



**USDA Forest Service Watershed Condition Framework
FY18 WATERSHED RESTORATION ACTION PLAN
Shaheen Creek Watershed
Prince of Wales Island Ranger Districts, Tongass National Forest**

1. Summary

- a. **Watershed Name and HUC:** Shaheen Creek-- 190101031005
- b. **General Location:** West-central Prince of Wales Island, approximately 11 miles south of Naukati, AK.
- c. **Total Watershed Area:** 17,870 acres; **NFS area within watershed:** 100%
- d. **Watershed Characterization:**
 - **General Physiography:** The Shaheen Creek watershed covers over 28 square miles and drains into the Tuxekan Passage. A volcanic terrain consists of rugged mountains with a complex history of past glaciation. Many small and steep valleys dissect the mountains and drain into a broad valley and lowlands. Areas of carbonate bedrock result in spots of high vulnerability karst, and in irregular topographic surfaces. Precipitation is moderately high throughout the area with greater amounts of snow at high elevations during the winter season. Exposure to North Pacific storms and high winds in the lower watershed receive moderately high amounts of precipitation. The average annual precipitation ranges from 93-150 inches. Average annual maximum temperature is 51°F, while the average annual minimum is 38°F. In the mountainous terrain, elevations range from 1,000-2,000ft and in the lowlands, elevations range from 0-500ft.
 - **Land Use:** The watershed contains two land use designations and is entirely managed by the Forest Service. The majority land use designation is 51% Old Growth Reserve and the remaining 49% is designated Timber Management. This area is an important subsistence area for residents, in particular for nearby Naukati residents.
 - **General Overview of Concerns:** Watershed conditions based on the 2015 Watershed Classification and Assessment Tracking Tool (WCATT) scores emphasize concern for three main watershed condition indicators: aquatic habitat, riparian vegetation, and roads. Impacts to the watershed are primarily due to heavy riparian harvest, road density and maintenance, and proximity of roads to waterbodies. Consequently, stream reaches lack instream large wood, have low potential for future large wood recruitment, and have degraded channel shape and function. Other resource concerns include fragmented and decreased aquatic habitats due to water crossing structures that impede fish passage, and reduced deer habitat qualities due to stands with stem exclusion that impact deer foraging. Community concerns for the watershed were expressed in the 2014 Prince of Wales Island

Unified Watershed Assessment (POW UWA). In POW UWA, Shaheen Creek watershed was defined as a, “Category II- Watershed needing preventative action or protection measures in order to sustain water quality or watershed functions to meet natural resource goals”, because of its importance as a subsistence resource. Noted as high for deer and fish subsistence means, Naukati’s concerns in Shaheen Creek were attributed to past timber impacts on deer habitat and declining steelhead due to fish passage and habitat declines.

- **Important Ecological Values:** The Shaheen Creek watershed hosts Sockeye salmon, Coho salmon, Pink salmon, Chum salmon, Dolly Varden and Steelhead. Common terrestrial animals include: black bear, Sitka black-tail deer, wolf, marten, ermine, river otter, beaver, mink, dusky shrew, northern flying squirrel, Keen’s mouse, and long-tailed vole.
- **Current Condition Class: 1.4 Target Condition Class: 1**

e. Key Watershed Issues

Table 1. Attributes/Indicators with FS control to affect.

ATTRIBUTES /INDICATOR	REASON FOR RATING
3.1 Habitat Fragmentation	<i><u>Fish habitat fragmentation:</u> The District has successfully remediated several bridges and culverts that were blocking or impeding fish passage and constricting flows. Eleven culvert fish passage barriers remain in this watershed, impacting about 4% of available habitat in the watershed.</i>
3.2 Instream Large Wood	<i><u>Large wood in streams and recruitment into streams:</u> This attribute is rated “fair” because over 20% of riparian forest along alluvial fish bearing streams was harvested, resulting in reduced recruitment of large wood into streams that depend on large wood for habitat complexity and energy dissipation. Some riparian stands are dominated by alder, which is inferior to conifer as large wood in streams.</i>
3.3 Channel Shape and Function	<i><u>Stream channel and fish habitat conditions, relative to natural range and frequency:</u> Concentration of timber harvest and roads on 30% of floodplains and alluvial fans in the watershed has altered large wood supply and connections to side-channels. Stream surveys found channel incision, bank erosion, and habitat simplification, resulting in a rating of “poor” for this attribute.</i>
5.1 Riparian Vegetation Condition	<i><u>Riparian vegetation condition relative to site potential:</u> Eighteen percent of all riparian forest is young growth and/or alder-dominated, resulting in reduced large wood supply to streams and a rating of “fair” for this attribute.</i>
6.1 Road Density	<i><u>Potential for roads altering natural drainage patterns:</u> Although nearly 9.4 miles roads have been stored, the total road and trail</i>

