



United States Department of Agriculture

Gathering Information

What to Know and How to Find It

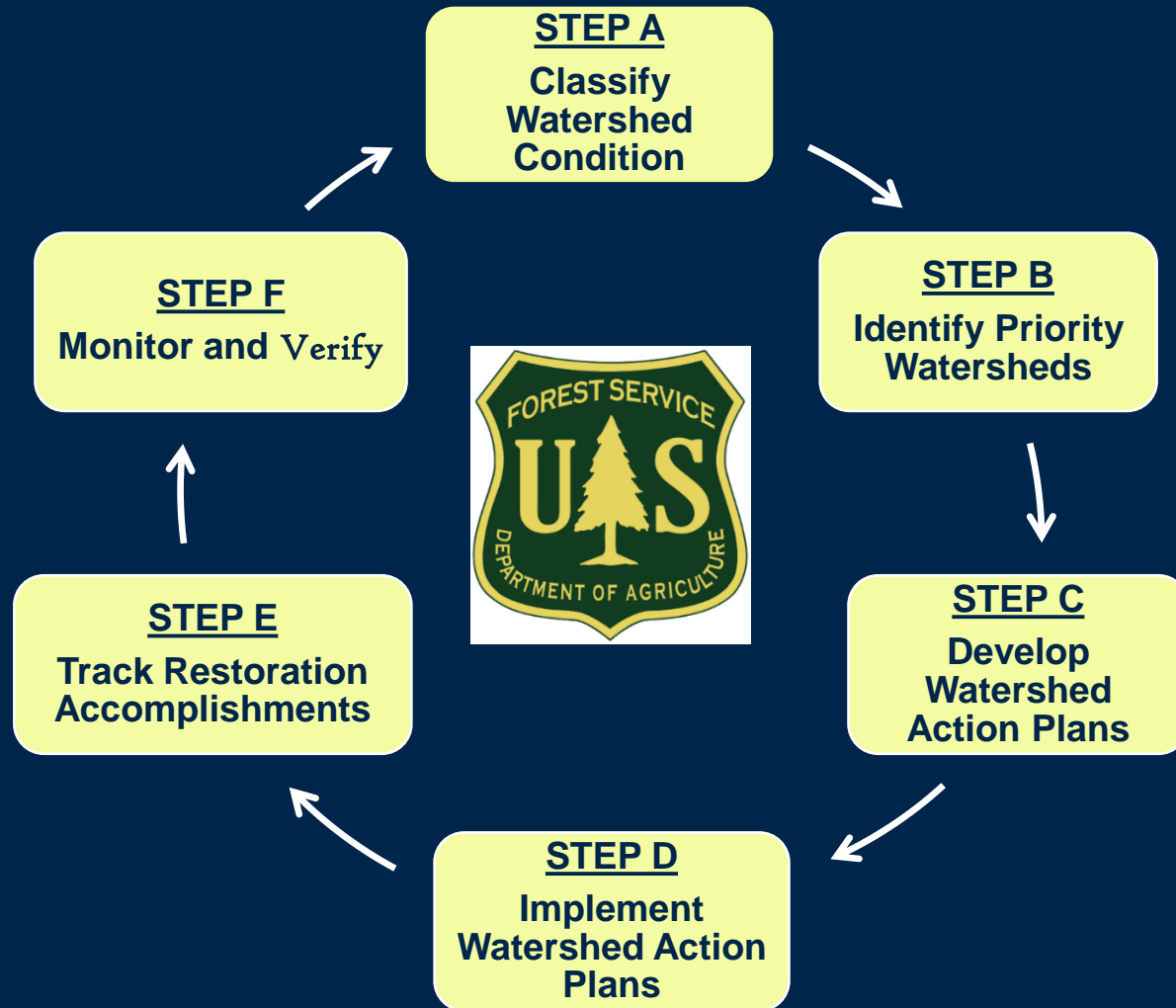
March 16, 2021

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The Watershed Condition Framework (WCF)

