

WESTERN STRAIT DRAINAGES

WEST WRIA 19

- ***Snow, Bullman, Jansen & Olsen Creeks***
- ***Sekiu River***
- ***Hoko & Little Hoko Rivers***
- ***Clallam River & Estuary***
- ***Pysht River & Estuary***
Green Creek
- ***Jim & Joe Creeks***

State of the Waters ~ Snow, Bullman, Jansen & Olsen Creeks

General Description:

Streams in the Western Strait drainages flow northward from a low series of hills parallel to the Strait of Juan de Fuca, and potentially provide productive salmonid habitat. Problems with streambed and sediment are common in these salmon-producing streams. In general, fine sediment levels in streams managed for timber harvest are roughly double the level found in streams in the Olympic National Park. Scour has been documented in a few streams, and a lack of LWD is a pervasive problem. This leads to less storage of adequate spawning gravels, and more rapid transport of all types of sediment. The greater transport rate has led to channel incision and scour in some cases. Snow Creek is a small, steep tributary, which is moderately confined, and in which sedimentation is a concern with high levels of natural sediment input in addition to high sediment impacts from roads. Logging is expected to increase in the Snow Creek basin, which may increase impacts from sedimentation. The lower mainstem of Bullman Creek has a moderate amount of LWD; the entire area is heavily roaded and subjected to a high level of logging, which likely increases sedimentation there.

What do the health ratings mean to people?

These small streams along the Western Strait have little available data with which to determine impacts on humans in the watersheds, although water quality problems are recorded on most of them. To the extent that salmon habitat is limited, so are fishing oppor-

tunities. Increased incision and erosion can lead to flooding and other land use impacts that may cause problems for humans. Turbidity, low dissolved oxygen and high temperatures are problems that may impact human uses of the creeks.

What do the health ratings mean to fish?

These small creeks, with moderate to moderately-steep gradients are predominately winter steelhead streams, support limited coho salmon populations. These creeks generally support winter steelhead, chum and coho salmon, unless limited by steep gradients. Salmon need cold temperatures and lots of dissolved oxygen to thrive,

and these poor conditions will add to the stress caused by other environmental factors in these systems. Fine sediment in streams fills up the “interstitial” spaces between the gravel that fish need for spawning and feeding, and therefore negatively impacts the survival success of salmon.

Varying amounts of data exist for the small streams and rivers entering the Western Strait of Juan de Fuca. Most have been heavily impacted and have excessive sediment and water quality problems.

Current Overall Health Based on Information Below:

Snow, Bullman, Jansen & Olsen Creeks—IMPAIRED*

(*low confidence in this rating)

1. Water quality conditions according to CCWQI = AMPLE DATA DO NOT EXIST

Bullman Creek	RM	0.0 = 4 (compromised)	Over-all confidence rating: low
Snow Creek	RM	0.0 = 4 (compromised)	Over-all confidence rating: low
Olsen Creek	RM	0.0 = 4 (compromised)	Over-all confidence rating: low

The LFA reports high water temperatures for Jansen, Bullman, Olsen and Snow Creeks and high turbidity for Jansen Creek.

2. Biological conditions according to B-IBI = AMPLE DATA DO NOT EXIST

3. Habitat integrity overall for these Western Strait of Juan de Fuca Streams, according to the LFA WRIA 19 and CC Watershed Facts = IMPAIRED

Habitat concerns include:

- a. Impacts resulting from past and present watershed alterations
- b. Road densities and under-sized culverts impact streams
- c. Loss of off-channel habitat
- d. Mass wasting (landslides) and excessive sedimentation
- e. Warm temperatures, low dissolved oxygen, and high turbidity in some streams

OVER-ALL HABITAT INTEGRITY CONFIDENCE RATING: MODERATE CONFIDENCE

PARTICULAR CONCERNS

- Impacts from warm stream temperatures & turbidity in some streams
- Lack of protection from erosion and degraded habitat from lack of LWD
- Conversion of riparian habitat
- Lack of ample water quality and biological data

RECOMMENDATIONS

- Enforce and/or revise current environmental regulations to protect salmon
- Protect floodplain habitat; increase off-channel habitat
- Convert open and hardwood to conifers in riparian areas
- Increase instream LWD; stop removal of wood from channels
- Protect critical salmon habitat and address problem areas listed in box on left
- Increase water quality monitoring
- Start monitoring biological conditions

