channel morphology. Channel gradient is low and flow containment is poor resulting in relatively low stream power. Sand and fine gravel constitute a large percentage of the substrate material. Large woody debris is also a major component influencing sediment entrapment and channel morphology. Stored sediments are mobilized and transported downstream during high flow events.

Aquatic Habitat Capability

Large Woody Debris .....9000 ft^3/1000 linear ft
Available Spawning Area (ASA).....Avg = 24% for 62 sites
Available Rearing Area (ARA).....Avg = 35% for 62 sites

Indicator Species Ratings

MIS	ASA	ARA
Coho	HIGH	HIGH
Pink	HIGH	NEG
Chum	HIGH	NEG
Sockeye	HIGH	NEG
Chinook	MOD	MOD
Dolly Varden	HIGH	HIGH
Steelhead	HIGH	HIGH

Rearing area is high (35%) in FP4 channels, due in part to large accumulations of woody debris. The majority of large wood pieces are in the 45.7-101.6 centimeter (18-40 inch) diameter classes and are distributed uniformly throughout the length of the stream. Winter habitat can be significant in side channel pools and where woody debris creates deep pools and low stream velocity. Woody debris and associated pool habitat is very important to both rearing juvenile and migrant adult salmonids. Undercut alluvial banks and root mats from riparian forest vegetation also provides rearing habitat. Rearing habitat diversity is enhanced by the frequent occurrence of sloughs, beaver ponds, and very small groundwater tributaries associated with FP4 channels.

Available spawning area is very high for FP4 channels because of the gravel to cobble size substrate.

Riparian Management Considerations

Concern for Management of:

Large Woody Debris .....HIGH
Sediment Retention .....HIGH
Stream Bank Sensitivity.....HIGH
Sideslope Sensitivity.....N/A
Flood Plain Protection.....HIGH
Culvert/Fish Passage .....HIGH

Large wood accumulations are important factors in shaping FP4 channel morphology. Inchannel woody debris volume is usually high and distributed throughout most forested FP4 channel segments. Flood flows are capable of redistributing debris to a limited extent in these channels. Most stable woody debris is in the 45.7-76.2 centimeter (18-30 inch) diameter class and 15.2-30.4 meters (50-100 feet) length category. Maintenance of fish habitat capability is very dependent on continuous input of large, stable woody debris over time (BMP 12.6).

These low gradient depositional channels are sensitive to sediment introduction from headwater areas, and retention of fine gravel and sand size sediment is high. Therefore, these channels are susceptible to cumulative sediment impacts on fish habitat. Stream banks are composed of fine alluvium and are susceptible to erosion. Removal or disturbance of stream bank vegetation and root mats can result in accelerated bank erosion and breakdown of undercut bank habitat. Riparian management prescriptions should emphasize erosion control (BMPs 13.11-13.13, 14.9, 14.11, 14.13), stream bank protection (BMPs 13.16 and 14.17), and control of inchannel operations (BMP 14.14).

These channels are generally associated with extensive and complex riparian areas that include such features as sloughs, side channels, beaver pond complexes, and small spring fed tributary channels. Riparian area protection (BMPs 12.4, 12.6, 13.15, 14.13) is very important for maintaining water quality and rearing habitat associated with FP4 channels.

Stream crossings for FP4 channels are normally bridges. Culvert installation on small flood plain tributary channels (often not mapped) must provide for upstream juvenile fish passage (BMP 14.17).

These are typically classified as Value Class I streams. A minimum 100 foot timber harvest buffer is required along both banks of these streams (Tongass Timber Reform Act, 1991).

Riparian Management Opportunities:

Sport Fish Potential..... HIGH
Enhancement Opportunities ..... Large Wood Placement, Fry Stocking, and Spawning Channels