A Six-Step Adaptive Management Process

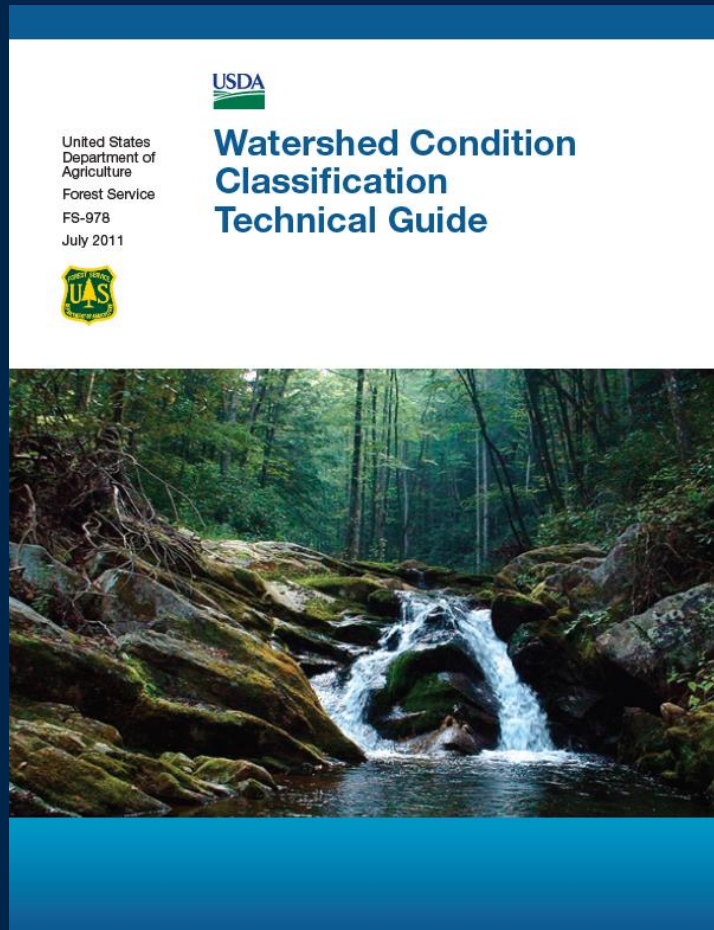


Watershed Condition Assessment

Watershed Condition Classification Technical Guide FS-978 (July 2011)

Analysis

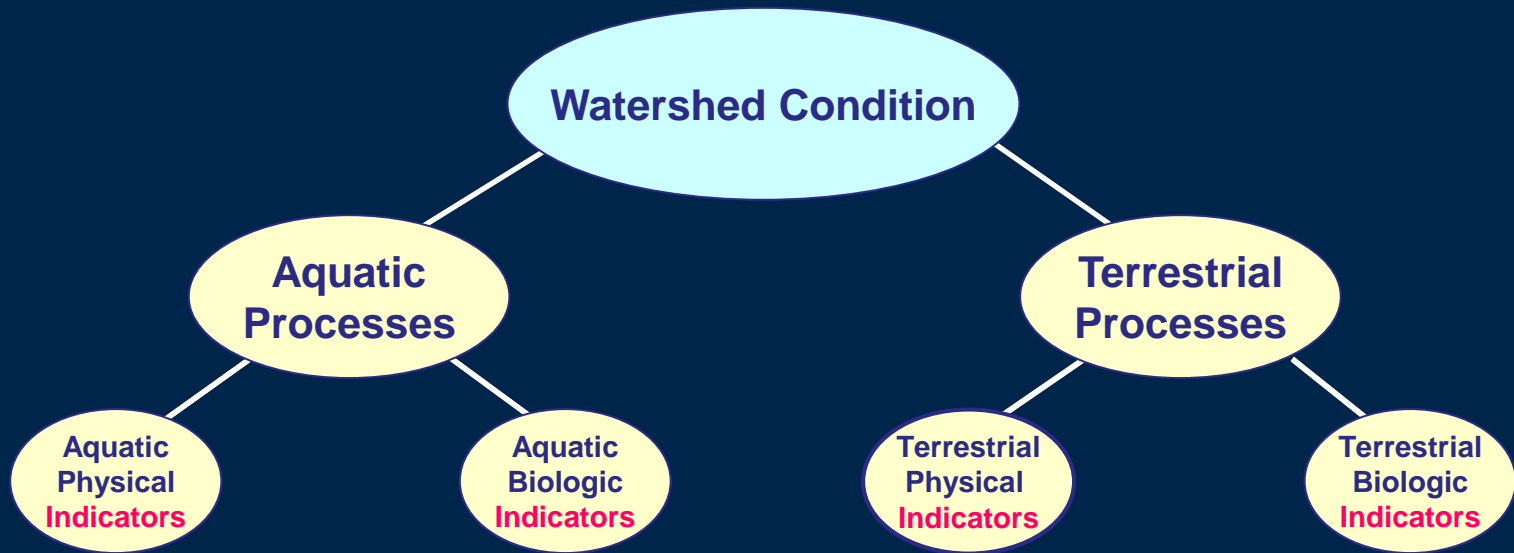
- **Coarse-Scale**
- **GIS-Based**
- **Criteria/Guidelines**



