

Quileute Tribe



Nonpoint Source Assessment Report

FY 2009

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1.0 Overview:

The Tribe is developing this Nonpoint Source Pollution Assessment (NPSPA) as the first step towards funding to control sedimentation/turbidity in the Quillayute River within the Quileute reservation, under Treatment as a State for Water Quality and Clean Water Act Section 319. This NPSPA is similar to but updates the one done for CWA 106. The Tribe was granted TAS for CWA 106 several years back. Initially it performed water analyses of coastal waters, relating to Harmful Algal Bloom (HAB) analysis of bivalves (presence or absence of certain organic toxins, for which a QAPP was approved by EPA). However, for the past 2 years the Tribe has been conducting inorganic monitoring of fresh water under CWA 106 at Tier One (pH, DO, turbidity, and temperature) on-reservation. The QAPP and strategy were approved by EPA. The Army Corps of Engineers also did inorganic water quality analysis on the Quillayute River within the reservation in 2000-2001 for a supplemental EIS related to its dredging. In addition, the Tribe has been lead entity or key player in a number of cooperative efforts to protect /restore water quality, habitat and fish stocks in treaty waters that flow directly into the reservation waters (Quillayute River) and has been an Initiating Government in the recently finalized WRIA 20 Watershed Plan (RCW 90.82, WA state) . This NPS Assessment relies heavily on the CWA 106 work, but also updates with more recent work, especially water quality work done for the WRIA 20 Watershed Plan. Finally, the Tribe has been a lead government in the state process for salmon habitat restoration (fishable rivers) in WRIA 20, under the state Lead Entity process (RCW 77.85). We have won four grants under this program.

There are two major impacts of the nonpoint pollution, from the Tribe's perspective. One is on the salmonid population in the areas where spawning and rearing take place, upstream of the Reservation and downstream in the Quillayute estuary (in the reservation). Another impact is the serious shallowing of the river at its mouth, from sandbar accumulation. The river has gone from 40 feet to 15 feet or less (7 or 8 ft. in some cases) in depth¹, some of which is attributable to upstream timber harvest (although a portion is also due to mass wasting of steep slopes). Although the Rivers and Harbors Act requires the Army Corps of Engineers to keep the river mouth open, and although the US Coast Guard has a base in La Push, Congress has greatly reduced funding for dredging. The Coast Guard and Corps have had to plea for left-over moneys to dredge, while deep ports with stronger economic functions have received the reduced dredging funds. We simply don't know if the new administration will re-establish funding for La Push and other small harbors. The nonpoint source pollution is a major part of the need for dredging and threatens to render this river unfishable, though it is the point of egress and ingress for 10 salmonid runs and to date, still operates, thanks to emergency dredge funds scraped up last year.

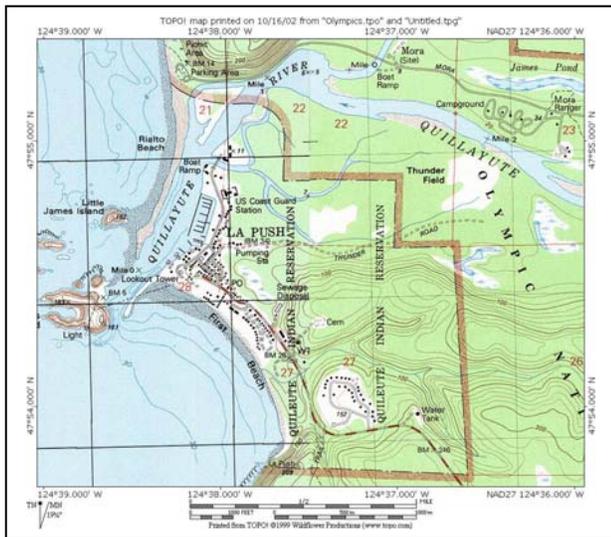
This report will discuss waterbodies on which the Tribe depends, and the nonpoint source

¹This change is from personal recollection of Chris Morganroth III, now an elder and council member, and a former diver. The current depth is well established by Army Corps of Engineers soundings and the repeated need for dredging to keep the harbor mouth open is a matter of public record. The US Coast Guard is also "trapped" with the tribe when this is not done and cannot get out at some very low tides!

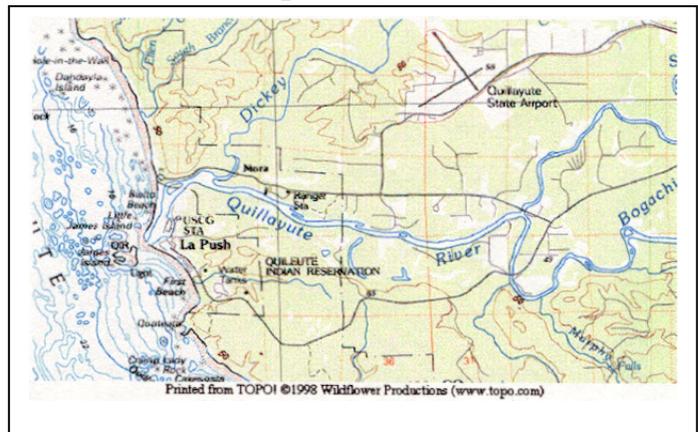
pollution issues affecting these waterbodies. It will also, for each item of discussion, summarize tribal activities to resolve such pollution, to date, and in some cases, what plans the Tribe has for the future. Studies have taken place both on the Reservation and off-Reservation. To understand why the Quileute must look at off-Reservation matters, a brief discussion of jurisdiction follows.

This Tribe has only one square mile of Reservation (approximate). The historical reasons for this are well summarized by the U.S. Supreme Court in selections from *Halbert et al. vs. United States et al.* The Quileute Reservation lies at the mouth of the Quillayute River, on the Pacific Ocean, 15 miles west of Forks in Clallam County, Washington. There are no sources of nonpoint source pollution (sediments, effluents) on the reservation. The only buildings are homes, government buildings, and a small resort. We have a sewer system.² The primary source of sediment is coming from the rivers that flow into the 5.5-RM-long Quillayute mainstem (see topographic map to right, below), largely from anthropogenic activities like timber operations.

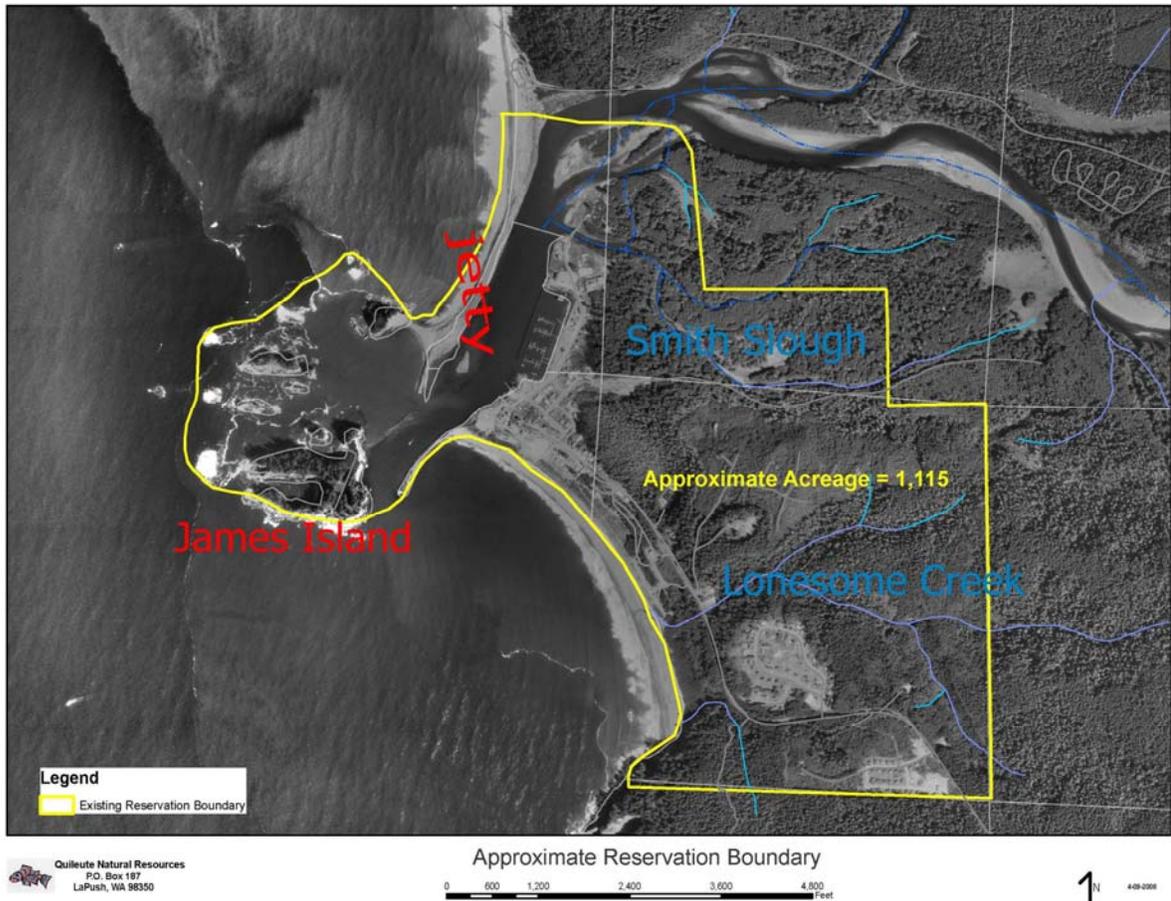
The Tribe owns the rights to the river bottom on the Reservation, pursuant to the federal case, *Moore v. US*, 157 F.2d 760 (9th Cir. 1946), winning a challenge by the state. The River is directly impacted by upstream activities; Reservation impact is negligible. Some 850 square miles of upstream watersheds discharge into the Quillayute. The rivers and fishery are co-managed by the Tribe with the State of Washington and the U.S., pursuant to treaty terms reviewed by the U.S. District Court, W.D. Wash., in *United States vs. Washington* in 384 F2d 312 (1974). The off-reservation jurisdiction is shared. MOUs and state processes such as watershed analysis (no longer used), Lead Entities (RCW 77.85) and Watershed Planning (RCW 90.82), as well as the DNR Forests and Fish rules, are vehicles for cooperative action. The Tribe only has sole jurisdiction of the Reservation and isolated trust lands nearby.



Reservation topos, L (detailed) and R.



² Wastewater Facilities were engineered by KCM of Seattle in the 1990s, supported by funds from Indian Health Service and the state Department of Ecology. A diagram of the facilities is supplied as an attachment. Even before this upgrade, however, the tribe used a sewer system and settling tanks for sludge.



Most maps do not show James Island as part of the reservation, but since at low tide it is connected as land, it is officially a part (map prepared by Quileute GPS staff when working on Olympic National Park issues.) Smith Slough is the little E-W tributary into the River, at the North end, and Lonesome Creek flows E-W at the south end, into the Pacific.

It is hoped that by developing means of assessing water quality, including sediment load, the Tribe can in the future develop appropriate standards. Upstream timber landowners may not be amenable to this. During the WRIA 20 Watershed Planning process it became apparent that they will not allow monitoring on their private lands. Therefore, monitoring was excluded from the Plan, even though water quality and fish habitat were two modules of it. The Plan cannot have anything in it that changes forest practices, but having monitoring would not, in and of itself. This was a defensive posture by timber, which the City of Forks upheld (in the name of jobs). In this tribe's favor is the fact that bifurcated Olympic National Park lies above and below the non-federal forest lands and would probably cooperate with water quality monitoring. One can interpolate for lands between.

The tribe depends on healthy salmon for both economic and cultural reasons. The Quillayute River system is one of the last in the Pacific Northwest that has no listed fish. The Tribe wants to keep it that way. The biggest concern upstream is the impact from federal, state, and private timber harvest. Both removal of vegetation cover and sedimentation that shallows streams can lead to increased stream temperature and reduced dissolved oxygen. Warmer waters can also be the cause of certain fish diseases. The sediment, besides causing channels to become shallower, can fill interstices in gravel and interfere with salmon egg respiration. Silt can also impair gill function. Stream restoration is high on the tribal list of habitat programs, as is monitoring of the effectiveness of such restoration.

On the Reservation, sound management of municipal wastes occurs through our Utilities Department, which in the 1990s established wastewater treatment with funding from federal and state programs. Sewage design conformed with the Department of Ecology. Drinking water comes from a site 4.6 miles away (aquifer), again through federal and state funding, because the local groundwater is too high in manganese and may from time to time have salt water intrusion. Lonesome Creek, water source for our hatchery. Lonesome Creek and Smith Slough (shown in maps above) are monitored for water quality (CWA 106), as is the Quillayute itself.

2.0 Introduction

2.1 Background

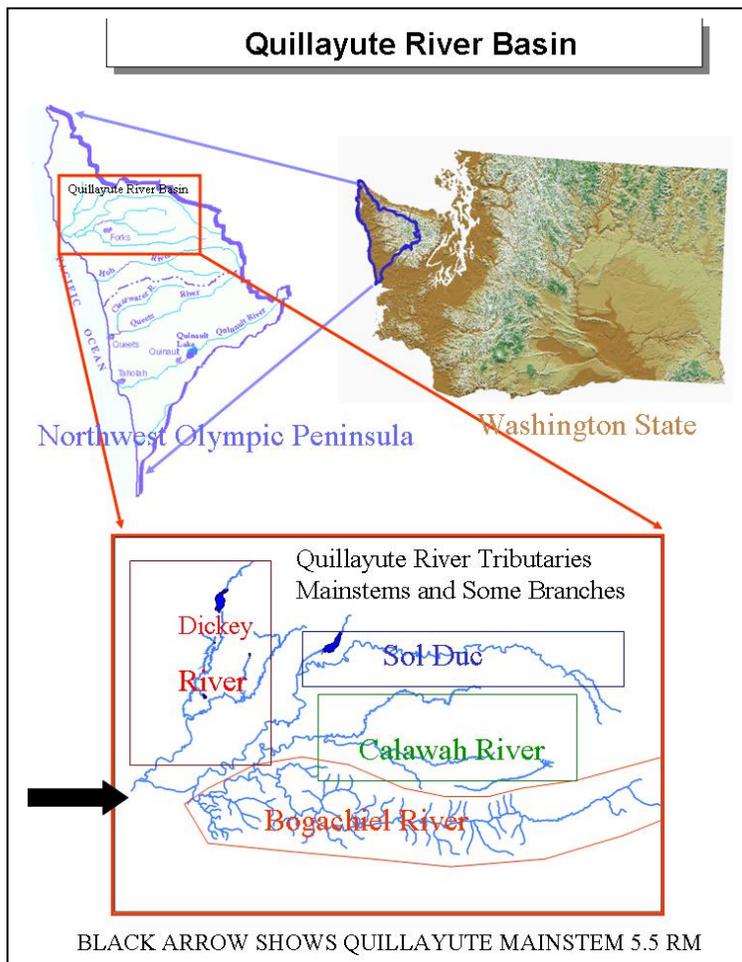
Treaty: The Quileute Tribe's ancestors were signatories of the Treaty of Quinault River of 1855, reauthorized as the Treaty of Olympia in January of 1856. The Quileute were originally assigned to live on what is today the Quinault Reservation, but in 1889 were provided with their own reservation, the basically one square mile that people see around La Push, today. The Tribe has allotments on the Quinault Reservation but they are not included in this program. Nor are the scattered small trust lands, basically surrounded by non-tribal treaty-rights lands.

Water Quality Testing to date: In 2000-1, the Army Corps of Engineers monitored the Quillayute River for inorganic criteria as part of an updated EIS for dredging. The Quileute Tribe received GAP funding to continue this as CWA 106 training, in 2002-3. The Tribe has a Water Quality Strategy and Work Plan under CWA 106 at present. It monitors the Quillayute River, Lonesome Creek, and Smith Slough for DO, T, pH, and turbidity; and hopes to broaden the scope of its activities through CWA 319. The larger goal is to develop the Tribe's administrative and technical capacity to establish an integrated environmental management program for Tribal lands and waters, and to fulfill the requirements of the Clean Water Act. At present no listed fish (ESA) are in the Quillayute system, although some char may exist above the Sol Duc falls. (USFWS does not include the Quillayute Basin in habitat for bull trout or listed char, however.) The Tribe gets all its drinking water off-reservation from aquifers about 6 miles away, because the local ground and surface water is brackish and the ground water has manganese. Long-term goals are reviewed every two years, by the environmental coordinator at Quileute Natural Resources, when writing grants, and are based on progress made on previous goals and newly emergent problems.