	<i>mileage of 58 miles and road density of 2 miles per square mile in the watershed results in a rating of “fair” for this attribute.</i>
6.3 Road Proximity to Water Bodies	<i><u>Potential for roads with hydrologic connectivity and water quality impacts:</u> Fifteen percent of streams and shorelines are within 300 feet of roads, resulting in a rating of “fair” for this attribute.</i>

2. Watershed Characteristics and Conditions

- a. General Context/Overview of the Watershed:** The Shaheen Creek watershed is an inactive glacial terrain with rounded mountains and till lowlands. The three general ecological subsections within the Shaheen Creek watershed are Central Prince of Wales Volcanics, Elevenmile Till Lowlands, and North Prince of Wales-Kuiu Carbonates. The volcanic terrain consists of rugged mountains with a complex history of past glaciation. Many small and steep valleys dissect the mountains and drain into a broad valley and lowlands. Areas of carbonate bedrock result in spots of high vulnerability karst, and in irregular topographic surfaces. The majority of slopes in high elevations average 15-34%, whereas in the lowlands the majority of slopes average 0-14%. In these low sloping areas, compact glacial tills covers the sedimentary and volcanic bedrock. The gentle terrain coupled with impermeable soil has led to expansive wetlands. At high elevations, shallow soils cover bedrock of mostly volcanic rock.

- b. Watershed Conditions:** Roughly 18% of the watershed had commercial harvest between 1979 and 1998 making current young-growth stands in a 25-35 age class. Nearly 542 acres (18.1%) of the designated riparian management area has been harvested and/or roaded. Approximately 31% of harvest has occurred along floodplain process group streams mostly on the mainstem and South Fork of Shaheen Creek. The watershed has a road density of 2.07 miles/sq. miles and equates to approximately 58 miles of roads. Approximately 5 miles of road have been decommission in the watershed. Currently, 11 fish crossing structures disconnect approximately 4% of available upstream habitat.

3. Restoration Goals, Objectives, and Opportunities

- a. Goal Identification and Desired Condition:**
 - i.** Restoration goals and objectives for the Shaheen Creek area are tiered to Desired Future Conditions and restoration objectives defined in the 2016 Tongass Land Management Plan (TLMP). Stated Desired Future Conditions (DFC) in the Forest Plan are to be attained through the cumulative achievement of the goals, objectives, and desired conditions for each resource.
 These DFCs are:
 - The Forest is managed to produce desired resource values, products, services, and conditions in ways that also sustain the diversity and productivity of ecosystems.
 - Fish and wildlife habitat is maintained and improved to ensure sustainable fish and wildlife and their uses.
 - Overall aquatic habitat quality is considered good to excellent. Fish thrive in the Forest’s lakes and streams due to good water quality and other habitat features, and provide world class fisheries.

- Rural residents have opportunities to participate in subsistence activities and to harvest subsistence resources in accordance with direction in the Alaska National Interest Lands Conservation Act of 1980 (ANILCA).

b. Objectives:

i. Alignment with National, Regional, or Forest Priorities

- Restoration objectives for Shaheen Creek area align with a national objective to foster resilient, adaptive ecosystems to mitigate climate change by means that maintain resilient land and water conditions at the watershed level and restore deteriorated lands and waters. Likewise, a regional objective of maintaining and improving ecological resiliency through a multi-disciplinary and integrated approach primarily by way of a restoration focus area supports the Shaheen Creek area DFC.
- Relevant Forest-wide multi-use goals and objectives for Shaheen Creek watershed are as follows:
 1. Maintain or restore the natural range and frequency of aquatic habitat conditions on the Tongass National Forest to sustain the diversity and production of fish and other freshwater organisms.
 2. Maintain soil productivity Forest-wide and minimize soil erosion resulting from land-disturbing activities.
 3. Maintain and restore the biological, physical, and chemical integrity of Tongass National Forest waters.
- Additional direction is found in the Forest Plan Standard and Guidelines for water, fisheries, and riparian resources:
 1. Maintain or restore stream banks and stream channel processes.
 2. Maintain or restore natural and beneficial quantities of large woody debris over the short and long term.
 3. Maintain or restore optimum water temperatures for salmonids, considering both winter and summer habitat requirements, climate, and natural watershed characteristics.
 4. Maintain, restore, or improve, where feasible, stream conditions that do not disrupt the migration or other movement of aquatic organisms inhabiting a waterbody.
 5. Maintain riparian areas in mostly natural conditions for fish, other aquatic life, old-growth and riparian-associated plant and wildlife species, water-related recreation, and to provide for ecosystem processes, including important aquatic and land interactions.
 6. Manage activities to meet state water quality standards and protect aquatic and terrestrial riparian habitats, channel and streambanks, and provide for floodplain stability.