State of the Waters ~ Sekiu River

General Description:

The Sekiu River is 12.5 miles long, with an additional 36.7 miles of tributaries. A watershed analysis has been completed on the Sekiu, and fairly extensive data have been collected for stream temperatures. Most of the areas adjacent to streams in this region have been subjected to timber harvest and removal of LWD from the channels. This has increased the sediment delivery, and in some areas has caused large landslides and debris flows. The Sekiu basin had high levels of sediment fines instream, higher than unmanaged watershed values for the area. Roads and mass wasting are major contributors of the fines, with road density being very high, and was rated as “not properly functioning” in the LFA. A large network of substandard roads and aggressive basin-wide stream salvage operations (log removal) have caused most of the habitat damage. Channelization has occurred in the Sekiu basin, and the Main Line logging road that parallels the mainstem is the greatest floodplain impact in the basin. The road has resulted in channel constrictions in the lower 4.5 miles of the mainstem, causing increased channel instability and a loss of off-channel early juvenile rearing habitat, as well as winter refuge habitat for salmon. While the last large log jams were removed in the 1970’s, new log jams were added to the channel as part of 2001 restoration activities. Cedar salvage continues to diminish the majority of the remaining old-growth derived woody debris in the region. LWD is especially low in the South Fork Sekiu; the North Fork Sekiu was rated in the LFA as “good” for functional LWD, but “poor to fair” for the lack of larger key pieces. Streams in this region are highly susceptible to temperature problems because of the low elevation, and naturally low summer flows.

There are not adequate data on water quality conditions in the Sekiu River to determine impacts on humans; the habitat integrity can be determined, as the impacts are similar to those on other streams along the Western Strait of Juan de Fuca.

What do the health ratings mean to people?

There are not enough data to develop a valid health rating related to impacts on humans.

What do the health ratings mean to fish?

Summer/fall chinook, fall coho, fall chum, sockeye (strays only), winter steelhead and cutthroat have been recorded in the Sekiu River. Temperatures have been above state standards in the Sekiu River. Salmon need cold temperatures and lots of dissolved oxygen to thrive, and these poor conditions will add to the stress caused

by other environmental factors in these systems. Fine sediment in streams fills up the “interstitial” spaces between the gravel that fish need for spawning and feeding, and therefore negatively impacts the survival success of salmon.

Current Overall Health Based on Information Below:

Sekiu River—IMPAIRED*

(*low confidence in this rating)

1. Water quality conditions according to CCWQI = AMPLE DATA DO NOT EXIST

Sekiu River RM 0.0 = 4.5 (healthy) Over-all confidence rating: low

The Sekiu River is on the 303(d) list for elevated water temperatures; there are reported elevated temperatures above state standards in North and South Fork Sekiu and in the mainstem.

2. Biological conditions according to B-IBI = AMPLE DATA DO NOT EXIST

3. Habitat integrity overall for Sekiu River, according to the LFA WRIA 19, Status and CC Watershed Facts = IMPAIRED TO HIGHLY IMPAIRED

Habitat concerns include:

- a. Impacts resulting from past and present watershed alterations; impacts of wide-spread road building and maintenance
- b. Channelization, constrictions and roads impacting streams and causing landslides and excessive sediment input
- c. Loss of off-channel habitat
- d. Lack of sufficient, high-quality LWD instream

OVER-ALL HABITAT INTEGRITY CONFIDENCE RATING : HIGH CONFIDENCE

PARTICULAR CONCERNS

- Lack of ample water quality and biological data
- Habitat is highly impaired
- Main Line Road impacts on stream conditions; high road densities
- Impacts from warm stream temperatures
- Conversion of riparian habitat

RECOMMENDATIONS

- Enforce and/or revise current environmental regulations to protect salmon
- Protect floodplain habitat
- Convert open and hardwood to conifers in riparian areas
- Prevent water withdrawals that cause low flow conditions for salmonids
- Protect critical salmon habitat and address problem areas listed in box on left
- Increase water quality monitoring
- Start monitoring biological conditions

State of the Waters ~ Hoko & Little Hoko Rivers

General Description:

The Hoko River Watershed is large, with about 25 miles of mainstem and about 80 additional linear miles of tributaries. It originates in the foothills of the Olympic Mountains, and drains a steep, incised landscape that has been extensively logged and roaded. The lower 10 miles of the Hoko mainstem flow through a moderately sloped terrain, with a low gradient and plentiful gravel. Rainfall on the Hoko is abundant. The estuary extends into the river for more than a mile. The Little Hoko River is the major tributary in the lower basin, and joins the Hoko at RM 3.5. The Little Hoko flows through a moderately steep terrain. Downstream of RM 3.5, the Little Hoko has a low gradient as it flows through a flat valley to its confluence with the Hoko. Historically, the Hoko basin was a coniferous forest with a few patches of red alder. About 95% of the old growth has been converted into commercially managed tree farms, and nearly all of the basin has been harvested at least once down to the streambanks. Riparian forests are now dominated by red alder. Channels are chronically depleted of large woody debris. The Hoko drainage is greatly impacted by dense riparian roads, with hundreds of separate landslides associated with logging and clearcuts since the 1950s. About 500 acres along the lower mainstem Hoko is non-forest and in agricultural use. The Lower Hoko contains several hundred acres of non-forested state park land, which is managed for wildlife and human uses. Along the mainstem, a railroad grade extensively impacts the floodplain, contributing sediment and constricting the channel. In spite of this, the Hoko River contains abundant spawning and potentially high quality rearing habitat. The Little Hoko has been channelized and diked in the lower two miles, contributing to downcutting and scouring problems. Water withdrawals serving several communities impact summer flows in this basin with naturally low stream flows. A 1.2 million dollar restoration project was completed between 1994-98, and the results are currently being assessed. The estuary has been altered by forest practices, yet eelgrass is present and provides fish habitat at the river mouth.

What do the health ratings mean to people?

There are not enough data to develop a valid health rating related to impacts on humans, however, a public water system uses water resources from this basin.

What do the health ratings mean to fish?

The Hoko mainstem and Little Hoko both support chinook, chum, coho, and winter steelhead. Low summer flows impact upstream migration and spawning, especially for fall chinook and sometimes coho salmon. Summer temperatures have been recorded above state standards in the Little Hoko River, due to conversion impacts. Salmon need cold temperatures and lots of dissolved oxygen to thrive, and these poor conditions will add

to the stress caused by other environmental factors in these systems. Fine sediment in streams fills up the “interstitial” spaces between the gravel that fish need for spawning and feeding, and therefore negatively impacts the survival success of salmon. Over 48 miles of suitable spawning habitat exist for fall coho on the Hoko.

Current Overall Health Based on Information Below:

Hoko & Little Hoko Rivers—IMPAIRED/COMPROMISED*
 (*low confidence in this rating)

1. Water quality conditions according to CCWQI = AMPLE DATA DO NOT EXIST

Hoko River RM 0.0 = 5 (healthy)

Little Hoko RM 0.0 = 4 (compromised)

OVER-ALL CCWQI CONFIDENCE RATING (FOR WATERSHED): LOW

The Little Hoko River is on the 303(d) list for elevated water temperatures (pre-restoration).

Note: Recent data indicate lower peak temperatures since restoration activities.

2. Biological conditions according to B-IBI = AMPLE DATA DO NOT EXIST

3. Habitat integrity overall for Hoko and Little Hoko Rivers, according to the LFA WRIA 19, Status and CC Watershed Facts = IMPAIRED

Habitat concerns include:

- a. Impacts resulting from past and present watershed alterations
- b. Channelization, constrictions and road density impacting streams and causing landslides and excessive sediment input
- c. Encroachments to the floodplain, such as dikes, and loss of off-channel habitat
- d. Severe lack of sufficient, high-quality LWD instream
- e. Low flows in the summer and early fall
- f. Blockages for fish passage
- g. Estuarine habitat alteration

OVER-ALL HABITAT INTEGRITY CONFIDENCE RATING : HIGH CONFIDENCE

PARTICULAR CONCERNS

- Lack of ample water quality and biological data
- Habitat is impaired
- Impacts from railroad grade on stream conditions; high road densities
- Impacts from low flows and warm stream temperatures; impacts from water withdrawals for human water supplies
- Sediment transport and excessive water velocity from lack of LWD
- Future logging impacts
- Impacts from floodplain encroachments

RECOMMENDATIONS

- Reduce riparian road impacts and sediment inputs to lessen channel widening and pool fill
- Protect/replant conifer riparian areas
- Prevent water withdrawals that cause low flow conditions for salmonids
- Protect critical salmon habitat and address problem areas listed in box on left
- Reduce sediment inputs / sources of turbidity
- Increase water quality monitoring
- Start monitoring biological conditions