Partners: Out of necessity, the Tribe has for decades vigorously pursued partnerships with other

entities that have jurisdiction over lands impacting the quality of waters for which the Tribe has treaty-protected rights. These partnerships include local governments (City of Forks and counties of Clallam and Jefferson), the State of Washington (DNR, WDFW—fisheries co-manager, and Ecology), the US Forest Service, the US Fish and Wildlife Service, the National Marine Fisheries Service (fisheries c-manager), the Army Corps of Engineers (dredging the Quillayute), and the US Coast Guard (spill issues, and helping advocate dredging) To the extent that NPSP flows into the area of the Olympic Coast National Marine Sanctuary (OCNMS), it is also a partner. The tribe works with OCNMS through its Advisory Council and through the Intergovernmental Policy Council. USEPA is also a major contributor to tribal grant programs, as is the Bureau of Indian Affairs.

The tribe is an initiating government under WRIA 20 Watershed Planning (and now Implementation) body (under ESHB 2514, aka RCW 90.82) and the North Pacific Coast Lead Entity (under ESHB 2496, aka RCW 77.85). Through these mechanisms, which both include local private citizen landowners as well as non-profit organizations and governmental entities, a broad base of public involvement is achieved. Funding sources are pooled and leveraged. Decisions are made in a coordinated and collaborative manner. TMDL work for nonpoint source pollution has not begun. The Department of Ecology is challenging whether it is subject to Forests and Fish Report agreements in 1999 and subsequent regulations that might require timber to engage in NPSP TMDLs and timber is reluctant to have monitoring occur on its property.



Purple line shows the entire treaty area of Treaty of Olympia.

Area of WRIA and LEG work.

Enlargement shows Major rivers of the Quillayute Basin. Sol Duc is about 100 RM long (scale)

Culture, Geography, Geology, and Biology. The Quileute Tribe has been in this area since “time immemorial” (certainly thousands of years, including the last Ice Age advance, based on oral history, artifacts, and on Ice Age displays at the Victoria, B.C. Museum of Natural History). The people subsisted on fishing (salmonids), whaling, seal hunts, shellfish gathering, berry gathering, and hunting of elk, deer, and small mammals and birds. Fishing, including the gathering of shellfish, is still key to the tribal economy and culture.

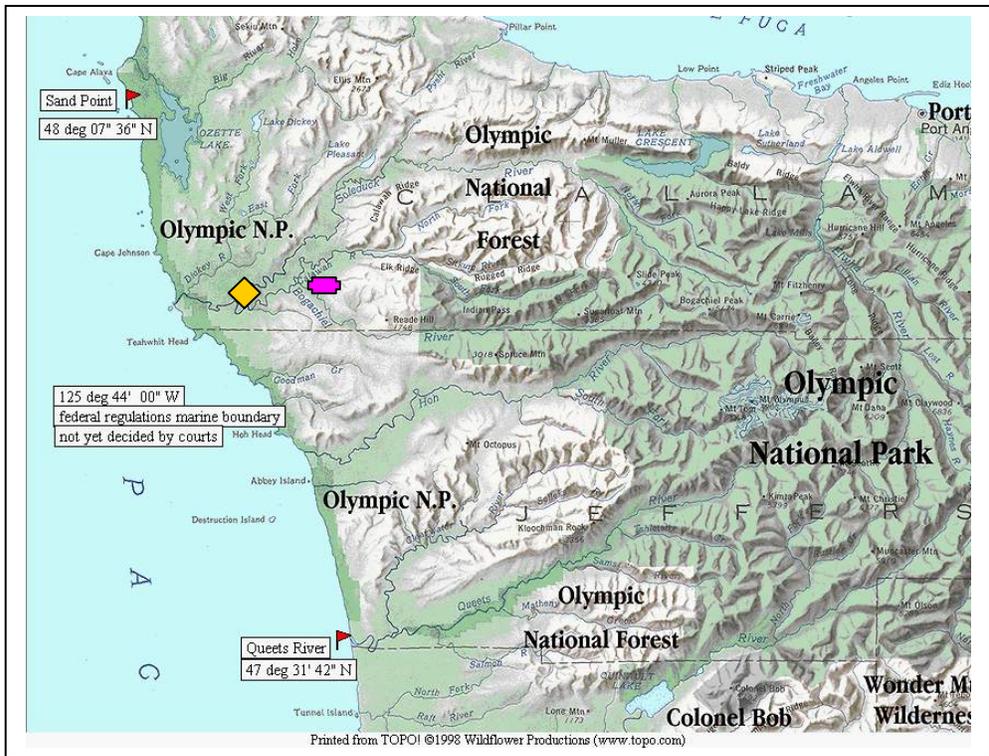
The terrain is gently rolling along the Pacific Coast and perhaps 20 miles inland. However, the Olympic Peninsula of Washington is dominated by a steep and relatively active young mountain range, the Olympic Mountains. These mountains trap most of the moisture from the Pacific, resulting in rainfall of 120-140 inches annually. The area lies within one of three temperate rainforests in the world, the others being in Chile and New Zealand. Native conifer forests that cover the landscape, both lowlands and highlands, are cut by numerous streams that flow into major river systems. There are two hardwood species—red alder and large-leaf maple. Important plants to the Quileute include red cedar, grasses, mushrooms, medicinal herbs, and berries. The cedar and grasses were used for clothing, canoes, baskets, harpoons, and other tools or weapons; and are still used for ceremonial canoes, basketry, and regalia. Berries, herbs, and mushrooms are still gathered for food and medicine. Camas used to be an important starch but is no longer a mainstay of the diet.

Salmon: The Quillayute River provides ingress and egress for 10 runs of salmonids that migrate through an extensive watershed of some 850 square miles. None of these runs is listed, either as threatened or endangered, although many are now diminished and might get ESA attention in the future. The Quillayute has only a 5.5 RM-mainstem that begins at Three Rivers and ends at the Reservation, where it meets the Pacific. There is no distinct estuary, but tidal influence and measurable salinity can extend up to Three Rivers, where the Quillayute’s confluence with the Sol Duc and Bogachiel Rivers occurs.

Tributaries. While the tributaries of the Quillayute are off-reservation, they must be considered because they all flow into the Quillayute River and their water quality and quantity directly affect it. Just past the reservation boundary, only one mile upstream, is the confluence with the Dickey River, which flows through lowlands—in fact, some 10% of its watershed is wetlands. This system is an important watershed for sockeye, steelhead, Chinook, coho, and resident trout. The Dickey has significantly high sedimentation in many locations, some due to forestry and some due to the unconsolidated nature of its river banks. Some streams also have been listed on the State’s CWA 303(d) list for temperature.

At Three Rivers, the Quillayute is met by the Bogachiel, which mostly winds through lowlands, some of which are agricultural. Not far from Forks, about 10 miles from Three Rivers, the Calawah River System joins the Bogachiel. The Calawah (North Fork, South Fork, and Sitkum) start in high lands and have extremely cold water in some locations. Part of the North Fork goes underground. Chinook, coho, sockeye, and resident trout are in this system. This is also where the Sol Duc River meets the Quillayute (hence the name of the town). The Sol Duc starts high in

the Olympic Mountains, south of Port Angeles. Fed by numerous tributaries and small lakes, it is home to sockeye, Chinook, coho, steelhead, and resident trout. Some Sol Duc streams have been listed as impaired waters (temperature, sedimentation, DO). This system has been harvested extensively, like the Dickey, Calawah, and Bogachiel. Both the Calawah and to a lesser extent the Sol Duc may have steep-slope mass wasting that contributes to the sediment load on occasion. Most sediment is anthropogenic.



This is a topo map of the Quillayute River drainage and shows surrounding Olympic National Park. It occupies the green band along the Pacific Ocean and the highlands of the Olympic Mts. Between it lie private timber lands (lowest), WA DNR forests (next), and then USFS (next). Timber operations (roads, cut trees) are NPSP potential issues. The Pink Block indicates City of Forks (population 3000). Three Rivers is shown by Yellow Diamond.

On the Pacific Coast, tribal members gather shellfish for subsistence. Clams are found at the high tide mark on coastal rocks and in the sand between the high and low tidal zones. Crabs for subsistence are captured in crab pots at the mouth of the Quillayute, and also by tribal fishermen, commercially, in the marine treaty waters. These shellfish may all ingest biotoxins from marine algae during harmful algal blooms. The conventional way to test is to capture specimens and send their flesh off for diagnosis at WA Department of Health. The sources of such biotoxins are enriched waters from natural upwellings, for the most part, although Victoria's sewage may be a factor at times.

2.2 Goal Statement

The purpose of conducting a nonpoint source assessment (NPS Assessment) is to insure that the Tribe's environmental goals are being adequately met through the ongoing programs of its Natural Resources Department. Furthermore, the assessment will provide a useful tool for planning management projects to improve nonpoint source pollution conditions.

The goals of the NPS Assessment, and the subsequent NPS Management Program would be to protect, and to restore as needed, the ecosystems vital to fish and wildlife in the reservation and within watersheds directly impacting it. We need the fish to remain at sustainable and harvestable levels, and provide a framework for these goals that invites partnering with the state, federal, and local or private entities that share in jurisdiction of adjacent lands and waters. To meet these goals it is essential to maintain the water quality of the Quillayute Basin, and in particular, the Quillayute River.

Subgoals: Habitat Protection, Environmental Education, Water Quality, and Water Quantity. These subgoals were examined for the extent to which nonpoint source pollution impacted them or was related to them.

2.3 Objectives

The objectives which relate directly to measurable NPS actions are as follows:

Habitat protection:

Restore habitat where invasive knotweed continues to flourish in river systems that flow into the Quillayute River and the reservation. Review timber harvest, road construction related to timber, and shoreline activities and conducted in the Tribe's treaty area. (Done largely through Lead Entity and Watershed Plan.) Explore possible funding to expand Army Corps of Engineers dredging in the Quillayute River estuary.

Environmental Education:

Make presentations to inform the public and promote ecosystem protection. Conduct special education projects.³

Protection/stabilization of Critical Stocks:

Conduct cooperative projects with local, state and federal agencies to prevent ESA status on stocks that are in some cases diminished (e.g., Sol Duc Chinook). We also are concerned about Lake Pleasant (Sol Duc River) sockeye, which only spawn on a lake experiencing

³ To some extent this is already being done by the environmental coordinator, either through tribal school programs under GAP, or by her interaction with partners in the Watershed Unit or Lead Entity, but the process is endless. New players emerge on a continuous basis, as well as replacements for current players.

more and more shoreline development because of its beauty. Efforts to get protective easements, to date, have not been successful. (Done through Lead Entity and Watershed Plan.)

Water Quality:

Develop nonpoint watershed plans under CWA 319 grants (currently through GAP)
Monitor and document water quality to protect fish habitat (done now under CWA 106).

Water Quantity:

Protect and restore in-stream flows for fish and human water needs (drinking, fire prevention, and some local agriculture/stock watering.) (WRIA 20 Watershed Plan was to be vehicle for this through state grants, although state has brand-new freeze currently for funds for this purpose.)

The ultimate measure for these objectives is the maintenance of fish stocks at sustainable and fishable levels, and an open, accessible mainstem river. Data on salmon escapement and harvest levels are developed by our tribal fisheries staff annually in meetings with WDFW and NMFS co-managers.

3.0 Methodology

3.1 Data Sources

Data were obtained from a variety of sources: from the state's CWA 303 (d) list, the Army Corps of Engineers supplemental EIS, the tribe's CWA 106 monitoring, and from the Phase II study done for WRIA 20, on Water Quality. This drew on a number of sources, including the Salmon and Steelhead Limiting Factors Analysis by the Washington State Conservation Commission in 2000 and some work by the Bureau of Reclamation. Streamkeepers of Clallam County has done some minor work upstream in Bear Creek of the Sol Duc watershed.

3.2 Evaluation

All water bodies of concern to the Tribe were listed and identified in relation to Tribal land. Two categories were identified: Waters on the Reservation (first RM of the Quillayute River, Smith Slough, Lonesome Creek, wetlands along Hwy. 110, and Pacific Coast—1 mile), and Waters within the Tribe's treaty-protected area, or Usual and Accustomed Area of the Quillayute Basin. The latter includes all Quillayute tributaries (4 rivers and their forks or creek tributaries) flow into the Quillayute mainstem and thus through the reservation and out into the Pacific at the mouth. These reservation waterbodies are shown best on the GIS map, above. The off-reservation rivers are shown on pages 8 and 10. The Tribe has a direct responsibility to prevent pollution and protect habitat in all waters where it reserves treaty rights. Because we cannot measure the water off-reservation absent

permission from landowners and grant funding, we have to make the assumption that the huge load of sediment continuously being dredged in the Quillayute on reservation derives from its upstream tributaries. *There is no way for it to be created in the last river mile, on the reservation.*

3.3 Assumptions

The primary assumption was that any waterbody impairment that negatively impacted the treaty rights of Tribal members to fish was an impairment of concern. All the upstream tributaries in the Usual and Accustomed Area flow into the Reservation waters, where subsistence, commercial, and ceremonial salmon fishing occur. A secondary assumption was that potential pollution that could negatively impact treaty rights was also of concern. A companion assumption was that the Tribal government has a responsibility to insure that its own facilities do not cause pollution. As noted above, drinking water is piped in from an aquifer 4.6 miles away so is not an issue here. See the Abby Hook and KCM references in the Appendix. They contain the only groundwater work, which in this area is quite slim. Meanwhile the Tribe continues to monitor its own wells for water quality. Sewage is discussed below under Land Use. The tribe has a sewer system and settling ponds, developed with assistance by Indian Health Service and Bureau of Indian Affairs.

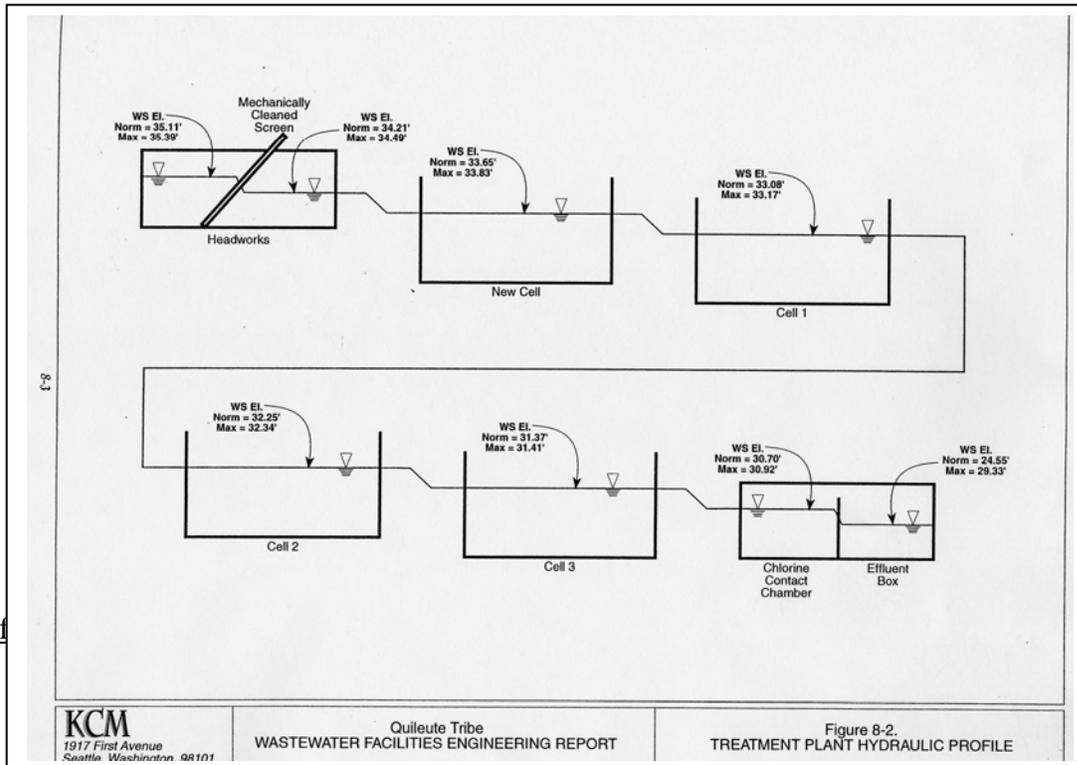
4.0 Land Use Summary

Tribal lands are of two categories: (1) Reservation Lands and (2) Usual and Accustomed Fishing Area (the water quality for which the tribe has treaty duties, shared with Washington, to keep the rivers fishable). The entire reservation (essentially a square mile) is owned by the Tribe. There are tiny tracts of isolated trust lands (Indian Country) in the U&A but these are not significant. The reservation is often quoted as having less than 1000 acres, but when one looks at the GIS map which includes James Island, and when one recalls that the river bottom is part of the reservation (*Moore* case), it is somewhat over 1000 acres. The Usual and Accustomed Fishing Area is over 1000 square miles, just the freshwater, land-based part (not marine), but only the Quillayute Basin (some 850 square miles, with 4 tributary rivers) affects the Reservation directly and is of significance for this report.