ii. Alignment with State or local goals

- Meet Alaska Regional soil quality standards.
- Attain State of Alaska water quality standards Forest-wide.

- Provide for the continuation of subsistence uses and resources by rural Alaskan residents.
- Proposed activities in the watershed meet all required permits.

c. Opportunities

i. Partnership Involvement: The Nature Conservancy has been a long time partner of the Forest Service in watershed restoration efforts and continue to be engaged in watershed restoration planning and implementation. Stewardship contracting may be used to complete projects and achieve restoration goals through a multi-disciplinary and integrated approach. Other partnerships will be pursued when and if opportunities arise.

ii. Outcomes/Output

a) Performance Measure Accomplishments: When essential restoration projects are completed, the Shaheen Creek watershed will move from a condition class rating of (1.4) to properly functioning condition (1). Specific accomplishments have been entered into the Watershed Improvement Tracking (WIT) corporate database and include: a) acres of watershed improvement for upland and riparian areas, b) miles of stream restored, c) road miles stored with proper BMPs, and d) number of structures that have been replaced, or removed to meet fish passage standards.

b) Socioeconomic Considerations: Improved fish habitat and watershed condition will increase or maintain fish abundance and opportunity to catch those fish. Similarly, improved wildlife habitat condition will increase or maintain wildlife (particularly deer) abundance and opportunity for subsistence. Communities in southeast Alaska depend on these fishery resources for personal, cultural and commercial benefits. Restoration projects will also create jobs and provide added financial benefits to local economies. Post-project monitoring will help promote public awareness and ownership in restoration outcomes.

d. Specific Project Activities (Essential Projects)

Essential Project #1

- Attribute/Indicator Addressed: Habitat Fragmentation, Road Maintenance
- Project Description: Replace 11 fish barrier structures with AOP structures reconnecting approximately 2.5 miles of upstream habitat.
- Possible Partners Involvement and Funding: Joint Chiefs', Local tribes
- Timeline: Starting in FY2020.
- Estimated costs and associated Budget Line Item : ~\$1.19M, NFWF, NFVW, CMRD

Essential Project 1- Fish Passage Barriers

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Water Crossing	Stream Class	Passage	Upstream Habitat (m)	Remediation Score	Replacement Type	Est. Cost
2050000-19.19	2_2	Red	563	46.6	Modular Bridge	\$ 112,500
2050000-19.2	2_2	Red	140	4	Corrugated metal pipe	\$ 34,252
2050000-19.51	1_1	Red	844	580	Modular Bridge	\$ 258,750
2050000-19.53	1_1	Red_Fx	251	5	Corrugated metal pipe	\$ 34,252
2050000-20.79	2_2	Gray	95	3	Corrugated metal pipe	\$ 62,724
2050000-21.88	1_1	Red	152	17	Corrugated metal pipe	\$ 44,715
2050000-22.23	1_1	Red	274	15	Corrugated metal pipe	\$ 183,780
2050000-22.43	2_2	Red	388	30	Corrugated metal pipe arch	\$ 44,715
2050000-22.72	2_2	Red	178	46	Modular Bridge	\$ 112,500
2051000-0.04	1_1	Red	565	60	Corrugated metal pipe	\$150,000
2051000-1.42	1_1	Green	483	n/a	Corrugated metal pipe	\$150,000

Essential Project #2

- Attribute/Indicator Addressed: Channel Shape and Function, Instream Large Wood
- Project Description: Restore or maintain aquatic habitat and hydrologic function with large wood placement instream and on floodplains in 8 identified stream reaches totaling approximately 2 miles of stream.
- Possible Partners Involvement and Funding: The Nature Conservancy, Joint Chiefs', State of Alaska
- Timeline: Starting in FY2021
- Estimated costs and associated Budget Line Item: ~\$1.58M, NFWF, NFVW

Essential Project 2- Stream Restoration. Note that "MS2" was dropped and therefore is not described in the table.