State of the Waters ~ Clallam River & Estuary

General Description:

The Clallam River is one of the least studied systems in the Western Strait of Juan de Fuca. Although there is limited information available for sediment levels, fairly detailed stream temperature data have been recorded. The Clallam River is about 13.4 miles long, with steep gradients in the headwaters and low gradients downstream. Forest practices have increased the Clallam River's fluvial sediment load over pristine levels. Most of the upper watershed is intact second growth managed by DNR under a landscape management plan. Logging impacts are primarily historic; the upper watershed is not currently delivering much sediment to the system. Road densities associated with logging have been too high for properly functioning habitat conditions to exist. Roads and railroad sites have a history of failure here, and mass wasting sites are the major contributors of the fines in the basin. The floodplain is bisected by a highway near RM 4.4-5.6, resulting in the loss of off-channel early juvenile rearing habitat. Water withdrawals in the watershed reduce stream flows in the river. The Clallam River estuary is an excellent nursery area for salmonids. However, human disturbance has degraded this habitat, resulting in delayed migration or blockage of spawning habitat to adult chinook. Several saltwater marshes have been filled, and sloughs and wetlands have been cut-off from their connections to the main channel. The mouth is occasionally blocked with a sandbar formation, which is a potential obstruction to anadromous salmonid access.

What do the health ratings mean to people?

Compromised water quality and impaired habitat indirectly impact humans, for example, as recreational uses become limited.

What do the health ratings mean to fish?

The Clallam River supports coho and chum salmon, and winter steelhead. Salmon need cold temperatures and lots of dissolved oxygen to thrive, and these poor conditions will add to the stress caused by other environmental fac-

tors in these systems. Fine sediment in streams fills up the "interstitial" spaces between the gravel that fish need for spawning and feeding, and therefore negatively impacts the survival success of salmon.

Habitat integrity impacts are similar to those on other streams along the Western Strait of Juan de Fuca.

Current Overall Health Based on Information Below:

Clallam River—COMPROMISED-IMPAIRED

1. Water quality conditions according to CCWQI = COMPROMISED

Clallam River RM	0.0 = 4.0	(compromised)
& Slough Site #1	= 3.5	(compromised)
Site #2	= 3.0	(impaired)
Site #3	= 3.5	(compromised)
Site #4	= 3.5	(compromised)
Site #5	= 4.0	(compromised)

OVER-ALL CCWQI CONFIDENCE RATING (FOR WATERSHED): HIGH CONFIDENCE

Two separate reaches on the Clallam River are on the 303(d) list for excessive temperatures; pH has been reported outside the normal range.

2. Biological conditions according to B-IBI = AMPLE DATA DO NOT EXIST

3. Habitat integrity overall for Clallam River, according to the LFA WRIA 19 = IMPAIRED

Habitat concerns include:

- Impacts resulting from past and present watershed alterations
- Channelization, constrictions and roads impacting streams and causing landslides and excessive sediment input
- Encroachments to the floodplain, such as dikes, and loss of off-channel habitat
- Low flows in the summer and early fall
- Blockages for fish passage
- Possible impacts of estuarine habitat alteration

OVER-ALL HABITAT INTEGRITY CONFIDENCE RATING: LOW CONFIDENCE

PARTICULAR CONCERNS

- Compromised water quality
- Impaired habitat
- Lack of data on biological conditions
- High stream temperatures
- Sediment transport and excessive water velocity from lack of LWD
- Impacts from floodplain encroachments

RECOMMENDATIONS

- Assess and correct impacts of blockages at the mouth
- Reduce riparian road impacts and sediment inputs to lessen channel widening and pool fill
- Protect/replant conifers in riparian areas
- Increase instream LWD where needed; stop removal of wood from channels
- Prevent increase in water withdrawals causing low flow conditions for salmonids
- Protect critical salmon habitat and address problem areas listed in box on left
- Continue water quality monitoring
- Start monitoring biological conditions

State of the Waters ~ Pysht River & Estuary,

General Description:

The Pysht River is approximately 16.3 miles long, with eight tributaries adding another 35.6 miles of stream length. In the headwaters, the gradient is steep and the U.S. Forest Service owns the surrounding land. Downstream, the river has a low gradient in the lower 11 miles. A large portion of surrounding land is managed by two industrial forest owners. Logging has impacted the water quality and quantity conditions in the Pysht. In the Pysht, there have been large shifts in channel bed elevation (mostly incision), with very low rates of lateral channel migration occurring, as well as significant channel aggradation at most sites studied. Green Creek also has highly unstable channel banks, with frequent lateral movement of the channel and significant aggradation. The cause of the channel instability problems is likely a combination of low levels of LWD throughout the watershed and high levels of sediment, which resulted in the loss of large pool habitat and thermal changes in the lower river. Sediment sources are primarily roads and mass wasting, many of which came from early logging techniques. Jim and Joe Creeks enter the Strait of Juan de Fuca east of the Pysht River. Jim Creek has a high sediment load for several reasons: logging in the upper reaches, road densities, road building spoils, and lack of LWD. In Joe Creek, naturally high sediment loads are coupled with a heavily roaded watershed, resulting in sediment problems in the creek. Lack of LWD is another streambed problem in Joe Creek. Hwy. 112 affects several streams in this group by preventing channel migration, losses of riparian forest, by rip-rap impacts, and with impassable culverts. Temperature in the lower Pysht is a big issue. The Pysht Estuary is a large and important salmon rearing habitat. Although it is thought that the estuary is recovering from the heavy impacts of the past, there are still some concerns about the continued loss of eelgrass and other estuary habitat, and active restoration efforts may be necessary. All Strait of Juan de Fuca chum stocks have declined and are “stocks of concern” (numbers have crashed in the last 6-7 years).

What do the health ratings mean to people?

Compromised water quality and impaired habitat indirectly impact humans, for example, as recreational uses become limited.

What do the health ratings mean to fish?

The Pysht River supports coho and chum salmon, and winter steelhead. Chinook may no longer be viable in the system. Channel instability in the Pysht, its tributaries and in Jim and Joe Creeks impacts the incubation survival rate of salmon in the basin. Fine sediment in streams fills up the “interstitial” spaces between the gravel that fish need for spawning, incuba-

tion and feeding, and therefore negatively impacts the survival success of salmon. Salmon need cold temperatures and lots of dissolved oxygen to thrive; these poor conditions will add to the stress caused by other environmental factors in these systems.

***Current Overall Health Based on Information Below:
Pysht River, & Green, Jim & Joe Creeks—
IMPAIRED/COMPROMISED***

1. Water quality conditions according to CCWQI = COMPROMISED

Pysht River	RM	0.0	= 4.0 (compromised)	Over-all confidence rating: moderate
@ Hwy 112			= 4.0 (compromised)	Over-all confidence rating: low
Green Creek	RM	0.45	= 4.5 (healthy)	Over-all confidence rating: low
Joe Creek	RM	0.0	= 4.5 (healthy)	Over-all confidence rating: low
Jim Creek	RM	0.0	= 4.5 (healthy)	Over-all confidence rating: low

OVER-ALL CCWQI CONFIDENCE RATING (FOR WATERSHED): LOW CONFIDENCE

In the lower miles of the Pysht, temperatures are elevated.

Not currently on the 303(d) list.

2. Biological conditions according to B-IBI = AMPLE DATA DO NOT EXIST

3. Habitat integrity overall for Pysht, its tributaries and Jim & Joe Creeks, according to the LFA WRIA 19, Status and CC Watershed Facts = IMPAIRED

Habitat concerns include:

- a. Impacts resulting from past and present watershed alterations; lack of large conifers in riparian areas for Pysht River
- b. Channelization, constrictions and road density impacting streams and causing landslides and excessive sediment input
- c. Encroachments to the floodplain and loss of off-channel habitat
- d. Blockages for fish passage
- e. Possible impacts of estuarine habitat alteration

OVER-ALL HABITAT INTEGRITY CONFIDENCE RATING: HIGH CONFIDENCE

PARTICULAR CONCERNS

- Compromised water quality
- Impaired habitat
- Lack of data on biological conditions
- Possible high stream temperatures
- Sediment transport and excessive water velocity from lack of LWD
- Impacts from floodplain encroachments and conversion

RECOMMENDATIONS

- Protect/replant conifers in riparian areas
- Increase instream LWD where needed; stop removal of wood from channels
- Prevent water withdrawals causing low flow conditions for salmonids
- Protect critical salmon habitat and address problem areas listed in box on left
- Increase water quality monitoring
- Start monitoring biological conditions