Condition Classes

- Properly Functioning**
- Functioning At Risk**
- Impaired Function**

Watershed Condition Classification



Water Quality

Water Quantity

Aquatic Habitat

Aquatic Biota

Riparian
Vegetation

Road & Trail
Network

Soil Condition

Fire Regime

Forest Cover

Range & Open
Areas

Terrestrial NNIS

Forest Health

12 Indicators

**Aquatic
Indicators**

**Terrestrial
Indicators**

Watershed Condition Framework

Overview

Watershed Classification Interactive Map Viewer

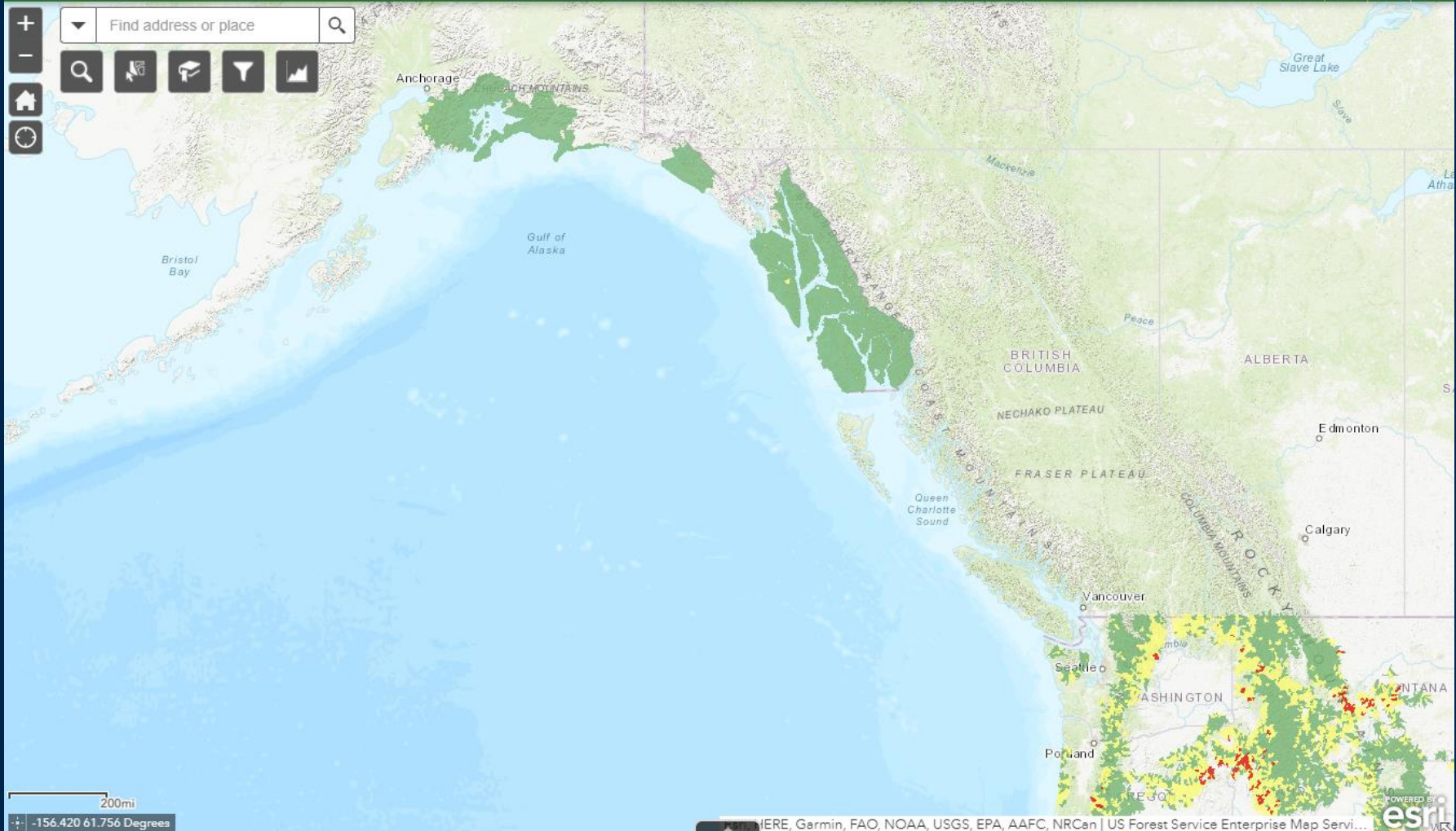
Documents

Watershed Classification Interactive Map Viewer



Watershed Classification Interactive Map Viewer

User Guide



Watershed-Scale Planning

- Determine project objectives
- Compile information
 1. Remote sensing data
 2. Field surveys
- Evaluate existing condition
- Identify values and assess risks
- Propose restoration activities
- Implement restoration
- Monitor effectiveness



Evaluate existing condition – values and risks

- Where are **valuable aquatic and riparian habitats**?
- What are the **effects of past management**?
- Where is instream and floodplain large wood lacking?
- How are roads affecting hydrologic and sediment transport processes?
- Where are **chronic sediment sources**?
- Where do beaver impact road or stream functions?
- Where have landslides affected streams?