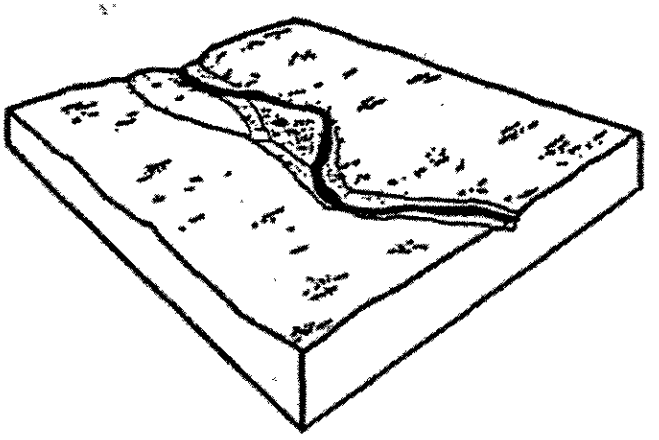
These channels offer excellent sport fish opportunities, primarily Dolly Varden, coho salmon, pink salmon, and steelhead trout. Deep pools along meander bends and associated with large log jams offer the best angling. Access by small boat to the channel itself is limited due to low water levels in the summer and numerous log jam obstructions.

A variety of enhancement opportunities exist for FP4 channels. Large woody debris projects could be evaluated where rearing habitat is limited. Fry stocking could be done when downstream fish barriers have been eliminated or laddered. Construction of flood plain spawning channels is a potential enhancement opportunity where shallow groundwater sources are present.

WIDE LOW GRADIENT FLOOD PLAIN CHANNEL
Channel Mapping Symbol: FP5 (Formerly C3)

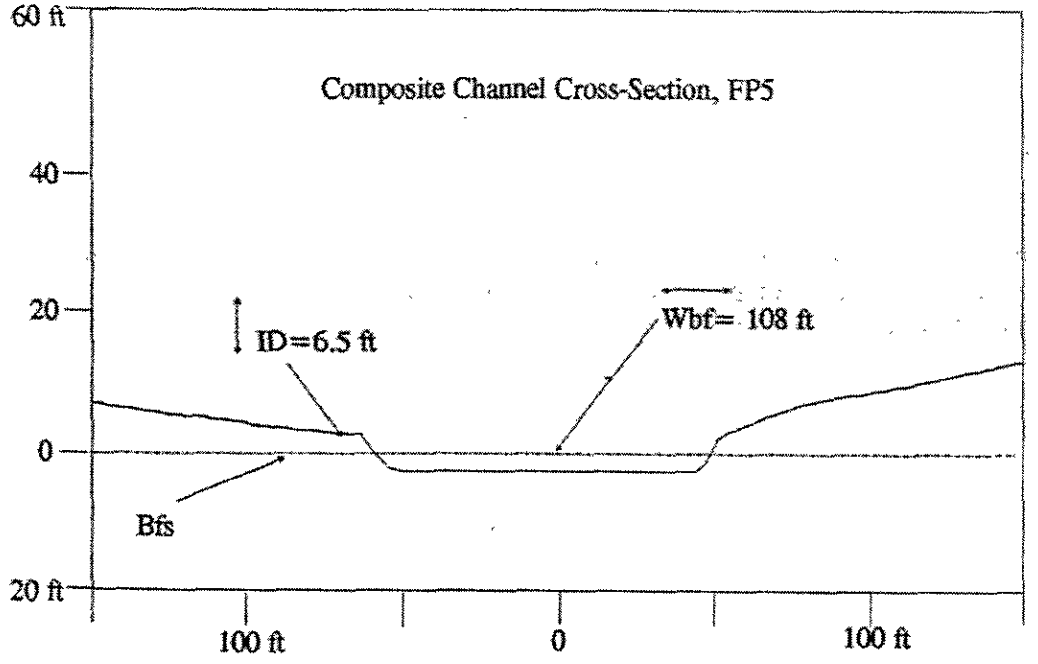
PHYSICAL CHARACTERISTICS

Geographic Setting: FP5 channels are usually found in broad valley bottoms of large to very large watersheds. Normally, these channels have extensive valley flood plains and river terraces. Smooth meander bends, numerous overflow side channels, extensive gravel bars, and large clumps of log jams are characteristic of this channel type.