Land use types on the reservation include three small housing areas; offices/government administration buildings; a fish hatchery on Lonesome Creek; commercial operations (resort with cabins and trailer hookups; marina; and fish processing plant), public beach, and a cemetery. These uses are all located directly adjacent to sensitive waterbodies (Lonesome Creek, Smith Slough, Quillayute River, Pacific Ocean waterfront). The reservation area is zoned by the County as Rural Center.



Above is an aerial photo of the reservation from 1998. The arrow shows three waste water treatment tanks at a slight degree from vertical. Below is a diagram of their operation.



On

orth across

Quillayute River and on south and east boundaries). To the immediate west is the Pacific Ocean; therefore, to the west, the neighbor would be the State of Washington (3 miles out) and beyond that, Olympic Coast National Marine Sanctuary. With all of these neighbors, the Tribe has fisheries co-manager jurisdiction. Beyond Olympic National Park (“ONP”), on the land, there are state, private, and USFS ownerships of timberlands and a few towns and rural homesteads. At the highest elevations Olympic National Park resumes ownership (so it is bifurcated: coast and uplands).

There are only a few communities:

- La Push, on the Reservation, end of spur 110 (pop. 350)
- Three Rivers and rural environs, 6 miles east of La Push, on spur 110 (pop. 100?)
- Mora, at the end of Mora Road, near Rialto Beach of ONP (pop. 300)
- Forks, on U.S. 101 15 miles east of La Push (pop. est.3000)
- Beaver, on U.S. 101 perhaps 10 miles NE of Forks (pop. est. 300)
- Sappho, on U.S. 101 at spur 113, another 5 miles east (pop. est. 300)

The first major cities—populations approaching 20,000—are Port Angeles 75 miles to the ENE, and Aberdeen, 100 miles to the south. Between Forks and Aberdeen are tiny communities of Kalaloch and Neilton, but these are beyond the Quillayute watershed.

NPSP sources off reservation: Areas that may need some closer management of nonpoint source pollution include the Lake Creek Transfer Station for municipal waste near mile marker 199 of U.S. 101 (it is grandfathered as to liners); the Forks Industrial Park (at Sitkum/Sol Duc Road and U.S. 101 just north of Forks); and a Beaver, WA trailer park. In addition, rural dwellings around Lake Pleasant have been on the increase (Upper and Lower Lake Creek of the Sol Duc Basin surround Lake Pleasant). Forks has a sewer system and waste treatment plant and more recently stormwater planning. Forks also has septic systems. The state of their compliance is unknown.

Timber has been the main industry. Besides cutting trees, there are related businesses, such as manufacturers of cedar shingles and biomass fuel (new). Other employers include state correctional centers (facilities off our U&A) and government natural resources offices (USDA FS, WDNR, and WDFW). The towns have motels, grocery stores, gas stations, hardware stores, a few clothing stores, a few crafts shops, and in the case of Forks, a small hospital.

Relatively flat areas lie very close to the coast or along the Dickey River, the downstream half of the Bogachiel River, and the Quillayute banks downstream of Three Rivers. Elsewhere, topography is rolling hills until one gets to the higher and steeper parts, which are in ONP.

4.1 Navigable Waters, Sources of Nonpoint Source Pollution and

where they might occur in areas managed or co-managed by Quileute

Navigable Reservation Waters: Pacific Ocean along First Beach, west side of reservation; Quillayute River—one river mile bordering N side of reservation. After 1 RM, becomes Olympic National Park. Smith Slough—small creek to E side of reservation, originates in reservation and flows into river. Lonesome Creek—tiny portion originates to SE of reservation in Olympic National Park, then flows onto reservation running E-W and exits into Pacific Ocean.

Navigable U&A waters: Lake Ozette basin, river basins that flow into Quillayute (Dickey, Sol Duc, Calawah, and Bogachiel. A few independent drainages to S of reservation and N of reservation (small creeks flowing into Pacific—all in timberland).

<u>Category</u>	<u>Subcategories (R = reservation and U&A= off-reservation lands with treaty responsibilities)</u>
<u>Silvaculture</u>	<ul style="list-style-type: none"> • Harvest on slopes—R and U&A. Tribe has one square mile of reservation and for minimal timber on it, developed Forest Plan with BIA in 2006. • Harvest on riparian zones—U&A only, data from WDNR, USFS, and watershed analyses (WSA). • Rd. construction/maintenance—R, U&A (WSA data)
<u>Agriculture</u>	<ul style="list-style-type: none"> • Cattle on a few small “ranches”—U&A only. (allowed to graze near creeks, may pose fecal coliform issue, but probably less than elk. Source—discussions during state watershed planning. No formal studies.)
<u>Hydrologic/Flow Modification</u>	<ul style="list-style-type: none"> • Stream bank modification –U&A only. This is in part by homesteaders clearing view to rivers (data), but a major portion is due to invasive knotweed. Some has been removed by Quileute+partners. (data, assessed by tribe). • Culverts—U&A mostly. R--One belongs to county road on reservation. (data, assessed by state and tribes) • Dredging—R. Army Corps of Engineers clears river access to ocean under Rivers and Harbor Act. Funding limited, so dredging is also. (data). • Gravel mining—U&A only (data, state permits).
<u>Runoff</u>	<ul style="list-style-type: none"> • Surface runoff. R and U&A. Reservation is too small to require storm water plan. City of Forks 15 miles away has storm water plan. The rest is timberland except for some small homesteads (data)
<u>Construction</u>	<ul style="list-style-type: none"> • Land Development—R and U&A. Far more extensive in U&A. Some timber cleared for housing on reservation.

	<ul style="list-style-type: none"> • Road development—U&A. Mostly to access timber. Must follow Forests and Fish regulations. Sometimes contractors don't. Our TFW biologist works with timber operators on these violations. (Data from permits, ID teams) • Leaking septic—U&A—degree unknown, but rural areas and part of City of Forks are on septic. County is in process of formalizing septic maintenance rules. The reservation is on sewers and has IHS/Ecology solid waste program for sewers.
<u>Habitat Modification</u>	<ul style="list-style-type: none"> • Removal of riparian vegetation—R and U&A. In U&A-- Mostly by private home owners. Timber leaves buffer. (data from forest practice applications, watershed analyses). • <u>On reservation</u> we only have two creeks and they are not in areas where buildings are except for small part of Lonesome Creek -- hatchery. Smith Slough—totally wild banks. Quillayute River—one side is jetty to protect Rez from Pacific, and other side cleared for seafood plant, marina, Natural Resources bldg., and one home. The rest is wild. Only 1 river mile is on reservation. Then you enter Olympic National Park. (Data, observation) • Invasive knotweed species—R and U&A. There are four types if you count hybrids. Knotweed displaces the native riparian plants that fix soil on the banks, provide leaf litter, and nutrition to the hyporheic zone. Tribe has been working with County and Olympic National Park and under BIA grants removed knotweed on reservation and in Dickey, Sol Duc, and Calawah Rivers. Bogachiel River knotweed has been mapped but no funds remain for our removal. We keep seeking grants. (Data, assessments by tribe and partners)
<u>Marine Activities</u>	<ul style="list-style-type: none"> • Marina—government, commercial, and private boats --on R. Any oil issues are purview of USCG, which has a station and monitors and fines as needed. (Data, observation) • Creosote pilings—R. These have been removed about two years ago but used to pose a concern. (Data, observation) • Harmful algal blooms—U&A. Pacific Ocean, seasonal and naturally occurring, impact safe consumption of shellfish. Tribe monitors regularly and works with WA Dept. of Health and WDFW on this. Posts results on web and by phone hotline. No shellfish on high-energy First Beach of reservation. Need to go S on the U&A beaches for harvest. (Data with UW, WDOH, ORHAB, tribes including Quileute) • Fecal—R and U&A. On First Beach, Surfriders monitors for

	<p>fecal. Sometimes they report what are considered exceedences but not high ones. There may be boats dumping illegally in the vicinity, and it could wash up onto First Beach waters. First Beach is very high energy and disperses water tidally. There are also offshore currents. In the U&A, probably marine mammals and boats dumping create fecal waste. Fecal monitoring is difficult and costly and the tribe relies on Surfriders. (Surfrider data plus best judgment re marine mammals and recreational boats)</p>
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The following is an alternative way to view how the tributaries impact the Quillayute River.

4.2 Nonpoint Source Pollution Sources—U&A: Source=Limiting Factors Analysis by Washington Conservation Commission, 2000, building on watershed analyses and other materials.

Waters Entering Reservation Waters (continued next page)

River	Tributaries in study	Pollution	Source	Severity
Dickey River	E, W, and M. forks of Dickey Coal Creek, Colby Creek, Squaw Creek, Ponds Creek, Stampede Creek, Thunder Creek, Skunk Creek, Gunderson Crk	Sedimentation* DO/temp* *Dickey naturally shallow and banks mass-waste readily, but timber road construction is very high concentration and streams are not well shaded.	Silviculture + natural Silvaculture + natural	Moderate Moderate
Sol Duc River	N and S Forks, Tassel Creek, Shuwah Creek, Gunderson Crk, Swanson Creek, Bockman Creek, Lake Creek, Beaver Creek, Bear Creek, Kugel Creek, Camp Creek, Goodman Creek, Alckee Creek	Sedimentation/temp Septics may become issue as area around Lake Creek and adjacent Lake Pleasant is developing rapidly. Residents use wells and septic systems.	Silviculture Habitat modification	Moderate moderate
River	Tributaries in study	Pollution	Source	Severity

Calawah River	N fork, S fork Sitkum trib. Cool Creek Devil's Creek	Sedimentation	Mass wasting Silvaculture-- roads	Infrequent moderate
Bogachiel River	Grader Creek, Mill Creek, Hemphill Creek	Sedimentation, runoff Fecal, other	Silvaculture, gravel pits. City of Forks construction* City septics Agriculture *Forks has a stormwater plan	Moderate Unknown, probably low

4.3 Discussion of Sources and Types of NPSP

As stated above, the primary pollutant in all waterbodies assessed is sedimentation. The sources are numerous, disperse, and difficult to control as timber harvest is regulated in the state under the Forests and Fish Act, and regulations of the Department of Natural Resources. In the case of upland reaches of the Sol Duc, Calawah, and Bogachiel Rivers, sometimes mass wasting occurs from, presumably, tectonic activity or unstable slopes. However, in some cases steep-slope timber harvests exacerbate the issue. In the Dickey River, some bank instability is natural, because the materials are unconsolidated, even though the banks are low. Most sediment is attributed to timber access road building and timber harvest itself, in all the tributaries. Most of the lands making up the Quileute U&A are either Rayonier Inc, WA DNR, or USFS forests. Only a small belt around the reservation is Olympic National Park, as well as the very highest reaches of the rivers. The City of Forks has a stormwater plan. However, uncontrolled stormwater runoff from recently harvested timber, and development outside the Forks City limits, contribute to sedimentation in the rivers.

Insignificant amounts of fecal coliform bacteria come from the feces of warm-blooded animals, including herds of elk (extensive out here), scattered cattle ranches with direct access to streams, leaking septic systems (degree unknown), and marine birds and mammals. The tribe has had *very limited* success discussing how to control cattle access to streams with landowners. The clear issue out here is sediment from road building and timber harvest. Since both are regulated and enforcement is limited, the tribe's work is cut out for it.

5.0 Water Quality Summary of Conditions

Only surface water quality is addressed in this Assessment. As can be deduced from the 2004 Phase II report for WRIA 20 Planning Unit (see Hook, A., in Appendix), there is very little ground water in this area has really been mapped. Knowledge is unconnected, and uncorrelated.

However, the tribe has well data from the work done for its aquifer wells in Three Rivers, about 6 miles away (source of drinking water). This was done by Indian Health Service, BIA, and Ecology since local water (Reservation) has too many salts, especially manganese.

5.1 Surface and Ground Water Quality Summary

1. Existing Conditions of tribal waters

- a. *surface water hydrology and quality*—The Tribe has conducted its own studies on surface water and has participated in several watershed analyses. Data summaries are in tables, below. We also have graphs of the CWA 106 monitoring the past year (shown below). This just resumed in FY 2008 after a hiatus due to loss of technical staff.

In 2006 the Tribe completed an Assessment of Restoration Projects (salmon habitat) in the Quillayute Basin, performed with BIA funds and partnership with all public and private landowners/timber operators and state agencies. This document is public (part of Lead Entity Salmon Strategy for WRIA 20 (North Pacific Coast Lead Entity and also was given to all participants. It was also evidence in US v WA 2001-1 (culvert case). Projects prioritized included knotweed removal, road decommissioning, and culvert replacement. (See CD accompanying this report for documents).

The Tribe assessed and made GIS maps of knotweed in the Quillayute Basin with assistance of partner Clallam County, and BIA funds. While all has been removed in most of the Quillayute (over five years and with local and federal partners), the Bogachiel, a major river, still has weed. We have run out of funds to do more. (Maps of what remains on CD, accompanying this report).

- b. *groundwater hydrology and drinking water quality*—Very little has been done to study groundwater. In October of 1989, Northwestern Territories, Inc. of Port Angeles issued its report, “**Quileute Water Facilities, Water Development Analysis**” to evaluate La Push wells for continued tribal water supplies. The La Push groundwater contained high levels of manganese (Mn) and iron (Fe) content. There was concern about the concentration of these minerals and also about the impact of sea water on aquifers during periods of low flow of the Quillayute. While the Mn and Fe levels were tolerable for human health, high tides did allow tongues of sea water to infiltrate some of the wells (#1 and #2) and the threat of long-term difficulty could not be ruled out. Wells #3 and #4 appeared to be operable and have the necessary protective casings. Well #3 lies within Olympic National Park.

The area of Three Rivers was tested because of the availability of excellent drinking-quality water in this location (4.6 miles east of the Reservation). This aquifer was tested both for water quality and quantity (capacity). The aquifer is shallow and therefore readily accessible. It is protected from river meandering because of channelization,

revetments and bridges.

In 1990 the same company produced a publication of IHS and the Tribe entitled “Alternative Water Source Facilities Plan for Community of La Push.” This report contains some interesting history of the La Push water sources, which date from 1917. The wells are only 1300 feet from the Quillayute River estuary. The closest other utility at the time of this study was the City of Forks, some 15 miles away.

The main thrust of this study was to investigate alternative water supply sources and to examine costs of continuing with the antiquated well system on the Reservation. The main concerns with that system were the capacity for growth, leaks in the corroded pipes, and Mn and Fe levels. Additionally, high natural organic acids derived from the swampy conditions in the surrounding woodlands when combined with chlorination could produce potentially toxic trihalomethane compounds. The organic acids increase the solubility of the manganese and iron minerals, as well. These pollutants as well as encroaching seawater chlorides are difficult to remove—the pressure filters and treatment chemicals were placing a large burden on the Quileute Tribe, financially. The bad flavor of the water was impairing business of the Quileute resort.

Three Rivers’ aquifer was again mentioned as a viable alternative for development.

The only other groundwater study done was research on the impact of harvest on temperature of wetlands that feed groundwater near stream channels. This was done as part of the Dickey watershed analysis and the conclusion was that harvest of wetlands cover does impact non-contiguous streams’ temperature. We believe this has a role in the higher than desirable (for salmonids) temperatures found in many localities of the Dickey watershed.