Site Name	Length (mi)	Est. Wood Count	Equipment Needed	Description	Est. Cost
<u>MS1</u> (Mainstem, upper reach)	0.26	100	Helicopter	Build a series of log jams and add floodplain roughness to aggrade the channel and reactive the floodplain.	\$ 302,381
<u>MS3</u> (Mainstem, above bridge)	0.33	300	Excavator	Dissipate stream power by adding channel roughness and encouraging split channel flow.	\$ 217,611
<u>MS4</u> (Mainstem, near estuary)	0.22	220	Excavator	Increase channel complexity and encouraging floodplain connectivity by building channel-margin and mid-channel jams.	\$ 191,229
<u>SF1</u> (South Fk, near beaver complex)	0.15	60	Helicopter & Excavator	Remove old bridge abutment material and add woody debris to increase channel roughness.	\$ 236,463

<u>SF2</u> (South Fk, above culvert)	0.3	120	Excavator	Maintain existing sinuosity and prevent loss of complexity by adding woody debris to existing jams.	\$ 133,862
<u>SF3</u> (South Fk, below culvert)	0.36	120	Helicopter	Improve channel roughness and complexity by adding woody debris.	\$ 333,427
<u>SF4</u> (South Fk, near estuary)	0.27	65	Excavator	Improve channel roughness and complexity by adding woody debris.	\$ 93,809
<u>NF1</u> (North Fk, below bridge)	0.1	100	Excavator	Build a series of log jams and add floodplain roughness to aggrade the channel and reactive the floodplain.	\$ 70,695

Essential Project #3

- Attribute/Indicator Addressed: Road Maintenance
- Project Description: Improve road drainage features and water crossings applying BMPs on roughly 2 miles of road.
- Possible Partners Involvement and Funding: The Nature Conservancy, Joint Chiefs'
- Timeline: Starting FY2021
- Estimated costs and associated Budget Line Item: ~\$50,000 NFWF, NFWW.

<i>Essential Project 3- Road Maintenance</i>					
Road ID	Objective Maintenance Level	Operating Maintenance Level	Length (miles)	Action	Est. Cost
2050890	ML1	ML1	0.05	Excavate existing road material from floodplain. Should occur simultaneously with MS1 stream restoration.	\$ 40,102
2050896	ML1	ML2	0.94	Store road and install traffic barrier.	\$ 3,500
2051040	ML1	ML1	1.06	Install waterbars and traffic barrier. Clean plugged culverts.	\$ 6,500

Essential Project #4

- Attribute/Indicator Addressed: Riparian Stand Improvements- Future Instream Wood Recruitment and Wildlife Habitat Improvements
- Project Description: Thinning approximately 290 acres in riparian stands to improve terrestrial habitat, hydrologic function and aquatic habitat by accelerating stands toward old growth characteristics.
- Possible Partners Involvement and Funding: The Nature Conservancy, Joint Chiefs'
- Timeline: Starting in FY2020.
- Estimated costs and associated Budget Line Item: ~\$290,000, NFWF, NFWW

<i>Essential Project 4- Riparian Treatment</i>		
Action	Riparian Acres	Est. Cost
Riparian thinning (adjacent to stream restoration)	270	\$270,000
Conifer release in alder dominated riparian areas	21	\$21,000

e. Costs:

Table 2. Overall estimated Costs.

	Planning	Design/NEPA	Implementation	Project Monitoring
FS Contribution			\$2,487,481	
Partner Contribution (both in kind and \$)			\$621,870 (Est. 20% of total cost)	
Estimated Total			\$3,109,351	

f. Timelines and Project Scheduling:

Table 3. Project timelines.

FY	Essential Project	FS Est. Cost	Partner Est. cost
20-25	EP1- Replace 11 fish barrier crossings	\$950,550	\$237,638
21-26	EP2- Complete 8 instream restoration reaches	\$1,263,582	\$315,895
21-26	EP3- Complete road improvements (~2mi.)	\$40,082	\$10,020
21-26	EP4- Riparian stand improvements (~290acres)	\$233,267	\$58,317

4. Restoration Project Monitoring and Evaluation:

Project monitoring will be completed by the aquatics staff following the Tongass National Forest Core Guidance. Pre and post treatment monitoring will be applied to all medium to large channel restoration work. Bringing fish passages and road conditions into compliance by Forest BMP standards may be evaluated by BMP Soil and Water Monitoring standards. All completed restoration activities will be entered into NRIS WIT, FACTS, and INFRA in the year they are completed.