Data Sources

- Data digging (file cabinets, computer files, agency contacts)
- Geospatial data
- Interviews
- References and reports
- Computer modeling
- Field surveys



Online Databases

- ADF&G Interactive Mapper – Anadromous Waters Catalog (AWC), Freshwater Fish Inventory Database (AFFI), and Fish Passage Inventory Database
<https://adfg.maps.arcgis.com/apps/MapSeries/index.html?appid=a05883caa7ef4f7ba17c99274f2c198f>
- Southeast Alaska Geospatial Library <https://data-seakgis.opendata.arcgis.com/>
- USFS Geospatial Data Discovery
<https://usfs.maps.arcgis.com/home/index.html>

Field Surveys

- Stream/riparian condition surveys to identify restoration opportunities
- Stream morphology surveys (cross section, long profile, and pebble count) for project design
- Road condition surveys to identify maintenance needs and sediment sources
- Fish passage surveys to identify barriers and restoration opportunities



Propose actions to meet project objectives

- Where can stream/riparian restoration projects improve water quality, aquatic habitats, or stream resiliency?
- Where and what restoration actions are needed to improve valuable (social and ecological) riparian habitats?
- Where can road maintenance, storage, or decommissioning improve water quality and fish passage?
- Which roads are needed?
 - *Propose maintenance strategy*
- Which roads are no longer needed?
 - *Store or decommission*

A Framework for Setting Watershed-scale Priorities for Forest and Freshwater Restoration on Prince of Wales Island

September 5, 2008

The Nature Conservancy
Protecting nature. Preserving life.



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Risks to Watershed Values

❖ Upland

- Habitat fragmentation
- Increased erosion from loss of vegetation on steep slopes;
- Nutrient depletion in soils from loss of vegetative cover and increased rates of water flow
- Altered maintenance and storage of water in forested wetlands (USFS 2004)

❖ Riparian and In-stream

- Decreased recruitment capacity for large woody debris contributing to in-stream habitat structure (Fig 2)
- Sedimentation regime changes result in landslides in uplands and erosion of development
- Unmaintained culverts resulting in passage
- Decrease in large woody debris recruitment caused loss of pools that provide critical habitat, decreased cover for rearing channel instability, shifts in aquatic (USDA Forest Service 1995)

Prioritize restoration based on habitat condition, biological and social values, and opportunities

Table 5. Potential indices that characterize condition, values and restoration opportunities related to terrestrial and freshwater habitats on Prince of Wales Island.

Habitat Functions		Indicator (for watershed-scale planning)
CONDITION	FRESHWATER SYSTEMS	
	Riparian Functions	<ul style="list-style-type: none"> ♦ Percent of riparian forest in young growth (YG) ♦ Acres of YG riparian forest in wood dependent channels
	Connectivity	♦ Number of "red pipe" culverts within watershed
	Water Quality	<ul style="list-style-type: none"> ♦ Road miles and/or density in watershed ♦ Number of stream crossings
	Water Quantity	<ul style="list-style-type: none"> ♦ Acres of harvest on steep slopes (>67%) ♦ Percent of watershed area in YG
	TERRESTRIAL SYSTEMS	
	Deer Winter Range	<ul style="list-style-type: none"> ♦ Acres of YG (not cut or thinned within 15 yrs) <ul style="list-style-type: none"> ○ S or W exposure ○ <800 ft elevation ○ Large patch size (1/2 home range)
	Karst forest	♦ Acres of YG on high vulnerability karst
	Connectivity	♦ Identify corridors between large intact habitat patches
	Biological / Human Values	
VALUE	FRESHWATER SYSTEMS	
	<ul style="list-style-type: none"> ♦ ADF&G Primary Salmon Producers ♦ Unique or sensitive stocks (Halupka et al. 2000) ♦ Salmon distribution and diversity index 	
	TERRESTRIAL SYSTEMS	
	<ul style="list-style-type: none"> ♦ Relative biodiversity index (Albert and Schoen 2007a) <ul style="list-style-type: none"> ○ Habitat capability for deer, bear & murrelet ○ Freshwater salmon distribution ○ Large-tree forest (riparian, upland, karst) ○ Estuaries (acres of salt marsh habitat) ♦ Connectivity points (island "bottle necks") 	
	HUMAN VALUES	
	<ul style="list-style-type: none"> ♦ Community water supply ♦ Subsistence salmon harvest ♦ Deer & Bear harvest (by WAA) ♦ Guided sport fishing permits 	
OPPORTUNITY	Opportunity	
	Commercial YG Potential	<ul style="list-style-type: none"> ♦ Commercial thinning opportunities (acres x size class) ♦ Fish & wildlife habitat improvement (YG in NDEV)
	Partnerships	♦ Existing watershed councils
	Research Study Sites	♦ Long-term study sites as basis for adaptive management
	Other factors	♦ Logistics, visibility, funding opportunities, etc.