6.0 Water Quality Standards (*Using State, Quileute does not have own*)

The Navigable Waters on the Reservation as stated above are the Quillayute River, Smith Slough (an independent tributary wholly on the reservation, and Lonesome Creek (starts in Olympic National Park and flows through the Reservation to the Pacific Ocean). *See Map on page 5.* The wetlands are not navigable, totally overgrown by brush and quite shallow. They are between the resort and the entry road State 110, and arguably man-made by the road construction’ s creating a rise. But they have been there for decades, at least. **At this point in time all navigable waters are in “good” condition, not listed under CWA 303 (d).** The beach of the Pacific Ocean is a waterbody and is navigable. It is not being surveyed except by Surfriders for fecal coliform. The tribe is only surveying the fresh water Quillayute, Smith Slough, and Lonesome Creek at two points, for its CWA 106 grant just now. **However, the problem is the volume of sediment shallowing the major river mouth (Quillayute) to the point that it is not functional without regular artificial sediment removal by Army Corps of Engineers. And of late they have abated their work because of federal funding. Even the**

USCG had to complain to Congress about this.

The tribe is using state water quality standards. As is explained throughout, this is a very small reservation less than 1000 acres (a little over one square mile) of which only about 800 acres are land (tribe owns river bottom and James Island and water between, which has a land bridge during summer low tides). We are surrounded by Olympic National Park and then private lands beyond the park. They use state standards. This tribe does not find it economically feasible to develop special standards for its one small area, especially when the Park is so close and uses state standards. We also cannot afford the staff to go through the process of establishing and maintaining our own standards.

The Tribe took training in how to use a Hydrolab in 2000 but that was under GAP and we did not have a QAPP. Further, we lost both of the technicians to other jobs. Only this past year and a half and for the rest of FY 2009 are we doing testing for water quality under CWA 106 with a QAPP and it is Tier One, for pH, temperature (T), turbidity, and dissolved oxygen (DO). Below are histograms we have developed and other graphs. We don't believe such a short period of time is conclusive of water quality. Another problem is that we are not testing it in the Usual and Accustomed Area because of EPA funding restrictions to date (a PPG may make that possible and we are applying for same this spring of 2009). The Quillayute is such a large and wide river that it will take enormous changes to make it onto the 303(d) list for any of the above. The main thing we see is continual shallowing of the estuary, which is nearly the entire part of the river in the reservation.

7.0 Water Quality Results

The next several pages show data and graphs of turbidity in our four reservation localities for December 2007 through March 2009. We had to train the two new technicians in October and November of 2007. Also we show histograms of temperature, dissolved oxygen, and pH.

In summary we are testing in four localities: Quillayute River marina, Quillayute River right near mouth of Smith Slough, Lonesome Creek next to hatchery, and Lonesome Creek water in settling pond somewhat downstream from first site. We are only testing for temperature, dissolved oxygen, turbidity and pH. We are in Tier One for CWA 106 monitoring, in the middle of the second year.

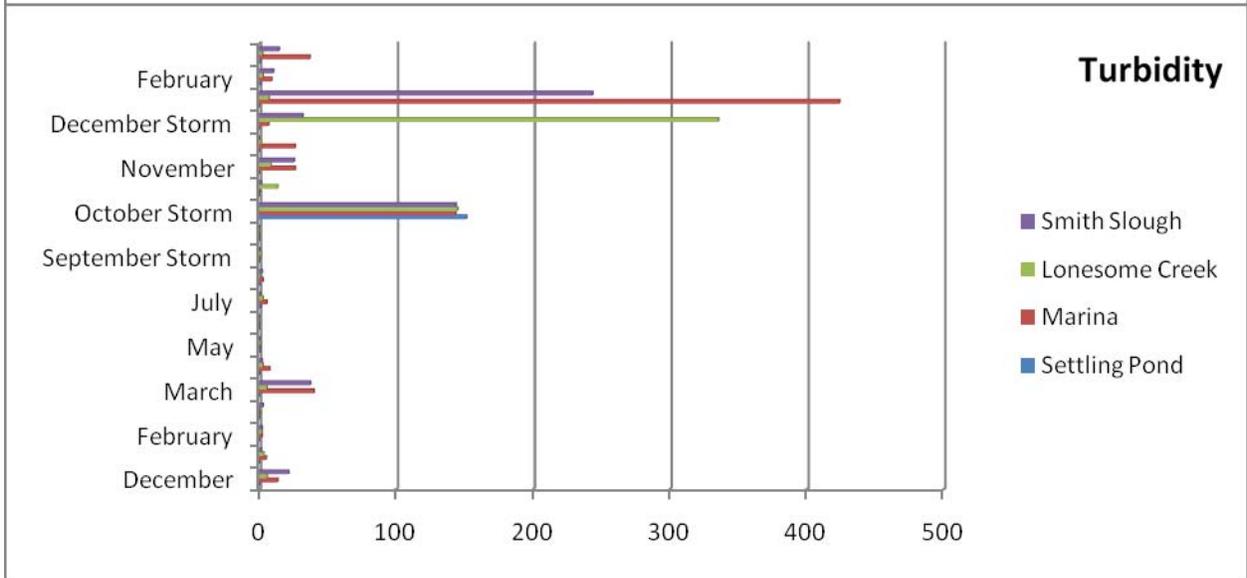
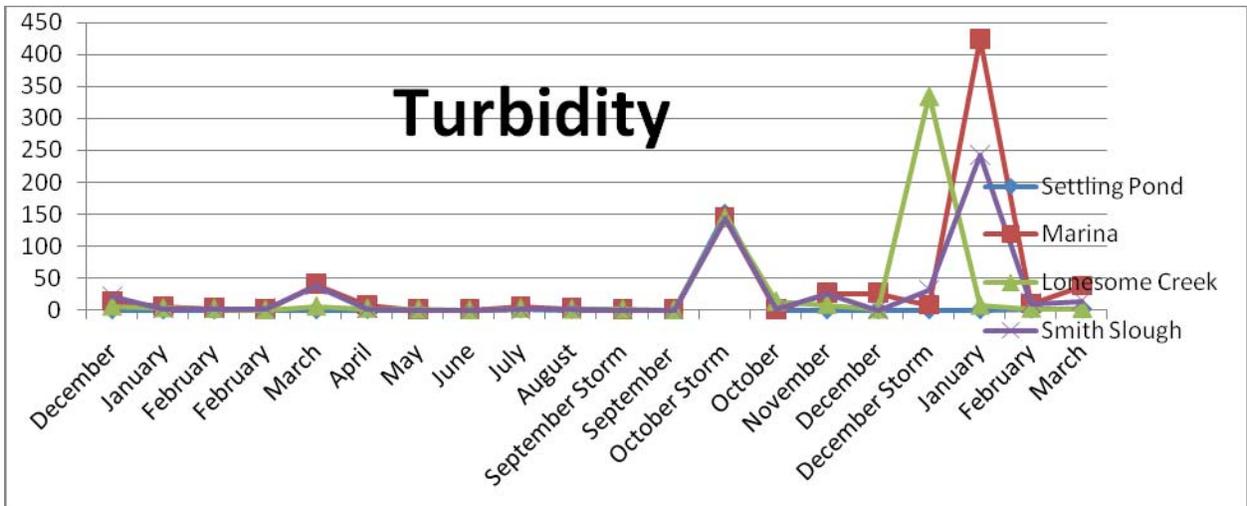
The tests show that freshets after storms greatly increase the turbidity at our monitoring sites, but that DO, T, and pH are more stable and less affected. This would suggest a great deal of sediment is coming from the upstream rivers of the tributary system: Dickey, Sol Duc, Calawah, and Bogachiel. We have removed most of the knotweed from all but the Bogachiel, a very large system. All four rivers' basins are actively harvested for timber, especially the Dickey. All are crossed by timber roads. The Army Corps of Engineers is planning to dredge the river in part this fall, so the USCG can use the mouth—this makes our point even better than anything we can say.

7.1 Tables and Graphs of results

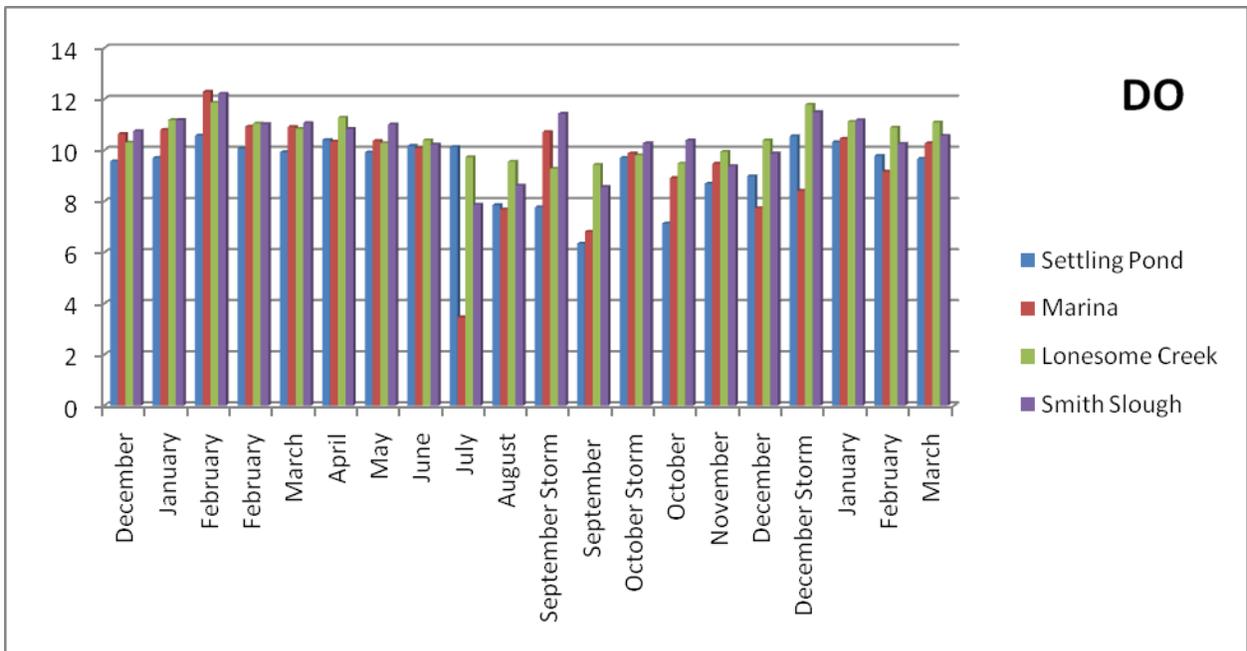
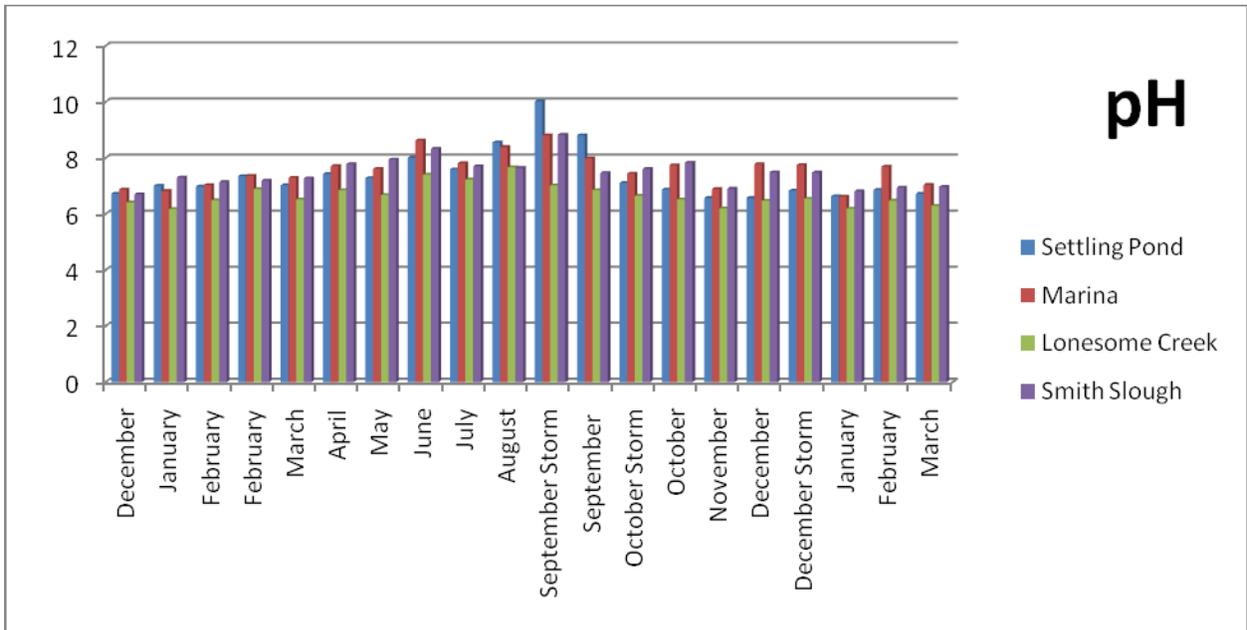
TURBIDITY IN NTU

Month	Settling Pond	Marina	Lonesome Creek	Smith Slough
Dec-07	0	13.4	5.8	21.7
Jan-08	0	5.1	3.3	1.7
Feb. 2008	0	2	2	2
Feb-08	0	0.5	0	2.9
Mar-08	0	40.03	5.7	37.4
Apr-08	0.4	7.7	2.7	2.1
May-08	0.8	0.8	1	0.4
Jun-08	0	0	0	0
Jul-08	1.3	5.6	2.8	1
8-Aug	0.5	2.9	1.1	2.1
September Storm	0	0.8	1.4	0.4
Sep-08	0	0	0	0
October Storm	151.5	143.6	144.9	143.8
8-Oct	0	0.6	13.5	1.7
8-Nov	0	26.3	8.7	25.5
8-Dec	0.1	26.3	1.4	0
December Storm	0	7	335.6	31.9
Jan-09	0	424	7.1	243.6
9-Feb	1.2	9.1	2.9	10.5
9-Mar	1	37.1	2.5	14.6

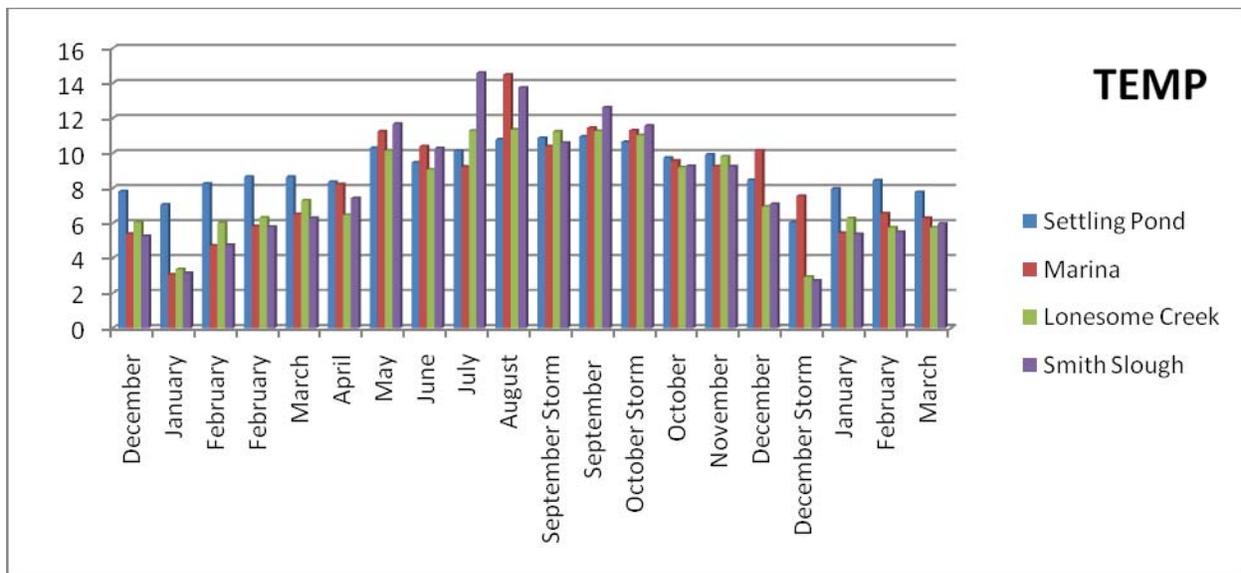
Graphs on next page....



*TURBIDITY UNITS
IN NTU*



Dissolved Oxygen units are Milligrams/Liter



The temperature is in degrees Centigrade.

From the above one can see the major issue after storms is turbidity.