5. Attached Maps:

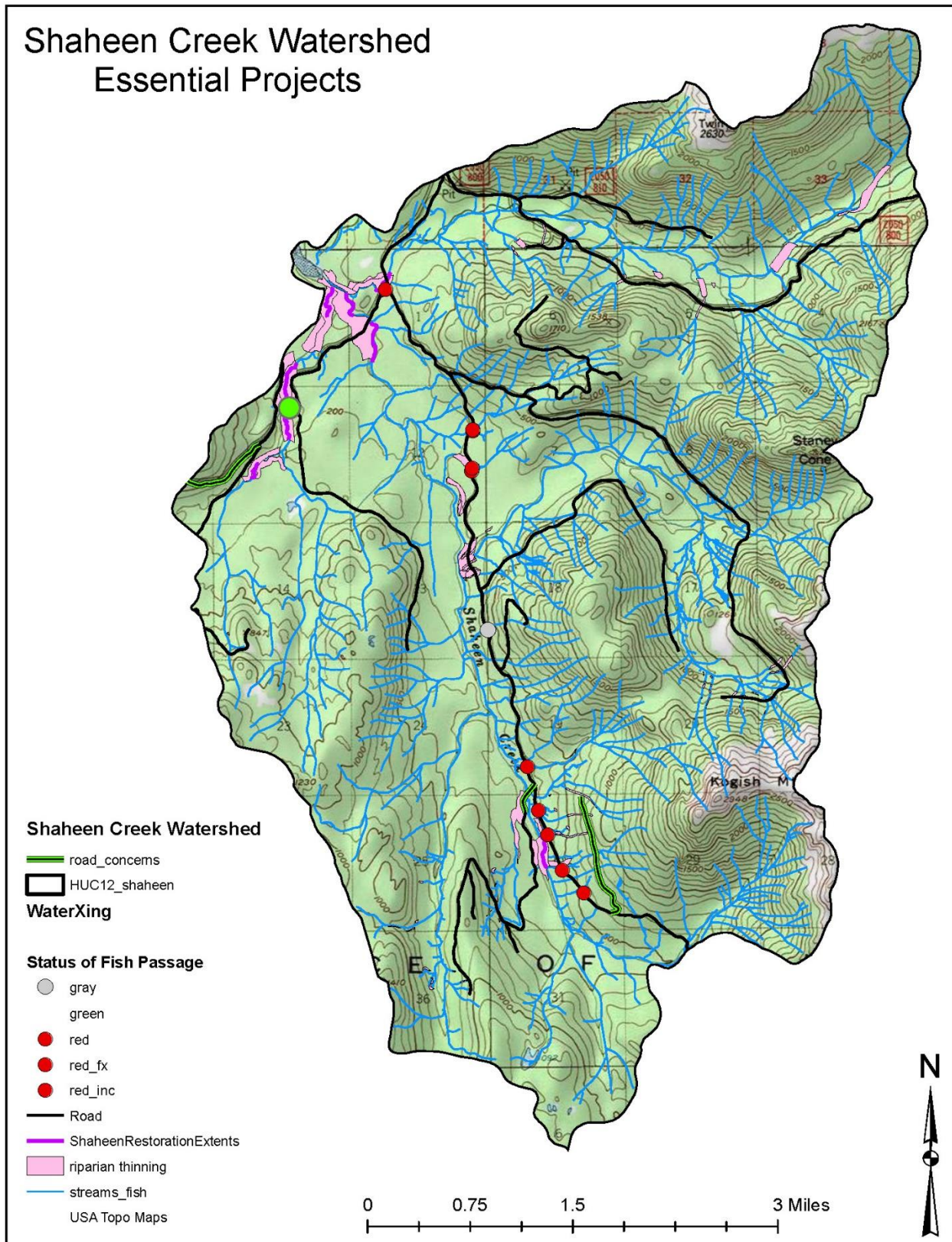


Figure 1. Location of Essential Projects identified within the Shaheen Creek watershed.

Action Plan Date: _____

Reviewing Official and Title: _____

M Earl Stewart, Forest Supervisor

The Forest/Unit Supervisor's signature signifies:

- approval of the priority watershed
- the validity of the planned essential projects
- verification that all watershed condition class attribute ratings in the WCATT database for this watershed accurately reflect the assessment results.

Reviewing District Official: Scot Shuler, District Ranger, 907-826-3271

Forest Contact Information: Helen Sladek, Hydrologist, 907-826-1634; or Ariel Cummings, Fisheries Biologist, 907-826-1602