Solicit feedback regarding social values, subsistence needs, recreational opportunities through interviews, workshops, online surveys

watershed restoration needs.

Workshop I Objectives:

- Design a method for systematic prioritization of restoration activities on Prince of Wales Island that includes aquatic and terrestrial habitats;
- Review and incorporate the best available science and existing young-growth strategies and planning;
- Outline a science-based framework for restoration planning and monitoring.

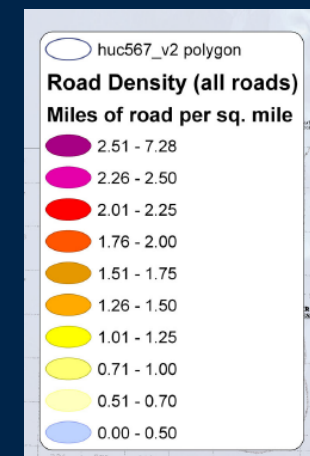
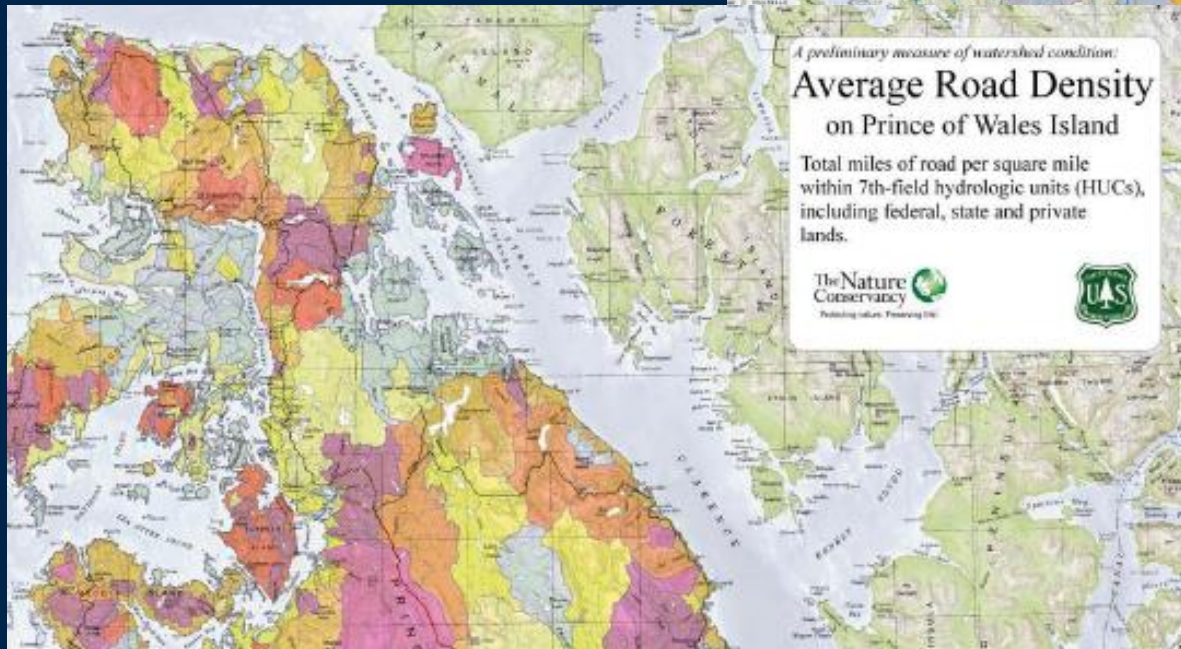
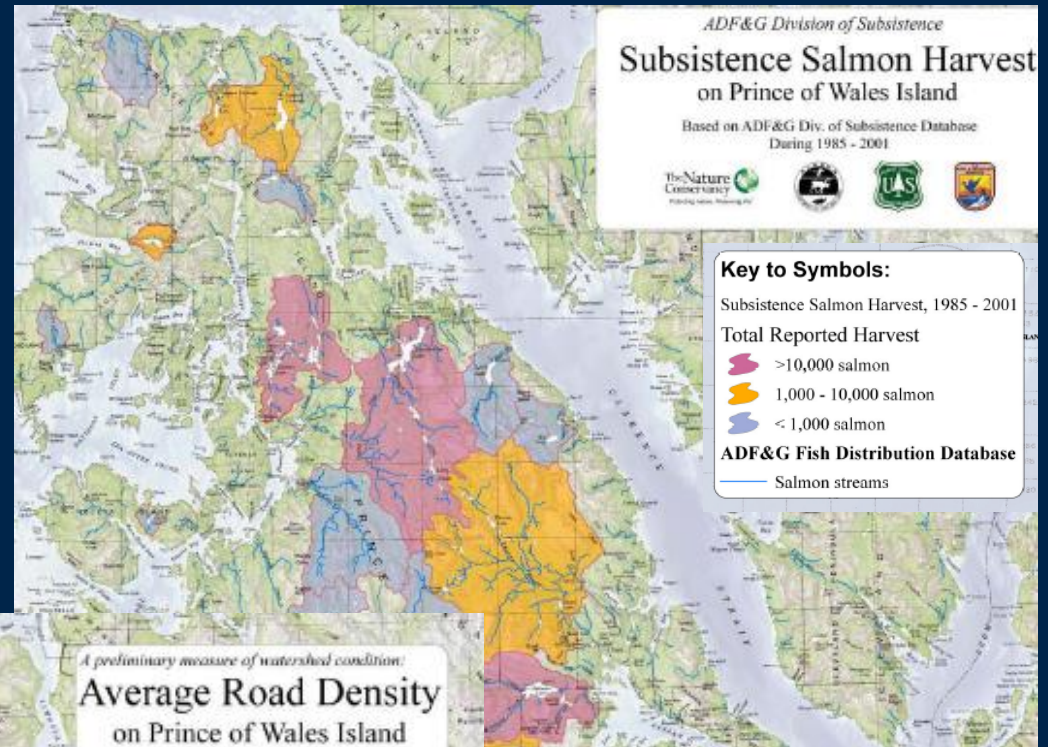