It is our best professional judgment that unconsolidated banks (knotweed, land clearing, and natural highland unstable slopes) and newly or as yet unplanted timber lands after clearing are the causes of sediment influx after storms. This is difficult to document when we are only taking measurements on the reservation.

7.2 Federal, state, and local programs for reduction of NPS Pollution. This all regards the U&A except for the Corps dredging, below, which is on reservation.

- **Ecology:** There are some 303(d) listings for the Sol Duc, Dickey, and Bogachiel Rivers, for temperature or dissolved oxygen (DO). These have been in place for a long time. In this remote, non-urban, and non-agricultural area, there is a virtual policy stall while agencies debate the role of the **WDOE and the EPA in delisting** impaired watersheds, and the methodology. It is the opinion of the Quileute that while the Dickey is naturally shallow and has unconsolidated banks that contribute sediment periodically, the fact that this watershed has been heavily harvested for timber for decades, is criss-crossed with timber roads, and lacks good riparian buffers in many places contributes to the shallowing and higher temperatures which sometimes exceed 17° C (salmon limit for health). While timber complies with buffers, high winds from the nearby coast knock them down shortly after they are created after harvest (wind throw).
- **Ecology:** Funds watershed planning. Quileute has been part of WRIA 20 Watershed Planning under RCW 90.82 since its inception some 7 years ago as an Initiating Government. Ecology funded the teaming of local, tribal, and private parties to assess and plan Water Quantity, Water Quality Fish Habitat and Instream Flows. We ran out of

time and money to do the last but produced lengthy documents on the first three and are now in the Implementation Phase. Unfortunately Ecology has run out of money to fund our recommended Implementation on-ground work and can only fund planning and facilitation. (Some of the documents are on the CD accompanying this report.)

- **Ecology** at last finalized its water quality standards after huge protest from the tribes and cooperation from EPA, NOAA, and USFWS to get acceptable standards. Quileute had a struggle getting the Dickey watershed protected for spawning and rearing water quality. Steelhead and coho use the river all year long but Ecology was not accepting it. WDFW came to our assistance.
- The State **Resource Conservation Office** funds salmon habitat restoration through Lead Entities and Regional federations of Lead Entities (RCW 77.85). Quileute has been in a Lead Entity for WRIA 20 for 8 years now and has won four projects (cross drains in Dickey/Ozette to control sediment runoff, two culvert replacements in Sol Duc basin, and Large Woody Debris Placement in Calawah Basin. Our LE is part of Washington Coast Sustainable Salmon Partnership.
- **USDA FS** within its operational areas (here, Olympic National Forest) consults with the Tribe about harvests and provides a means of input regarding impact. We have been involved in three **watershed analyses** that include their lands: Sol Duc, N Fork of the Calawah, and Sitkum/S Fork of the Calawah. They have been concerned with **road maintenance or decommissioning**, and have had to deal retroactively with mass wasting events, especially in the Sitkum.
- **USDA FS** has partnered with the Tribe in large woody debris placement (donated trees and did NEPA work) to trap sediment in Hyas Creek of the Calawah Basin (finished 2008). This was state-funded (grant).
- **USDA FS** has a knotweed and other noxious weeds program newly developed. It has worked in the Quinault area but not yet in this area. It published its draft EIS in 2004 and a ROD in 2005 (CD appendix).
- **USFWS** funds knotweed reduction but did not fund this tribe. We have programmatic problems getting their funding (versus competition) because the fish in the Quillayute are not ESA-listed.
- **USCG** has responsibility for water quality impaired by oil spills and has a station here in La Push on the reservation.
- **Olympic National Park** has a knotweed eradication program. It trained Quileute in foliar spray techniques and partnered to remove the weed at the confluence of the Park with the reservation.
- **Army Corps of Engineers** regularly dredges the Quillayute River (used to be annually and now is about every two years) to maintain access to the ocean. (Rivers and Harbors Act). EPA certifies this project from a water quality standpoint. The sediment from upstream activities is shallowing the river mouth throughout the reservation. The Corps works with tribal fisheries to assure there is no conflict between dredgers and fish runs (10). The tribe owns the river bottom. The dredge material in part is used to replenish neighboring Rialto Beach for smelt (EPA-permitted project in cooperation with Olympic

National Park. Rialto has become highly erosional, after historically being depositional. This is likely due to the change in the placement of the Quillayute mouth and then maintenance of that position with a jetty to protect the tribal village. (In prehistory Quileute was not placed in one-square-mile reservation and could move about, but now they are.) Corps published an EIS with water quality and fish sections in the 1980s and updated this in 2000. They did a water quality study in the Quillayute in that year.

- **USEPA** funds General Assistance Program for preparing TAS for CWA 106 and 319. It certifies Army Corps of Engineers dredging. It funds CWA 106 monitoring.
- Timber harvest reduction is case by case, dependent on the cooperation of **timber companies** with concerned tribes. We have the good fortune to be working with Rayonier on several solutions, based on prescriptions of the Dickey and Sol Duc watersheds—cross drains to redirect sediment from roads, away from ditches and onto the forest floor. **Quileute and Rayonier** have cooperated in some alder removal/conifer planting projects on the banks of the Dickey to strengthen stream banks and create shade.
- **Clallam County** is the lead agency pursuing state programs for habitat restoration, establishing North Pacific Coast Lead Entity and WRIA 20 Watershed Planning/Implementation Group. Members include Clallam and Jefferson Counties, City of Forks, the tribes of Hoh/Quileute/Makah, interested public, non-profits, local business, and federal/state agencies desiring to participate.
- **Clallam County Noxious Weeds Control Program** has been a vigorous educator of the public and a vigorous knotweed remover. Its coordinator goes all over the region teaching technique and is the energy behind the now active Olympic Knotweed Working Group, comprised of state, local, tribal, federal, academic, and private parties who meet several times a year and compare technique. Official training maintains WA Dept. of Agriculture certification for knotweed removal accordingly to law. The coordinator also provides training, equipment, and pesticides to help others remove knotweed. Quileute has partnered with the county for over 5 years now. All protocol complies with EPA, Ecology, and WA Dept. of Agricultural specs for use of and application of herbicides.
- **The Tribe** has maintained a vigilant Natural Resources Department that emphasizes dialogue with neighboring landowners, both governmental and private, so that we can be included in their harvest decisions and share labor and costs in case by case restoration programs. We are always on the lookout for monitoring programs and have several in the hopper should grant money become available for staffing. (We find it interesting that so many projects “mandate” post-operative monitoring, but only fund for the one year of restoration.) We participate in forestry application review and ID teams.
- **Quileute** has with BIA funding (Watershed restoration program no longer available) conducted four watershed analyses with its partners in the 1990s and habitat assessment in 2005-6 to update these. We repaired several culverts with bridges with BIA funds and stabilized banks with LWD. A complete list of these types of projects is in the Appendix CD with this report. We streamtyped for fish presence and over past five years, assessed and removed knotweed from several watershed sites in the U&A and reservation.
- **Quileute** has used EPA GAP money to initially assess water quality in the streams (1990s) and since then to fund a grant writer and policy person who attends the various

intergovernmental committees related to water quality and salmon restoration and provide tribal perspective. This person obtained TAS for CWA 106 and is working on this 319 project now.

7.3 Reservation Nonpoint Pollution Management and studies

1. *Water bodies.* Besides the Quillayute River there are (1) Lonesome Creek, which provides fresh surface water for the Tribe's on-reservation hatchery—flows into the Pacific; and (2) Smith Slough—flows into the Quillayute. There is a small wetland between the beaches and the state highway 110. This is not navigable. The Tribe owns the riverbed of the Quillayute River within the boundaries of the Reservation, pursuant to a 1940s federal court decision for the U.S. as trustee for the Tribe. (*Moore vs. U.S.*, Ninth Circuit Appellate Court).
2. *Hydrologic modification.* The Army Corps of Engineers regularly dredges the Quillayute River within the confines of the Reservation.⁴ This project is mandated by the Rivers and Harbors Act, as La Push is a safe harbor (one of only a few on the western coast of Washington), with a Coast Guard Station and a small, tribally operated marina. The term “safe harbor” is euphemistic; this area is hit by violent winter storms and the natural protective spit that extends south from the mainland on the north side of the river has been breached on more than one occasion, leaving the village of La Push, the tribal community on the Reservation, vulnerable to strong wave action. The Corps has built up storm protection with dredge material, concrete, and wood, creating a protective jetty and artificial river bank. The dredging is essential, but its impact on fish migration is uncertain. The Corps has from time to time studied this problem of conflicting concerns with a committee composed of federal and state agency representatives (ACOE, USFWS, USEPA, Washington Governor's Task Force, and WDFW) and tribal personnel. The last dredging was in March of 2008. Federal funding for the future is a question mark.
3. The Pacific coastline is part of the Tribe's Usual and Accustomed Fishing Area. Harmful algal blooms (“HABs”) are a chronic problem out here. Their relationship to nonpoint source pollution from rivers is still being determined by researchers around the country. Once ingested by shellfish, the toxins in the algae pose a health risk to humans, when the toxins reach a certain level. The Natural Resources Department staffs a marine biologist and water quality technician who regularly collect shellfish and seawater for analysis. The shellfish have been sent to Washington's Department of Health in a cooperative project. Results are regularly posted for public information to avoid health risks. Recently the Tribe has been working with NOAA to develop a continuous monitoring program. This cooperative relationship is still in its formative stages. Our marine biologist is working on a program that can determine toxicity from seawater samples rather than costly sampling of

⁴ The Corps has been hampered in its duties by Congress of late, because funding has been limited to commercial deep water ports. Partly because of environmental justice and partly because of the USCG need for access, the ACOE has pulled together left over funds here and there and kept up most of its dredging obligations. We can't say what the future holds in this regard.

shellfish tissue.

Surfriders, a non-profit, regularly tests First Beach Pacific waters for fecal coliform. They post their findings.

4. *Sewer facilities.* The tribe has a BIA-funded wastewater treatment plant to handle human waste. (See diagram above.) Waste is carried to the treatment plant by sewer lines that connect to sewer mains in the roads. The treatment plant includes settlement tanks and soil filtration of discharged water. There is a water quality lab where samples are regularly tested. This project was the subject of a recent three-year study funded by the Indian Health Service and Washington's Department of Ecology. KCM, Inc. of Seattle did the engineering review (final published September, 1998). The project is slated for upgrades by Indian Health Service in the coming years.

Issues may one day involve the capacity of the holding tanks and the capacity of the soil to filter discharge. When IHS and contractors designed this system, soil filtration was considered adequate. The reservation population of 300 is stable.

5. *Drinking Water.* There is no sole-source aquifer under the Reservation. The Tribe gets its drinking water from an aquifer near Three Rivers, about 6 miles away. This well water is approved as potable by the State of Washington. It is piped to the Reservation. The EPA recently funded an aquifer study. (Wellhead Protection, 1999.)
6. *Municipal Waste.* The Tribe has garbage trucks and regular garbage disposal—waste is hauled to a transfer station as part of the Clallam County Waste Disposal Plan, to which the Tribe subscribes and is committed. The Tribe used to have a dump site (tires, cars, etc.) at Thunder Road on the Reservation, but with Indian Health Service assistance, this has been completely removed/closed down/cleaned up. From time to time midnight dumpers would come all the way from Forks to dump on this area. The Tribe has fenced it off and padlocked the fence. The main reason for this behavior is the high cost of disposing of such large materials at the Lake Creek Transfer Station, relative to the low incomes of locals.
7. *The Marina—vessel pollution.* The USCG monitors unauthorized discharges into the water and initiates enforcement when applicable. It asserts jurisdiction on this matter.
8. *Underground storage tanks.* These were removed several years ago under various EPA and BIA funding. There are believed to have been five on the Reservation.
9. *Construction.* When applicable, the Tribe has conducted environmental impact statements or assessments under NEPA (e.g., marina, housing, new clinic, new natural resources building). Most structures are modular and require little disruptive activity to install. In almost all cases they are replacements in the footprint of a prior structure. One exception was the new

gym (about 4-5 years old now), handled by a Seattle contractor with all NEPA requirements met.

10. *Storm Runoff.* The bulk of the land on the Reservation is unpaved. There are a few main roads that have asphalt pavement (1-mile continuation of State 110 into the reservation, two small circles for accessing housing, and about another mile of roads down by the river. The Tribe does not have storm sewers. However, this is a low priority because areas unpaved are either covered with vegetation or gravel/cobbles. We have not observed runoff problems. Soil drainage is excellent in this area.
11. *Pesticides/Herbicides.* Most weeds are controlled mechanically. Between 2004-2008 the Tribe had grants from BIA to remove knotweed in various watersheds of the U&A and with some left-over pesticides removed some reservation knotweed. We used herbicides approved by EPA and Ecology and technique approved by WA Department of Agriculture and Olympic National Park. This application is now complete. Protocol is included further below.
12. *Agriculture.* There is no agriculture on the Reservation. A few people have gardens.
13. *Silviculture.* There has minimal silvaculture or timber clearing on the very small Reservation. Some occurred last year, however, to clear an area for housing. Some timber was cleared for a housing development several years back, and an EIS was conducted for HUD. The homes are modular, so impact was minimal. No stream was adjacent to that development. The Tribe has a Forest Plan that our TFW Biologist worked out recently with BIA's Aberdeen, WA office.
14. *Toxic industrial discharges.* The only industrial activity on this Reservation is the fish processing plant. The wastes from this plant are not toxic (fish parts) and are removed by waste disposal services.
15. *Hatchery.* The Tribe's hatchery point source effluent is too low a volume to require an NPDES permit under recent tribal hatchery guidelines by EPA, per our hatchery manager, who is following the EPA programs on this matter.

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Summary Table of Waterbodies on Reservation.—

status in bold italics in 4th column; Where we have data, indicated in plain boldface type.
All of these are monitored under CWA 106 except wetlands (last category)

Waterbody	Sediment	Temperature, DO, pH	Chemicals	Sources	Assessment= <i>Good to Fair (after storms)</i> Remedies
Quillayute Mainstem—6 miles long, originates at Three Rivers, but only one stream mile is on the Reservation, ending at mouth (Pacific)	High during freshets—see our graphs, above. ACOE-CWA 106 data to date, monitored	Still OK for salmonids, due to size; some high periods in summer, believed natural by ACOE— CWA 106 data to date, monitored	Res--unknown, assume possible pesticide or nitrates but not at excessive levels due to river size, flow rate, and dilution	1. Reservation groundwater (well studies from IHS showed Mn) 2. upstream landowners—based on watershed analyses (peer studies)	1. Reservation-- address any unauthorized solid waste disposal (we transfer to Clallam County dump) 2. work with upstream landowners on forest practices or small farm activities, 3. remove more knotweed in U&A 4. dredge river with Army Corps (get 319 funds to extend scope?)
Waterbody	Sediment	Temperature, DO, pH	Chemicals	Sources	Assessment— <i>Good-all 3 below.</i> Remedies
Smith Slough, 0.5 miles long, entering Quillayute about 1.0 mi. from mouth, flows N-S	Not issue, except freshets originates on Res, flows about 0.5 mile before confluence (monitor CWA 106 data)	Not issue based on CWA 106 data (CWA 106 monitor data)	Assume none as starts on wilderness part of reservation	Assume runoff from land especially after freshets (CWA 106 data)	Knotweed recently removed from banks and new growth needs time to mature. Good status for now.
Lonesome Creek, orig. on Res. about 0.5 mi long, flows E-W (roughly) to Pacific	Not an issue as starts in Park and flows short distance to Pacific (monitor CWA 106 data)	Still acceptable for salmonids, used for hatchery— (monitor CWA 106)	Unlikely—not testing for it, though	Assume some runoff after freshets	N/A—banks planted up. Good status for now.
Small wetland perhaps 1/2 mile long and 200 ft wide, parallel to state HWY 110 and resort.	Assume not an issue except possibly from adjacent road after storms	very shallow, , but not fish-bearing or connected to fish-bearing water— not testing these	Assume possible from human activity nearby but not testing them. Heavy underbrush throughout	Assume only sources would be unlawful dump by someone. Not seeing this; not testing for it.	Continued outreach not to dump here. Not connected directly to a stream to get sediments. Only link is groundwater. Good status for now.