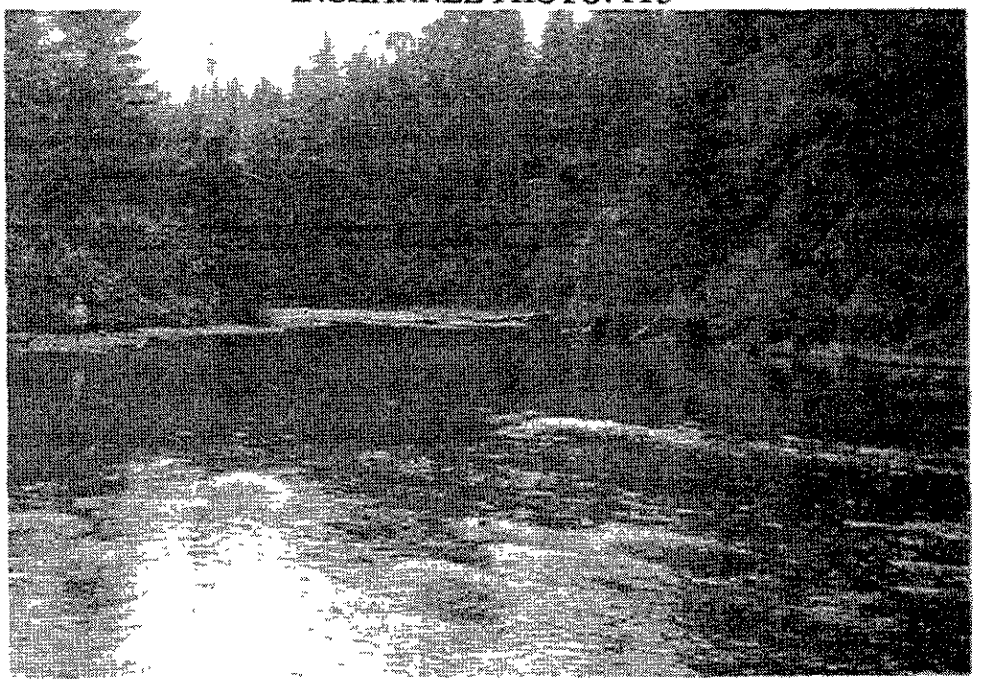
Similar Channel Types: FP4, LC1, ES4

Channel Structure



Channel Gradient:.....<2%, mean = 1%
Incision Depth: .....< or = 3 m (10 ft), mean = 2 m (6.5 ft)
Bankfull Width:.....>20 m (66 ft), mean = 38 m (108 ft)
Dominant Substrate: .....Sand to cobble
Stream Bank Composition: .....Alluvium
Sideslope Length: .....Not significant, flat, flood plain landform associated
Sideslope Angle: .....Not significant
Channel Pattern:.....Single to multiple channels, sinuous
Drainage Basin Area:.....39-78 km^2 (15-30 mi^2)

INCHANNEL PHOTO: FP5



Riparian Vegetation: The FP5 riparian communities are dominated by the Sitka spruce series, the western hemlock series, and nonforested communities. The most common nonforested communities are Sitka alder, willow, and salmonberry shrub communities.

Plant Association Series	% Cover					
	FP5	**FP5l**	**FP5b**	**FP5m**	**FP5f**	**FP5s**
Sitka Spruce	49%	38%	37%	28%	56%	15%
Nonforest	23%	54%	6%	44%	37%	79%
Western Hemlock	23%	---	41%	5%	6%	---
W.Hemlock-Red Cedar	---	3%	13%	---	---	---
Mixed Conifer	2%	3%	3%	8%	---	---
Sitka Spruce-Cottonwood	---	---	---	2%	---	4%
Shore Pine	---	---	---	13%	---	---

Channel Type Phases:

- ☐ FP5l - LARGE SUBSTRATE PHASE has greater stream power than the typical FP5 and is a more efficient sediment transport system. Substrate has a larger mean diameter than in the typical FP5 channel.
- ☐ FP5m - MUSKEG PHASE includes riparian vegetation consisting of muskeg and meadow interspersed with individual trees and some forest. This is an alluvial channel with significantly greater sediment transport than Palustrine Process Group channels that often have similar riparian plant communities.
- ☐ FP5f - FORELAND OUTWASH FORESTED PHASE are alluvial channels that are strongly influenced by groundwater recharge from shallow aquifers. This phase is restricted to coastal foreland landforms. Sitka spruce communities dominate the riparian vegetation.
- ☐ FP5s - FORELAND OUTWASH SHRUB PHASE are groundwater fed, coastal foreland channels, with predominantly nonforested riparian plant communities.

☐ FP5b - BEDROCK INFLUENCE PHASE have mixed bank control associated with occasional bedrock outcrops.