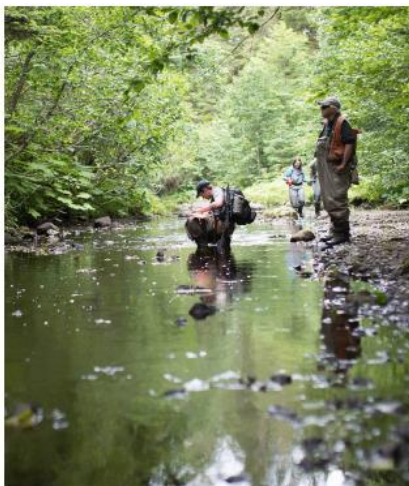
Workshop II Objectives:

- Evaluate the relative need for restoration and management among watersheds island-wide;
- Build consensus on watershed priorities with input from landowners, watershed councils, agency staff, interested stakeholders;
- Apply information on priority watersheds to help guide partnerships in restoration work on Prince of Wales Island and provide a decision-making tool for local restoration practitioners.



Value and Risk





HOONAH NATIVE FOREST PARTNERSHIP

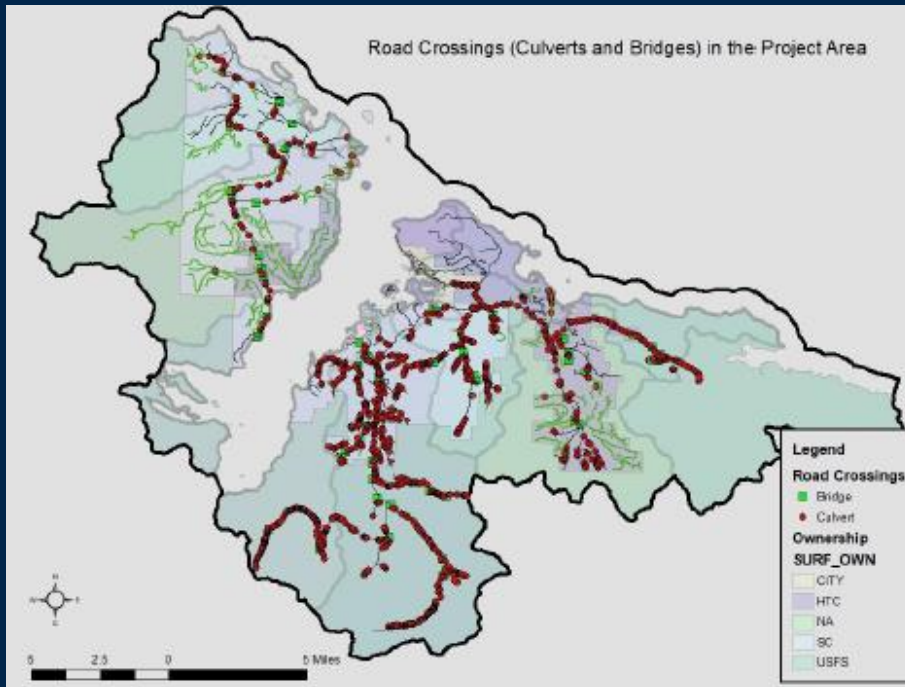
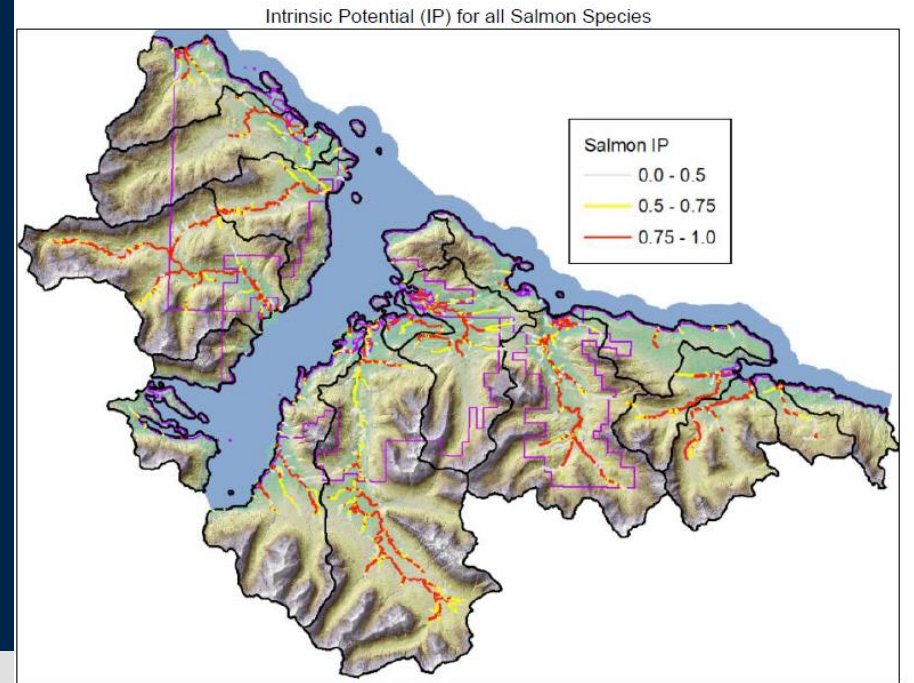
Technical Report #1 June 2020

OUR MISSION