Reservation Waterbody	Stream Miles	Pollution	Source	Severity
<p><i>Quillayute River</i></p> <p>Monitor through CWA 106</p> <p><i>Condition still good only because of width of waterbody and rapidity of flow that clears it. Also tides do some clearing. Fair after storms. ACOE must dredge to keep it navigable in fact</i></p>	5.5	<p>Sedimentation-- from upstream rivers—data from CWA 106 and watershed analyses about tributary sediment, roads, and mass wasting. Dredging records of doing 10 feet or so every year.</p> <p>DO, pH, T still ok (CWA 106 data).</p> <p>Sediment so bad that marina is only 5-6 feet deep one year after dredging to 15 feet. This is changing the ecology of the river mouth/estuary. But because of river size, it is not 303(d) yet.</p>	<p>Silviculture/ roads in U&A, knotweed destabilizing banks</p> <p>Mass Wasting in highlands of U&A</p>	<p>Severe after freshets, shallowing is attributed by tribe to upland sediment influx</p> <p>Moderate</p> <p>Mass wasting is a rare factor, seen unrelated to weather. Usually runoff from storms.</p>
<p><i>Smith Slough</i></p> <p>Monitor- CWA 106</p> <p><i>Condition good</i></p>	0.5	<p>Starts and ends wild. Some turbidity after freshets. DO, T, and pH still ok.(CWA 106 data)</p>	n/a	n/a
<p><i>Lonesome Creek</i></p> <p>Monitor-CWA 106</p> <p><i>Condition good</i></p>	0.5	<p>Turbidity—some after freshets (CWA 106 data)</p> <p>DO, pH, and temp still acceptable levels (CWA 106 data)</p>	<p>Natural from banks.</p> <p>No issues</p> <p>No issues</p>	<p>Minimal</p> <p>no issues</p> <p>no issues</p>
<p><i>Wetlands</i></p> <p>Not Monitored</p> <p><i>Best judgment they are still good</i></p>	3 Acres	<p>Possible organics and dirt from adjacent State 110—not measuring here</p>	<p>Runoff—not measuring here</p>	<p>Minimal--based on visual observation only</p>
<p><i>Pacific Coast,</i></p> <p>Monitor: Surfriders</p> <p><i>Condition good, attribute to high energy and exchange of water constantly</i></p>	1 mile	<p>Fecal coliform, monitored by Surfriders. On rare times higher than safe for swimmers.</p>	<p>Uncertain. Bathers? Surfers? Marine mammals?</p>	<p>Infrequent issue and assume very rapidly dispersed by wave action and currents.</p>

7.4 Water Quality Studies Off-reservation, re NPSP

The Tribe's Reservation is impacted by upstream activities under state jurisdiction (government land and private landowners) and federal control (the Park and the Forest Service). The above-mentioned 1974 Boldt decision--*US v Washington*, 384 F. Supp. 312 (W.D. Wash. 1974)-- is a major premise for tribal co-management of water quality and fish habitat (along with the treaties it interprets), but nothing replaces the careful sowing of harmonious relationships, developed during processes such as watershed analysis, Timber-Fish-Wildlife meetings, salmon habitat Lead Entities, Watershed Planning, and joint restoration projects. The Tribe also participates in local meetings with County and City of Forks officials to create a positive presence in the area. There are individual riparian landowners who dredge gravel from river beds or install riprap by permit. The Tribe works with the applicable agency and the landowner when these cases come up to preserve fish habitat.

Since this Tribe has such a small reservation, with no forests or grazing land, and since it is not near a municipality, it depends on competitive grant processes, non-competitive funding, and BIA or NOAA appropriations for watershed management.

Federal, state and tribal projects to control nonpoint source pollution.

- 1. The tribe has a Timber Fish Wildlife biologist who works with one or more technicians to identify forest practices and hydraulic permits that can impact treaty waters and fishery.** He reviews the forest practice and hydraulic permit applications, which are provided by the WDNR and WDFW, respectively. He provides commentary from the Quileute perspective on how such activities can impact our water quality. He also participates in the agency/landowner ID teams to identify problems before applications are even made. He also attends state and tribal committees on these issues to stay up to date on problems, regulations, and such. It is his job to be on top of all these regulations. He builds relationships with landowners so that they come to him with issues before problems arise. He participates in compliance review (e.g., road built in forest lands has wrong grade gravel and impacts streams adversely—too many fines). His lead technician is a biologist who also is our GIS person. We have under other programs mapped all the streams that are fish-bearing and shared data with the state agencies and timber companies. The data are now uploaded into their GIS layers.
These TFW persons are also the crew that implement field operations like mapping and removal of knotweed in the Usual and Accustomed Area; and other field work/grant projects.
- 2. The tribe provides Army Corps of Engineers with data on the timing of the 10 fish runs that use the river mouth, for timing the dredging of the estuary (Reservation). This is the only area where work is entirely on the reservation, but sediment comes from upstream of it.**

- 3. The Tribe participates in a number of partnerships to implement assessments and field projects related to habitat restoration. See below. Knotweed is in #22-28. These are all in the Usual and Accustomed Area . All have to be done with partnering and permission of landowners, which permission is obtained in writing. We have a form for this. But WDNR gives us their own permit.**

The Tribe's projects are so numerous that we are mentioning these by watershed (cross-reference with the watershed/U&A maps. *Relationship to water quality is in italics within the paragraphs.*

1. In 1982 Leonard M. Nelson of the USGS issued a report entitled **“Streamflow and Sediment Transport in the Quillayute River Basin, Washington.”** This document was prepared in cooperation with the Quileute Tribe and the Army Corps of Engineers (Seattle District). Data was collected from the Dickey, Sol Duc, Bogachiel and Calawah systems, as well as the Quillayute mainstem. Figure 2 shows the River profiles. The author studied *precipitation figures* and gauging and crest stations in order to report on streamflow. Only the higher elevations of the Sol Duc and Calawah systems are impacted by snow accumulation and melting. Flood discharges for 10, 50, and 100-year intervals were reported. *The most significant topic for the purposes of this Assessment is that of “Suspended-Sediment Transport” found at p. 17.* For two years data on discharge of suspended sediment were collected and/or estimated, and tied to periods of high flows. The writer noted that for the most part rivers were clear, but during 5% of high flows, most of the discharge of sediment occurred. Data are reported in Tables 6-7 and Figures 7-11. In the event that the Tribe is able to get new monitoring data at the same points and for the same time intervals, there will be a means of clear comparison of prior conditions with current ones.
2. In 1982 Rayonier, Inc. through its Research Center in Shelton Washington, conducted a study **“Effects of Current Logging Practices on Fish Habitat in Five Western Washington Streams.”** This was presented at the American Institute of Fishery symposium on old growth forests and fish and wildlife, in Juneau, AK. Five Olympic Peninsula streams were studied; among them, Skunk Creek and Coal Creek of the Dickey drainage.

The team (Carl E. Samuelson, Ethelwyn G. Hoffman, and Stanley H. Olsen) studied fish presence; stream lengths, gradients, levels, *sediment (gravel presence)*; temperatures, chemical parameters (DO, pH, conductivity, optical density, and turbidity); and presence or absence of benthic riffle fauna. The authors concluded (for the study areas) that logging and roads did not adversely impact fish populations or benthic invertebrate composition (taxa represented). There were increased numbers of benthic invertebrates after logging. Riffle fines did not increase everywhere, but did increase in some places. Summer temperatures and absolute fluctuations increased after logging. Other water quality parameters such as DO remained above accepted minimum levels.

The final quote is relevant: “*The potential for detrimental affects [sic] on stream habitat from improper road construction and logging has been well demonstrated in the literature.* This work indicates that current logging practices, properly designed, conducted and supervised within existing environmental constraints are compatible with fisheries production in small western Washington streams. “

3. In 1984 the USGS (Water Resources Investigations Report 83-4162) published a report, “**Quality of Water, Quillayute River Basin, Washington**”, authored by M. O. Fretwell. Recognizing the importance of the River and its tributaries to Quileute fisheries, the agency documented for three years the distribution of streamflow, *discharge of sediment*, and relationship of these to fish spawning capacity. It also studied water quality characteristics and designed a water-quality and sediment network and a streamflow network to indicate significant changes in water quality or streamflow that might affect the tribe’s fisheries resources.

Data were collected during the summers of 1976 and 1977. Two samplings were made in the river system at 53 sites and four in the estuary at 14 sites. Additionally the data were compared to prior collections from the Sol Duc, four lakes in the system, and nine wells in the system. Since a watershed analysis of the Quillayute mainstem has not been done, it is significant to look at information on this River, especially the estuary, as it is closest to the Reservation. However, the data and studies are some 20 years old.

It is significant to note that the Quillayute is probably cooled by entry of the tidal salt wedge as much as by inflowing freshwater. Nutrient concentrations during the test period were low and fecal coliform below state limits. Some seaward sites exhibited low DO but this was attributed to a high level of organic bottom materials.

4. In 1990-1991, Phillip Decillis of the Quileute Natural Resources Timber/Fish/Wildlife Program (now of USDA FS) led the study: “**Physical Stream Survey of the Quillayute System.**” This is a study of (a) the Quillayute River from its confluence with the Sole Duck and Bogachiel Rivers (“Three Rivers”) to its mouth; (b) the Dickey River and its tributaries downstream from the confluence of the East and West forks; (c) the Bogachiel River; (d) the Bogachiel’s main tributary—the Calawah, from the confluence of the North and South Forks to its confluence with the Bogachiel; and (e) the Sol Duc River, between its confluence with the Bogachiel at Three Rivers and the Hwy 101 bridge N of Forks at mile 18.2. The Dickey joins the Quillayute one mile from its mouth. (See topographic map of Olympic Peninsula, attached in appendix.) The Dickey System itself is an excellent source of Chinook, coho, steelhead, and sockeye—all anadromous salmonids. The Quillayute is their doorway to and from the Pacific. Overall, some 12 miles of stream segments were studied of the Dickey and Quillayute. Approximately 16 miles of the Bogachiel and 10.5 of the Calawah were studied. The lower 12.6 river miles of the Sol Duc were studied.

- All of the study areas are identified by WRIA segment, their Township, Range, and Section, and/or their given name.
 - The study notes (segment by segment) the channel length, width, depth, pools and riffles and their ratios, *grain sizes (cobble, gravel, sand, silt, and ratio of these)*, gradient, shade and cover, presence of lakes, land use, other water uses, spawning area, rearing area, salmonid species use by river mile, limiting factors to salmon production, and the causes for these when known.
 - More than two hundred hard-copy pages of data are bound in a notebook.
5. *Baseline monitoring.* The USEPA GAP program funded baseline monitoring from 1991-1995 and results led to listing of several waterbodies on the State's CWA 303(d) impaired waters list. This was in the Usual and Accustomed Fishing Areas--*In 2000-2001 the Army Corps of Engineers monitored for inorganic water quality criteria in the Quillayute River, on --reservation, for its updating of its 1980s EIS. It produced a supplemental EIS. The same water quality expert that worked for the Corps trained our tribal technicians to monitor water quality in the same area, for two more years (2002-2003), under IGAP. We also purchased a Datasonde and Surveyor under GAP, which we are using now (former Hydrolab, now Hach) under CWA 106 Tier One (FYs 2008-2009).*
6. *Sol Duc Pilot Watershed Analysis.* The BIA funded (1994-1995) the Tribe's participation in this pilot study under the President's Forest Plan. The Tribe worked with the USDA Forest Service, with which it developed an MOU, Olympic National Park, the State of Washington (Ecology, Fish and Wildlife, and Natural Resources), and Rayonier Timberlands Operating Company. This was the beginning of several cooperative projects with these parties. This was the first tribal watershed analysis grant of its kind—the pilot. It did not have a water quality component; that was not added to the process until 1997. It did have fish habitat and vegetation components. *It also had a sedimentation module.*
- Report modules include *Hydrology, Channel, Water Quality, Riparian, Vegetation, Wildlife, Public Works, and Cultural.* This was a combined TFW/federal analysis. Water Quality and Cultural were voluntary at this time period.
 - Causal Mechanism Reports are included, as well as Restoration recommendations. Maps and Data are in the appendices.
 - This watershed analysis was published in 1996 and prescriptions (recommendations for further work—monitoring to fill data gaps, recommendations for restoration, or recommendations for forest practice changes) were developed by a team of experts derived from the watershed analysis.
7. *Sol Duc Restoration.* The BIA (competitive grants, President's Forest Plan) has funded restoration (1998) of channel diversity in Bear Creek and blowdown repairs and bank reconstruction in Gunderson Creek, as well as culvert replacement at an unnamed wetland and at Powell Springs. The Powell Springs project was conducted jointly with Rayonier and Washington's DNR. *These projects help to reduce sedimentation.*

The USEPA and the USDA FS worked with the Tribe to restore channels of Shuwah Creek (1997) and to replace a blocked culvert of Bockette Creek in the Sol Duc River Basin. Channels where diversity was restored have been surveyed for fish presence, and show marked improvement. *The ponding and increased depth have improved temperature and redirected sedimentation.* Where blocked culverts were replaced with larger ones, fish have returned to spawn in areas long unused.

8,9. *Sol Duc Monitoring.* Washington's Department of Ecology funded a two-year competitive grant project to monitor where watershed analysis showed data gaps. (1997-1998) The Tribe leveraged this grant with a two-year biocriteria pilot funded by USEPA to determine if timber harvests adversely impact species of macroinvertebrates that are indicators of clean water. Because the biota in this area are apparently low in numbers, compared to areas farther south, the macroinvertebrate data were inconclusive.

The main concerns were increased water temperature, blowdowns of riparian trees, reduction of dissolved oxygen, loss of refugia as streams flatten out, and sedimentation that enters the system from removal of vegetation and timber cover. The sediment, besides smothering salmon eggs or irritating gills, also reduces stream depth, aggravating DO and T issues. Only one very small cattle farm and a few towns of 300 or less are located in the system.

10. *Watershed Analysis.* In 1996-97, tribal biologists and a contract anthropologist from University of British Columbia (specializing in Quileute—Dr. Jay Powell) participated in a watershed analysis/assessment of and development of prescriptions for the **North Fork of the Calawah**, with the USDA FS and Rayonier Timber, the two principal landowners. .

- This drainage is in the Tribe's U&A. Discussion modules prepared include: Hydrology, Sedimentation, Riparian, Vegetation, Fish, Wildlife, Public Works, and Cultural. Maps and Data are in the Appendices.
- The Team also prepared a Causal Mechanism report describing *hazards for mass wasting, surface erosion, hydrology, large woody debris, and shade.* The prescriptions for water quality (not a module of this analysis) are voluntary because that module was not a required part of the watershed analysis process at the time the analysis was conducted.
- *Mass wasting is a concern in this watershed because of so many steep slopes, which can lead to debris flows and other mass wasting of serious proportions. Chronic surface erosion often follows such landslides and after-cast burning. Strict requirements for road construction and maintenance (including culverts), and for harvests in unstable areas, were adopted.*
- Prior forest practices have left certain riparian zones vulnerable to erosion, with insufficient LWD available for channel diversity or shade protection. No-cut buffers, thinning, and retention of a certain number of trees per acre are among the proposed

remedies, none of which is immediate in terms of correcting damage. However, the parties are building for the future.

11. *Watershed Analysis*. In 1998-1999 the Tribe participated in the **E/W Dickey Watershed Analysis**, meaning that the mainstem was not part of the study (because of the extensive acreage already involved). Participants included tribal biologists, Dr. Powell as a contract anthropologist to the Tribe; Rayonier Timberlands Operating Company, Washington's DNR and DFW, and Washington Environmental Council (coalition of non-profit environmental groups). No federal land was involved. *The role of its extensive wetlands (some 10% of the watershed) was an important consideration. Both the Tribe and Rayonier enlisted the services of outside experts. The Dickey wetlands are important rearing habitats and sediment filters. Research indicated that wetlands and groundwater play important roles in regulating stream temperature, too, so that cover removal has an adverse impact even when not adjacent to a stream. The main concerns were increased water temperature, blowdowns of riparian trees, increased sedimentation, loss of DO, loss of refugia as streams flatten out, and loss of wetlands. Timber harvest is the sole industry in this system. There are some rural homesteads. Olympic National Park is at the mouth.*
 - This drainage is in the Tribe's U&A. Report modules include a Synthesis of the Issues, Causal Mechanism summaries, Water Quality, Stream Channel, Fish Habitat, Riparian, and Public Works. A voluntary Cultural Module was conducted—use of Dr. Powell was again arranged. This was the pilot for Water Quality, statewide. State watershed modules do not include Wildlife or Vegetation. No Hydrology module was conducted because in WA this is a rain-on-snow study, and for the Dickey, this is irrelevant (low-lying).
 - A prescription team followed watershed analysis and developed recommendations for forest practices and restoration.
 - For the Dickey, temperature of the water is a hazard for salmon in some segments: it is high, largely due to past forest practices that removed cover. Shade is indicated as a hazard, as is large woody debris that would enhance ponding and refugia.
 - The drainage has a high number of roads and surface erosion is also noted as a hazard.
 - The tribe's biologist conducted independent research on transfer of heat from poorly shaded wetlands to groundwater to the streams. This concept is accepted in many academic circles but not necessarily within Washington forest practices. The issue of the depth to which groundwater temperature is affected is not resolved.
 - Prescriptions involve road construction, wetlands protection, and riparian buffers. During watershed analysis, considerable time was spent studying wind throw—types of trees that were most resistant, prevailing winds in storms of this area, etc. Creative buffer design will be the challenge landowners face out here.