MANAGEMENT CONSIDERATIONS

Hydrologic Function: The FP5 channels function as sediment deposition systems. Low gradient, poor flow containment, and fine sized substrate are indicative of low stream power. Substrate consists mainly of sand to small cobble size particles. Short term storage of fine sediment is characteristic of FP5 channels. These fine sediment deposits are typically mobilized during high flow events. Small side channels dissecting the FP5 flood plain are a common feature.

Aquatic Habitat Capability

Large Woody Debris .....4000 ft^3/1000 linear ft
Available Spawning Area (ASA).....Avg = 27% for 56 sites
Available Rearing Area (ARA).....Avg = 29% for 56 sites

Indicator Species Ratings

MIS	ASA	ARA
Coho	HIGH	HIGH
Pink	HIGH	NEG
Chum	HIGH	NEG
Sockeye	HIGH	NEG
Chinook	HIGH	HIGH
Dolly Varden	HIGH	HIGH
Steelhead	HIGH	HIGH

FP5 channels are heavily used by spawning chinook, chum, and pink salmon, and steelhead trout because of the abundance of high quality spawning gravels. These channels get only moderate use by spawning coho salmon which prefer smaller channels. All freshwater rearing species make frequent use of these channels because rearing habitat is readily available, primarily in association with side channels, off-channel pools, and stream segments having large woody debris accumulations. Overwintering habitat in these channels is provided in off-channel slough areas and pools associated with large woody debris.

Riparian Management Considerations

Concern for Management of:
Large Woody Debris .....HIGH
Sediment Retention .....HIGH
Stream Bank Sensitivity .....HIGH
Sideslope Sensitivity .....N/A
Flood Plain Protection.....HIGH
Culvert/Fish Passage .....N/A

Maintaining future sources of woody debris is an important consideration in FP5 channels. Natural large woody debris volumes are moderately high, but, generally, inchannel wood accumulations are less stable than in smaller FP4 channels due to higher flood flows in FP5 channel types.

Retention of fine sediment (sand, gravel) is often high in FP5 channels, therefore, these channels may be sensitive to cumulative sediment inputs from headwater sources. Excessive sediment loads can degrade spawning gravel quality and, in extreme cases, can disrupt sediment transport equilibrium and channel stability. Removal or disturbance of stream bank vegetation can accelerate bank erosion and the subsequent loss of undercut bank rearing habitat. Riparian management should emphasize stream bank protection and erosion control measures to minimize potential sediment sources (BMPs 13.11-13.13, 13.16, 14.9-14.11).

Flood plain protection is a very important management consideration for FP5 channels because of off-channel features which contribute to juvenile fish rearing habitat (BMPs 12.4, 12.6, 13.8, 14.13). These off-channel flood plain features include small spring fed tributaries, sloughs, beaver pond complexes, and side channels.

The location and design of stream crossing structures is an important consideration due to the large size and natural instability of the channels and associated flood plains (BMPs 14.2, 14.3, 14.17, 14.14). Large multi-span bridges are often required to cross these channels. Roadways traversing flood plain tributaries must provide for juvenile fish migration through culverts.

These are classified as Value Class I streams. A minimum 100 foot timber harvest buffer is required along both banks of these streams (Tongass Timber Reform Act, 1991). Control of inchannel operations is an important riparian management concern for these streams (BMP 14.14).

Riparian Management Opportunities:

Sport Fish Potential.....HIGH
Enhancement Opportunities .....Large Wood Placement, Fry Stocking, Spawning Channels

The FP5 channels can offer excellent sport fish opportunities where easy beach access exists. Species of primary interest include Dolly Varden char, steelhead and cutthroat trout, and coho, pink, and chinook salmon. Small boat access into these channels can be good depending on the amount and distribution of large debris jams. Angling is best in deep meander pools and along undercut banks.

A variety of fish habitat enhancement opportunities exists in FP5 channels. Large wood may be limiting along FP5 reaches. Addition of large wood along channel margins can be successful if the structures are well anchored to the stream bank. Fry stocking programs can be implemented to take advantage of under utilized rearing habitat. Spawning channel construction is a potential enhancement option where adequate groundwater upwelling is present.

LANDSCAPE PHOTO: FP5