Now and through the next century, the lands surrounding Hoonah will provide abundant resources that support our culture, economy, and community. The Hoonah Native Forest Partnership (HNFP), which includes public and private landowners, will promote sustainable economic development, local workforce employment, ecological restoration, and resource management, with the goal of ensuring the conservation of fish, wildlife, and forest resources. Through involvement in this partnership, today's citizens of Hoonah, as well as succeeding generations, will have improved potential to benefit from subsistence resources, such as blueberries, fish, wildlife, and future employment opportunities afforded by sustainable management of these lands

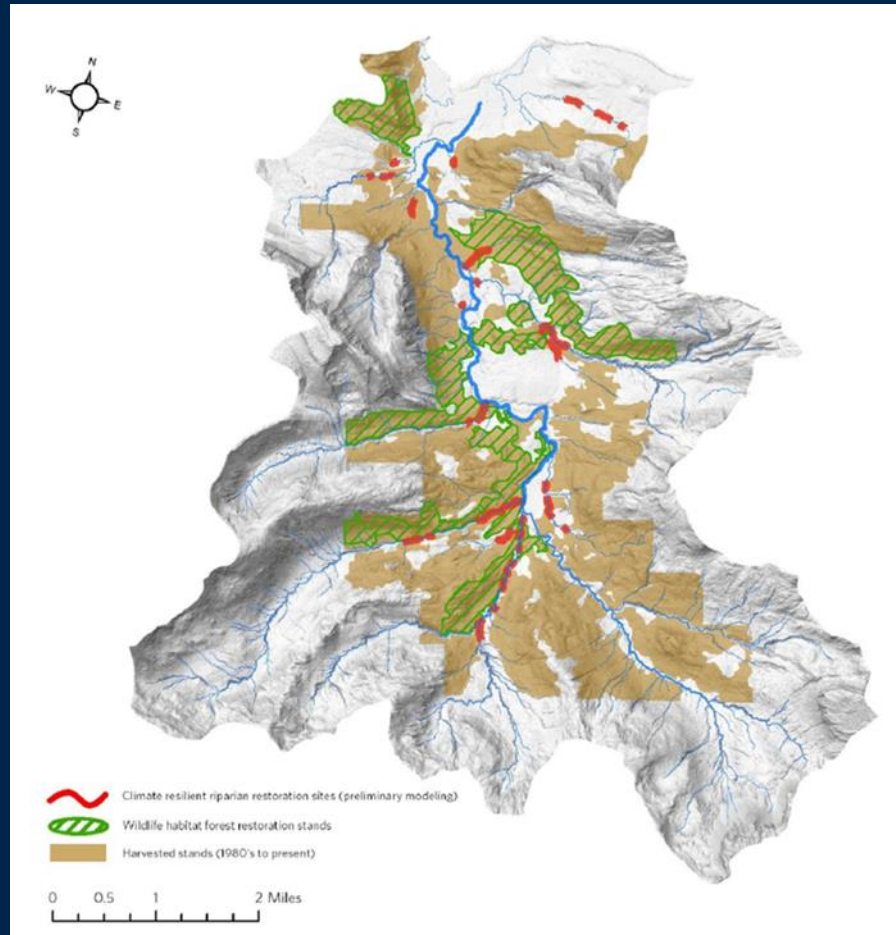
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Value and Risk