12,13. *Dickey Restoration*. The BIA (competitive grants, President's Forest Plan) has funded (1998) the Tribe's cooperation with Rayonier and WDNR to replace a bad culvert with a bridge, and more recently, with Rayonier, to install cross-drains in numerous key locations. Cross-drains are specialized culverts that direct road-derived sedimentation away from ditches where they would enter streams and back onto the forest floor. Rayonier has initiated extensive road surveys to select the best locations for cross-drains. It has held training courses for the Quileute Natural Resources staff, including field work. We also did conifer enhancement (removal of alders) in one fork of the Dickey. *The long-term effect of this is improved shade, so improved water temperature and DO*. The Tribe is proud of its cordial relations with this major landowner.

14. *Watershed Analysis. Sitkum/South Fork of the Calawah*. The BIA (competitive grants, President's Forest Plan) funded tribal participation with the USDA Forest Service on this watershed analysis, conducted in 1998. This proposal was ranked #1 in the 1998 competition among northwest tribes. Extensive mass wasting led to blocked streams, road closures, and serious access issues. The tribe spent several months hiking the uplands testing for fish presence to determine what streams should be targeted for restoration, in light of reduction of USDA funds overall.

- This drainage is in the Tribe's U&A. Discussion modules prepared include: *Hydrology, Channel, Sedimentation, Fish Habitat, Riparian, Species and Habitat, Vegetation, Wildlife, Public Works, and Cultural*. Maps and Data are in the Appendices. The Tribe again contracted with Dr. Powell for cultural analysis.
- A Guidance Chapter (prescriptions equivalent) on Restoration is included. The Quileute participation was in two areas, Cultural and Fish. This watershed analysis was prioritized by USDA because of *significant mass wasting that blocked roads and streams and caused access issues, not only for migrating fish but also for USDA FS personnel and recreational users*. The Tribe spent months in the backwoods stream-typing for fish presence and detecting pockets of cutthroat trout and other salmonids. Their presence will aid the USDA FS in making judgments about harvest and prioritizing restoration or road decommissioning.

15. *Wetlands Inventory*. The EPA funded a two-year study (FY 1997-1999) to inventory wetlands and plan their protection. The funding was so limited that the Tribe had to triage efforts within the ceded lands and dovetail them with mapping of Dickey wetlands under that watershed analysis. We did some GIS mapping of the locations. Since all the wetlands except for one small one on the Reservation are on state lands or Olympic National Park, the protection plan for those must be that of the Department of Ecology or ONP. The strip of reservation wetland lies between the resort and Highway 110 and may be anthropogenic, accordingly. The Tribe understands it must not fill or dredge in a way that impacts this strip.

16. *MOU with Olympic Natural Resource Center of the University of Washington*. The Quileute Tribe is the first tribe in Washington, and so far, the only one, to enter into this relationship

with the University. The two parties advise each other of research activities in the tribe's treaty lands. The Tribe participates in joint programs involving monitoring of harmful algal blooms along the coast. The Tribe's Natural Resources Director sits on the Scientific Advisory Committee of the ONRC as its sole tribal representative in the State. This relationship has led to other recognition, including an invitation by the Pacific Northwest Research Station of the USDA FS, in Olympia, to include a Quileute Natural Resources person in review of research grants funded by the USDA FS and UW.

17. *Advisory role in monitoring of Mill Creek, Forks, WA. The Tribe has provided advice on monitoring of physical, chemical, and biological criteria in this tributary of the Bogachiel, which runs through Forks. The project was initiated by the Quillayute Valley School District (Forks), with the ONRC.*
18. *In 1998 KCM completed its update/wastewater engineering report for the Quileute Reservation. No reservation actions create NPSP.*
19. *In 2000 the Tribe met with Dr. Carol Smith of WA Conservation Cmn. and other stakeholders to compile and complete the Limiting Factors Analysis for WRIA 20. It had a major water quality component, drawing on the watershed analyses and other material. Because the watershed analyses were included in her work, the summary of tributary sediment and water conditions in the charts below comes entirely from the WCC project, which was more inclusive, and not from the watershed analyses, individually.*
20. Survey of Bogachiel nonpoint source pollution from roads and of blocked fish passages (BIA funding. In-kind assistance from Rayonier. (2001-2002)
21. In 2004, WRIA 20 completed its Phase II Technical Assessment of the Sol Duc-Hoh Watershed (WRIA 20). *It has a major water quality component.*
22. Eradication of Japanese and Himalayan and giant knotweed canes from the stream banks of the Dickey (2003-2004) with BIA funding, cooperation (access) by state and private landowners, and both financial and personnel partnership with Clallam County Noxious Weed Control Board. *Knotweed aggressively replaces the native riparian vegetation that provides shade and secures stream banks, so this project benefited water quality. The Tribe also removed knotweed from the Quillayute River within its reservation, and removed terrestrial stands. While knotweed does very well in aquatic situations, it also thrives in terrestrial habitat—came in as a decorative garden plant from Asia. Quillayute River work was in partnership with Olympic National Park.*
23. In 2005-2006 Quileute used BIA funds to *assess salmon habitat restoration needs* in the Quillayute Basin, and to get the complete buy-in for future project cooperation, we engaged the local timber companies, WDFW, Ecology, WDNR, USDA FS, and county in discussions from the onset. We used a neutral contractor (retired WDFW biologist with MS degree) to do

24. In 2005-6 Quileute also eradicated remaining knotweed in the Dickey River with federal funding from BIA. *(Bank stabilization)*
25. In 2006-7 the Tribe surveyed and GIS mapped assessed presence of Knotweed in the Sol Duc, Calawah and Bogachiel Rivers. *(Bank stabilization)*
26. In 2007 the Tribe with Clallam County eradicated Knotweed in the Sol Duc River Basin. *(Bank stabilization)*
27. In 2007-8 the Tribe engaged a contractor to upgrade its marina and the *existing creosote pilings were removed. (remove toxin risk)*
28. In 2008-9 the Quileute Tribe eradicated/will eradicate knotweed in the Calawah River and with any funds left over work on the Bogachiel River, into which the Calawah flows. This is with the last BIA watershed grant. That program is now ended for all tribes. *(Bank stabilization)*

From the above descriptions, the EPA may note that this Tribe, while a small landowner itself, has a history of strong relationships with adjacent landowners and well-presented grant proposals. We are handicapped by a small staff and limited funds for habitat protection or preservation, all of which come from soft money. However, in spite of the circumstances, we have developed a reputation in the area for competence and reliability.

7.5 Tabular results of above studies

This Tribe has participated in so many intensive watershed studies of four major river systems of the Quillayute, that creating summary tables for each tributary is virtually impossible. We can include summary studies from the watershed analyses in the Appendix, so that the EPA can see the depth and detail. These summaries are 20-30 pages, and already condensed for federal or state reports. They really cannot be condensed any further. However, short summaries of the watersheds follow:

Summary Table of Watersheds of Quillayute River System (next 2 pages)

Watershed	Road Sediment	Mass Wasting	Other	Other Comments
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			Impairment	
Dickey—East, West and Middle Forks—subject of watershed analysis with WA, tribe, Rayonier “Watershed Analysis” is abbreviated as WSA.	High incidence based on watershed analysis by WDNR and Rayonier, but some is natural to system. Blocked culverts. Some restoration has occurred to resolve these issues.	Minimal, along certain channel banks, based on WSA	WSA: Low dissolved oxygen, and Temperature increases attrib. to lack of LWD recruitment, harvest of wetlands, sediment filling channels	Lowland watershed. Still excellent fish producer of several salmonid species, including lake sockeye—based on Quileute spawning surveys each year.
Dickey Mainstem (not studied by WSA)	Because timber harvests heavily in mainstem basin, road issues are likely here but not studied in WSA.	Not studied by WSA but likely similar to E-W Forks.	Japanese and Himalayan knotweed were heavy in the mainstem banks but Quileute removed these with BIA funds in 2004-2005.	Subject to tidal influence near mouth. Low-energy, slow part of river, so any addition of nutrients, pesticides, heat, will have increased impact
Sol Duc—watershed analysis with feds, WA State, tribe, Rayonier “DO” means “dissolved oxygen” “WSA” means “watershed analysis”	Road sediment a factor from timber access roads—WSA.	Some mass wasting where blowdowns, and where steep slopes--WSA	Some DO issues and temp issues (303(d) list) in some tributaries bec. of harvest; public works issues—ROW for electricity, bridges w/blockages; WSA “hazard calls” for hydrology, sedimentation, channel, and riparian (shade)	Starts high in Olympics, very long system (see maps), still highly productive (fish)—tribal spawner surveys; most human impact on this watershed—possible runoff from Lake Creek Transfer Station, trailer parks in Beaver

Table continued on next page

Watershed	Road Sediment	Mass Wasting	Other Impairment	Other Comments
North Fork of Calawah—watershed analysis with feds, tribe, Rayonier “T” means temperature “LWD” means “large woody debris” WSA—watershed analysis	Roads are not the main problem in this watershed	Big issue here because of steep topography and prior harvests (1920s and 1940s)	T is good, since much of stream goes underground. Harvest has removed LWD recruitment.; WSA “hazard calls” for hydrology, surface erosion, mass wasting, riparian (shade), and LWD recruitment	Starts high in the Olympics—good fish production
Sitkum and S. Fork of Calawah— watershed analysis by USDA with Tribe (WSA)	WSA: Mostly nat. park and USFS— roads not serious issue.	WSA: Very steep slopes cause serious mass wasting, blocking streams and roads. Cascade falls, logs, debris— natural blockages	WSA: Not serious issue, but fish blockages and lost habitat can be. Also, mistyping of high-altitude streams. Recommendations after WSA include sediment reduction through adaptive management forestry practices and planting of slide areas, and culvert replacem’t.	Starts high in the Olympics—good fish production— tribal spawner surveys confirm. Major stream typing program after last mass wasting events—demo’d fish presence (trout)
Mainstem Calawah—1990 study--QNR	logging roads—led to siltation of spawning gravels	inadequate stream bank covers noted	Some ammonia— appears to derive from algae—see next column for potential sources of fecal material and waste petrol.	Flows into Bogachiel. Possible storm runoff from Forks and “suburban” industrial park
Bogachiel—1990 study of mainstem (QNR); Inventory planned.	logging roads and old culverts here can be issues. Lower terrain than Calawah.	Gravel removal causes mass wasting and disturbs redds— Quileute fisheries.	Landowner rip-rapping of banks, other alterations; some ammonia from Forks or hatchery— below dangerous levels for fish	Small farms a concern—no riparian protection. Still good fish presence.—spawner surveys Calawah flows into Bogachiel...
Quillayute Mainstem—not studied in watershed analysis—only part that runs through Reservation.	Recent bridge change at Three Rivers may lead to log jams because of center support	Not major issue	Subject to tidal influence	Homeowners build right up to shoreline. Mostly undeveloped. Fish access to Pacific. <i>Problems from Bogachiel, Calawah, Sol Duc, and Dickey flow into the Quillayute</i>

Poll

utants not discussed: Because we do not have agriculture and the timber operators use biodegradable materials for pesticides it is presumed that nitrogen, phosphate, pesticide, toxics,

or fecal coliform do not have a major impact the Quillayute watershed to the point where it is impaired, with extremely few exceptions, which would be noted under the 303(d) list attached. The absence of farms and communities is the reason for our good fortune regarding those pollutants. There is no water withdrawal problem, *yet*, in the Quillayute watershed, for the same reason. Quileute only tests the reservation waters at this point, for temperature, dissolved oxygen, turbidity, and pH, per Tier One of CWA 106. Next FY we are adding salinity.

Water quantity: The historical practice of the Washington Department of Ecology has been to grant water rights to all who apply, with the caution statement that the rights of the applicant may already be superseded by an earlier application. This is in lieu of doing homework regarding prior designations and has led to over-commitment of withdrawal rights throughout the state. The Quillayute System is no exception. In 2007 the Tribe secured a letter from Jay Manning, Director of Ecology, promising to use good data to set Instream Flow Rules, rather than “quick and dirty” module work, funds permitting. Under the WRIA 20 Plan, instream flow rules were to be set by grants from Ecology during the Implementation Phase. The state has currently put a freeze on such funding.

There have been so many intensive studies of the Quillayute System, that a brief summary of each is relevant. These studies are so detailed (part of research papers by federal agencies or part of multi-party TFW or federal watershed analyses) that using the format suggested in the CWA 319 seminar is not feasible—the data cannot be digested in that manner. That is why portions are attached. However, a paragraph or two will describe the type of studies conducted, by whom, when, and kinds of data gathered.

7.6 Legislative Impacts

1. **Habitat Conservation Plans.** The Washington Department of Natural Resources has exercised its right under the Endangered Species Act to develop a Habitat Conservation Plan for 50 years. This has been approved by NMFS and fixes the obligations with respect to forest practices, under the “no surprises” policy. Tribes are dissatisfied with the funding aspects of this plan, in particular with funding for roads, as the DNR is already behind and no provision is made for future repairs. The Tribes are also dissatisfied with the lack of ongoing monitoring provisions or opportunities to address newly endangered or threatened species. For Quileute, the biggest immediate concern will be road repair (sedimentation). Private lands in 2007 also completed their HCP under the umbrella of the DNR.
2. **Water Quantity.** The Washington Department of Ecology has been continuously assigning water rights with warnings that they may already be assigned to others—“buyer beware.” These assignments do not even contemplate prior tribal rights to water, both aboriginal and the *Winters* rights to assure fish habitat downstream from a water “take.” Water quantity for fish is undergoing a Renaissance since the listing of three species on the Olympic Peninsula. Only one of these fish is in the Quileute U&A and that is not in the Quillayute River System—it is in the Lake Ozette Drainage. Still, policy changes as a result of these listings

may long-range protect the Quillayute System, which because of minimal development by developers, industry, or agriculture, has not yet seen a major drawdown. Timber does not draw down on water.

3. **Instream Flow Rules:** To date there are none in the Quillayute and the Department of Ecology has cut funding under its RCW 90.82 Watershed Planning for field projects that will fund this type of study, so rules can be set, because of the current economic situation.
4. **Forest and Fish Report.** This “Timber Fish Wildlife Agreement (1986)” stepchild of 1999 (some tribes and all environmental groups withdrew from the process) has been endorsed by state and federal government entities and by certain tribes. Other tribes have withheld final judgment and are watching. This essentially created a giant Habitat Conservation Plan for all private timber landowners in Washington. After its creation the Department of Natural Resources enacted regulations (2001 et seq.). Since then the state has actually received Habitat Conservation Plans for state lands and private lands under Section 10 of the ESA. These have requirements for effectiveness monitoring but economic situations have greatly cut the ability to implement projects.

FFR ostensibly relied on reports from a number of sources, federal, state, tribal, and private. It is perceived by tribes and environmentalists as very weak on riparian protection, especially with respect to buffers. Funding is unclear for projects that are endorsed, such as are funds for roads and for adaptive management. Also, in that latter category (AM), a monitoring approval committee does not have to include tribal input or give credence to alternative monitoring programs.

For the Quileute, adequate thinning to produce good LWD for the future, and adequate buffers in a high-risk blowdown area, are critical. We cannot rely on this state policy/law to protect fish and must negotiate with landowners for voluntary forest practices where needed.

Quileute has two biologists that review state forest practices for compliance, both on ID teams and by review of HPA and FPA applications for instream work and forest practices, respectively (compliance). They also participate in state and tribal meetings to remain updated.