Habitat potential and risk
of sediment delivery from
road crossings

Consider climate change and opportunities for building resilience



- Maps and tables identify relevant information to implement projects
- Consider ALL opportunities



Table 60 Gartina Creek High and Medium Priority Opportunities

Project Type	Identification	Owner	Outcome
Water Quality	HNFP ID 8025	Sealaska	Improve Water Quality
Water Quality	HNFP ID 8028	Sealaska	Improve Water Quality
Water Quality	HNFP ID 8032	Sealaska	Improve Water Quality
Water Quality	HNFP ID 8034	Sealaska	Improve Water Quality
Water Quality	HNFP ID 8061	Sealaska	Improve Water Quality
Water Quality	HNFP ID 8062	Sealaska	Improve Water Quality
Passage	HNFP ID 8502City	City	Improve Passage for Fish
Passage	HNFP ID 8502City	City	Improve Passage for Fish
Water Quality	HNFP ID 8502City	City	Improve Water Quality

ECOLOGICAL ATLAS OF SOUTHEAST ALASKA



Core Areas of High Biological Value Watershed Scale



The analysis of core areas of biological value is based on an analytical model that identifies the highest ecological value for a combined suite of species, using the smallest footprint possible. The resulting core areas are spread across biogeographic provinces to ensure adequately viable and well-distributed populations. This analysis was first completed using salmonid habitat (all six species combined) as a single focal target, as well as old-growth forest (big tree riparian and upland stands), estuaries, brown bear and black bear summer habitat, Sitka black-tailed deer winter habitat, and Marbled Murrelet nesting habitat. The Marxan model was utilized to optimize a conservation area design for the combination of these values. Watersheds, or Value Comparison Units (VCUs) represent ecologically based functional units that are useful at a broad-scale for assessment of conservation values.

Biological Value¹

Percentile	Marxan Score
75 – 100%	38 – 50
50 – 75%	26 – 37
25 – 50%	13 – 25
0 – 25%	0 – 12

1. Albert and Schoen 2007b.



Pacific Salmon Hydroclimatic Sensitivity Index



The Pacific salmon hydroclimatic sensitivity index is based on predicted hydrologic change through the year 2080 using climate change models. The analysis of hydroclimatic sensitivity focused on identifying significant changes during some of the most sensitive periods for salmon, the spawning and incubation periods. That was combined with an index of species habitat and diversity. The indices were then related and categorized into a matrix identifying four levels of priority. Steeper, snow-fed, mountainous watersheds exhibited the greatest changes: increase in discharge, earlier spring melt, and transition to rain-fed hydrologic patterns. This matrix is a prioritization framework for long-term monitoring and other studies.

Sensitivity index¹

Salmon habitat & species diversity	Moderate priority	Highest priority
	Lowest priority	High priority

Hydroclimatic sensitivity

/// Southeast Alaska anadromous fish watershed²

□ Salmon priority watershed (#1 ranked in province based on total habitat area)³

1. Shanley and Albert 2014.

2. Alaska Department of Fish and Game 2013.

3. Albert and Schoen 2007.



Tips for successful restoration planning

- Be inclusive
- Meet early and often
- Take adequate time to plan
- Maintain consistent and organized data
- Know your goals and objectives
- Identify values
- Evaluate risks
- Weigh values and risks to develop restoration opportunities
- Prioritize actions (include all parties)
- Implement projects and monitor outcomes
- Report out