8.0 Best Management Practices

8.1 BMPs for Government Process, at Quileute.

1. Responsibility for monitoring and control (via grant funding) of NPSP lies within the Quileute Natural Resources Department (QNR) of the Quileute Tribe, which employs biologists, GIS technicians, field technicians, water quality personnel, and an in-house attorney/grant writer. (The present staff attorney is also a geologist with two degrees and

10 years in that field.) Presumably the department will endeavor to keep this same skill set despite potential turnover because of its co-management duties.

2. Staff of QNR attend public meetings and seminars to be aware of issues, methods, and regulations regarding NPSP. These include interagency committees like the lead entities and watershed planning groups; Northwest Indian Fisheries Commission committees on water quality and forestry; knotweed eradication working groups, regular meetings with forestry personnel in WDNR, timber companies, and USFS; interagency meetings with USCG or Army COE; BIA forestry meetings, and a host of similar activities too lengthy to name here. They provide tribal input and receive knowledge from other parties.
3. Staff of QNR also read policy, regulations, law, etc. from all federal and state agencies and local governments that have jurisdiction in the tribe's treaty area (some 20 entities).
4. Staff of QNR attend commercial and government-offered seminars to remain informed of issues related to water quality and fishable rivers, and timber practices or land development that could impact waters the tribe either co-manages in its U&A or manages inside its reservation.
5. The Tribe does not have its own water quality standards, being a one-square-mile reservation at the mouth of a river and so impacted by upstream activities. We rely on state standards and EPA water quality certification for activities in the reservation like Army Corps of Engineer dredging. The USCG has a station here and enforces oil spills in the marina.
6. The Tribe relies on EPA funding to test for water quality in the Quillayute River, and in Lonesome Creek under CWA 106 grants.
7. When the staff discerns an issue in the U&A or on reservation that can be improved by grant funding, and a grant is available, it applies for this grant. Because we are surrounded by other entities, in almost every case the project involves partnering, so we engage in talks with the neighbor entities to establish how duties and costs may be divided in the grant.
8. Quileute has an elected body of natural resources policy persons (7) who advise the staff on policy issues of the tribe and who give approval of grant programs proposed when policy issues exist. When the grants are purely technical and there are no policy issues, we generally go directly to tribal council with approval.
9. When a larger program requires public meetings (such as Treatment as a State, or introduction to the tribe of a major agency action such as the Olympic Coast National Marine Sanctuary Management Plan EIS), the staff schedules, posts notices, and facilitates the public meeting.

10. The Quileute Tribal Council (5 elected officials) has final approval of grant programs before they are sent off.
11. The Tribe works with grant administrators within granting agencies to assure grant performance is moving along smoothly, through regular reporting, and ongoing communication related to issues that may arise.
12. The QNR staff hires contractors as needed for areas of expertise (e.g., culvert installation or dredging) but otherwise either trains personnel, or uses trained personnel to implement on the ground projects. We use bidding to hire contractors, unless there is a sole provider or unique expert situation. The staff has oversight for grant implementation.
13. The tribal administration administers financial aspects of any grant funding according to federal specifications. (Protocol attached in the Appendix CD).

8.2 Existing Technical BMPs

BMP	Np source category	Subcategory
Channel Restoration	Hydrologic Modification	Dikes, bridges, culverts Riparian vegetation removal Knotweed removal Dredging estuary
Habitat Restoration LWD Riparian Vegetation	Habitat Modification	Vegetation removal Loss of pool/riffles
Wetland Restoration	Habitat Modification	Wetland fill
On-Site System Replacement	Construction	Land development (leaking septics)
Fencing	Agriculture	Animal management
Forest Practices/Forest & Fish	Silviculture	Harvest on slopes Harvest in riparian zones Road construction/maintenance
Critical Areas Ordinance & Policies	Construction	Land development Road development
Stormwater management Ordinances/facilities	Runoff	Impervious surfaces Flooding
On-site Systems M&O	Construction	Land development (septics)
Public Education	All of the above	All of the above

Note – Land acquisition is an overall BMP to rectify or prevent nonpoint pollution through control of land use where educational and regulatory processes are inadequate. The state Recreation and

Conservation Office funds such projects but the process is highly competitive. Quileute is also not in the business of land management so such choices must be considered carefully.

9.0 Nonpoint Source Control Programs

The Tribe's Water Quality Program within Quileute Natural Resources will take the lead in source control. Since most of the sources are off Tribal land, the Tribe will rely heavily on Clallam County's Critical Areas Ordinance, Shoreline Management Act (around Lake Pleasant), Septic System Operation and Maintenance Plan, its draft Stormwater Management Plan, and its implementation of Watershed Plans for WRIA 20 (state funding for last is on hold right now). The Tribe will also rely on City of Forks' operation of its Stormwater Plan.

The Tribe has been aggressively assessing and removing knotweed from its U&A and reservation through BIA watershed funds that are no longer available (entire program ended). It still has some work to do, in the Bogachiel subbasin of the Quillayute, based on assessments in prior years. We are continuously searching for funds to complete this work. We have all the equipment, are trained, and have licensed applicators. We just need to be able to pay crew and mobilize them to the sites.

The Tribe will also make maximum use of the opportunity to participate in Forest Practices through ID teams when Forest Practice Applications are noticed, and through review of Hydrologic Permit Applications when these are being processed. These go to our TFW Biologist as a matter of law. *See italics paragraph on page 43.*

The Tribe has completed an assessment of restoration projects in the Quillayute Basin in 2006 (see CD Appendix), which was adopted into the Strategy for North Pacific Coast Lead Entity (salmon restoration). We did this project with BIA funds and used input of and endorsement by all the state, federal, and private timber operators and fish agencies in the Quillayute Basin. It is a combined effort specifically to get their cooperation for grants. We are continually looking for funding to assist the landowners with implementation of these projects, which include culverts, road decommissioning, knotweed removal, and other types of stream restoration that will reduce nonpoint source pollution and improve stream efficacy for fish.

The Tribe (staff attorney of QNR) will also work with Lead Entity and Watershed Plan participants to write, endorse, partner, or otherwise further grants to improve water quality (RCW 77.85 and 90.82, respectively). She helps to write the strategies for restoration and reviews group documents.

Every year or two the Army Corps of Engineers dredges the Quillayute estuary to keep it truly navigable. It gains 10 feet or so of sediment between dredges and even blocks USCG ingress and egress. The ACOE only dredges a path for the USCG and Quileute must pay for extra work, which it rarely can manage. We would like to extend the scope of the dredging, with any funds possible, to truly open up the river mouth and maintain the natural ecology of the estuary, as well as make it a fishable river from the standpoint of our tribal fishing boats, sometimes actually trapped in the marina. We would get extension of the EPA Water Quality Certification and contract with the

ACOE dredge contractor for such program.

10.0 Conclusions

Key findings: The NPSP concern to the Quileute Tribe is sedimentation.

Detrimental sources: The sources are numerous and diffuse. Some causes are natural (steep slopes in upper reaches of the Quillayute Tributaries) and some are anthropogenic (timber harvest, road building, land clearing, cutting trees along the riparian zones—homeowners). In some cases, as in the Dickey, we see anthropogenic sedimentation shallowing an already shallow system, and this results in high temperatures and low DO. The cumulative impacts of these pollution categories that so negatively impact Tribal waters. The clear result is the shallowing and sediment loading of the Quillayute mainstem in the reservation.

Special concerns: Most sources occur off Tribal land. This is a special concern, because the Tribe has no jurisdiction on such lands, and must rely on cooperative working relationships with those entities that do. This factor will shape our NPS Management Program.

Discussion.

1. Highlight impaired waters.
2. Identify major nonpoint sources
3. Rank nonpoint sources based on quantifiable impairment
4. Describe relationship between NPS pollution and water quality parameters

1. These categories were established by EPA but to address them at this point would be redundant. There are no CWA §303A(d) listings for turbidity in the Quillayute River, but we have a channel so impaired that boats cannot get in and out of it without continual dredging by the Army Corps and our CWA 106 monitoring shows surges of turbidity after storms, from upstream runoff (the 4 river tributaries into the Quillayute) . The other reservation waterbodies originate in or near Olympic National Park and are not impacted.

2. The only significant sources of nonpoint source pollution to date are timber harvest and the roads constructed to facilitate that harvest.(This remark is based on the watershed analyses modules on sediment and roads, referenced above.) The harvest removes trees that help to retain soil and that create shade for the streams or for wetlands that feed into the streams. The largest trees are removed, so that large woody debris recruitment is impaired. This reduces the likelihood of channel diversity and ponding. Accordingly, we have the development of higher temperatures in the streams, a type of nonpoint source pollution as well. The construction of roads and the use of them thereafter increase the introduction of fine sediments into the streams.

3. We rank sediment load as the top concern, although it may be that if it continues unabated,

temperature increase and reduction of DO will also be impairments.

4. How NPSP affects water quality: Runoff shallows the streams, making them warmer and thereby decreasing dissolved oxygen. Fines even choke the fish eggs or irritate gills of fish beyond egg stage. In some cases algae increase in number and contribute to ammonia where blowdowns of buffer trees makes streams more exposed to sunlight. It is a matter of time before we have the 303(d) listings. Quileute has been unable to get funds to monitor in the U&A but with its proposed PPG just submitted, may be able to correct that issue. Timber is not monitoring for water quality so it is going to be up to us.

This having been said, we have a private timber company in the area that is highly responsible and working closely with the tribe on stream restoration and enhancement grants. It is conducting cutting-edge research on road surveys that indicate prime candidates for cross drains that redirect road sediment to the forest floors. We do not want to eradicate timber from this area—alternatives of real estate development or agriculture would be far worse for the fish and are far less regulated. So we believe the best recourse is discourse and cooperation, within the constraints of the Washington requirements. Other major landowners are the State of Washington (DNR forests) and the United States (USDA FS). Because we cannot predict the land ownership for the future, it is advisable to have requirements for nonpoint source pollution that would give the Quillayute at a minimum the water quality that it has at present, with three reasonably compliant land managers upstream, but no worse. We also would expect that corrective action be taken where streams are listed as impaired under CWA §303(d).

Potential Programs for Reduction of Nonpoint Source Pollution—we will underline the programs we hope to undertake under the proposed Management Plan.

1. Develop a viable recycling program on the Reservation. This has to emanate from the Tribal Utilities Department, and the 319 effort is being spearheaded by Natural Resources. We have an effective solid waste program already, picking up waste through Utilities staff and trucks, and transferring to Clallam County Waste Disposal.
2. Work with land managers on harvest, restoration, enhancement, and monitoring programs that protect water quality, as well as knotweed removal. Write grants for these processes; and attend intergovernmental meetings, seminars, and conferences. This is very likely programmatically from Natural Resources as we have been doing it all along. We have assessed for knotweed and now need funding to complete the removal in one major watershed that flows into the Quillayute.
3. Develop Treatment as a State for Section 319 of Clean Water Act—in Process under IGAP.
4. Prepare Nonpoint Source Pollution Management Plan—in Process under IGAP.
5. Develop Tribal Water Quality Standards with USEPA assistance (technical and financial)? This is unlikely because the reservation is one square mile in size and surrounded by entities using state standards, like Olympic National Park and Rayonier Inc. We will likely continue to operate under state standards with EPA oversight for tribal water quality.

6. Work with Army Corps of Engineers on river dredging issues. Ongoing through Natural Resources and likely to continue so long as federal funding does.
7. Work with USCG on oil spill control from vessels. Natural Resources can apprise its tribal fishermen to maintain boats. This is ongoing outreach.

Conclusions—Key Findings

1. Water quality monitoring of tribal groundwater has not been conducted for a number of years, since we pipe in drinking water from an aquifer 6 miles away. We monitor the reservation waters under CWA 106, following the ACOE supplemental EIS. It is our position that on-Reservation activities have minimal, if any, impact on Reservation waters. This Tribe must have grant funding to operate a monitoring crew and relies on CWA 106 funds.
2. Implementation of programs such recycling would come from the tribal Utilities Department and this grant (319) is being furthered under the Natural Resources Department. It creates a budgetary issue if we work together, but that may prove feasible if both directors are amenable. The Tribe presently hauls all waste to the transfer center for Clallam County where it is disposed of according to law and no nonpoint source pollution is expected from tribal waste. We have a sewer system, discussed above.
3. *Nonpoint source pollution from timber harvest operations* persists. It is the predominant problem in the Quillayute Basin (Dickey, Sol Duc, Calawah, and Bogachiel Rivers, their tributaries—all flow into the reservation via the Quillayute mainstem). The Forests and Fish regulations have fish protection/water quality provisions, but with timelines that allow industry to delay actions, which they do for costs reasons, until the latest possible time. This allows continued degradation in many cases. We find this incongruous when at the same time, more fish are being listed under the Endangered Species Act for Washington waters, overall (although not yet in the Quillayute). Even so we have used a number of grant programs to further restoration, partnering with the timber operators, and hope to have funds to continue these restoration programs. We have assessed the restoration needs with them and completed that assessment in 2006. Some projects have already been addressed. More remain.
4. The BIA Watershed Restoration grants under the NW Forest Plan, EPA capacity (GAP) grants and CWA 106, and other federal programs for tribes (e.g., NOAA's Pacific Coast Salmon Recovery Funds) have enabled the Quileute to study their watershed and produce valuable data regarding the nonpoint source pollution. BIA's watershed program terminated. Without these programs, the Tribe will not have the resources to validate restoration or enhancement projects, or monitor streams. Ongoing federal support of tribal programs of this nature is essential from a water quality standpoint and should be recognized as a part of the government's trust responsibility to treaty tribes.
5. The Tribe has made a major effort historically to assess and remove knotweed from its U&A watersheds that flow into the reservation, and on the reservation. But funding programs for this are now greatly reduced and often keyed into listed salmonid species. We have conducted assessments, pinpointed remaining trouble spots and are seeking grant funds.

6. The Army Corps of Engineers is (for funding reasons) handling minimal dredging of the Quillayute estuary, enough to allow a path for USCG to exit for maneuvers and rescues. The tribe's boats are often compromised and left in too shallow water for safe berthing. This also affects NOAA, which sometimes uses our port, and other vessels. The ecology of the estuary, which not only provides for 10 salmon runs but also smelt, anchovies, brown pelicans, herons, bald eagles, seals and sea lions, river otters, and countless other waterfowl (migrating species), is being compromised by a flood of sediment derived from upstream activities off-reservation. Dredging of the entire estuary is desirable to maintain a normal ecology of the river mouth. If a grant could attach contractor services for the marina area and other areas the Corps does not reach in the channel, when contractors are already mobilized to dredge the USCG path, this would greatly help.

11.0 Appendices

11.1 References:

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 20. WA State (Ecology) 303(d) list
 21. Wilson, S. 1998. Channel. In Sitkum and South Fork Calawah Watershed Analysis. Olympic National Forest, Olympia, WA. (Lead agency US Forest Service, Quileute a partner)

11.2 Examples of cooperative partnerships and processes in place

MOU with USDA Forest Service
 MOU with Olympic National Park
 MOU with Olympic Natural Resource Center of University of Washington
 WRIA 20 Watershed Planning/Implementation
 North Pacific Coast Lead Entity
 Washington Coast Sustainable Salmon Partnership
 Northwest Indian Fisheries Commission Tribal Water Quality committee
 Frequent grant partnerships with Rayonier, WDNR, USFS

11.3 Maps, Graphs, Support Materials, Tribal Protocol—CD ROM if not in text body

Quileute Reservation (topographical, GIS for acreage, aerial photos by tribe or Ecology) with water body features labeled (text body)
 Quillayute Basin rivers to show U&A rivers flowing into reservation (text body) (topographical, and Google or MS Virtual views)
 GIS data on presence of knotweed in Bogachiel River
 ACOE drawings of the Quillayute estuary depths and dredging plans (text body)

Water Quality data from CWA 106 work on reservation

List of Quileute salmon habitat projects dating from 1990s watershed analyses and afterward (this includes assessments of stream habitat and stream typing, LWD placement, conifer enhancement, culvert assessment, culvert replacement, as some examples.

Laura Urgensen master's thesis on knotweed ecology

USDA FS Record of Decision on Invasive Plants.

Data Dictionary of Olympic Knotweed Working Group for GPS

Assessment of Restoration Needs in Quillayute Basin (Report and Excel Pages)

Procurement—Quileute Tribe

Financial Management—Quileute Tribe

Contracts and Grants Protocol—Quileute Tribe