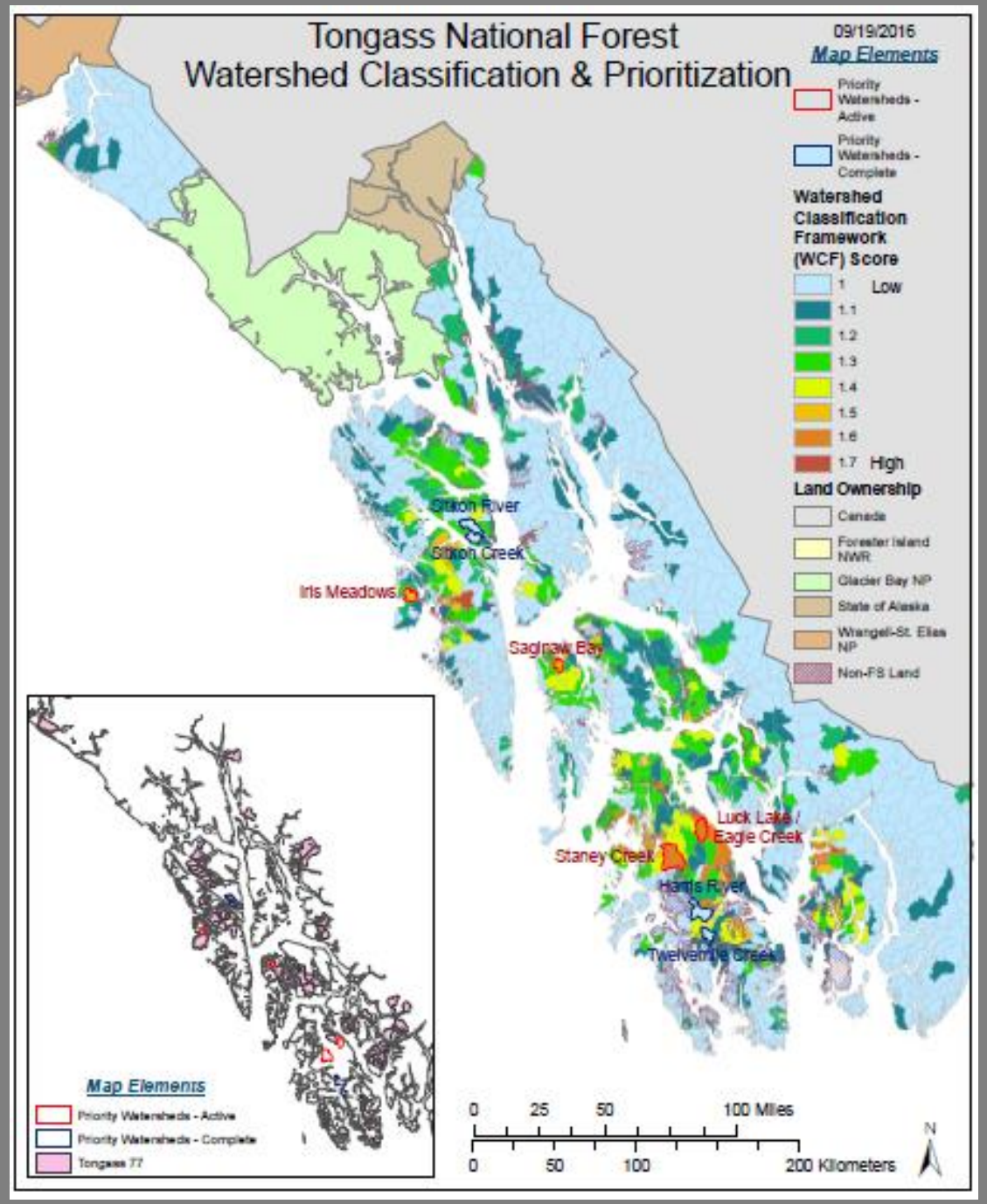
Watershed Assessment Approaches and Restoration Priorities

--Tongass National Forest--

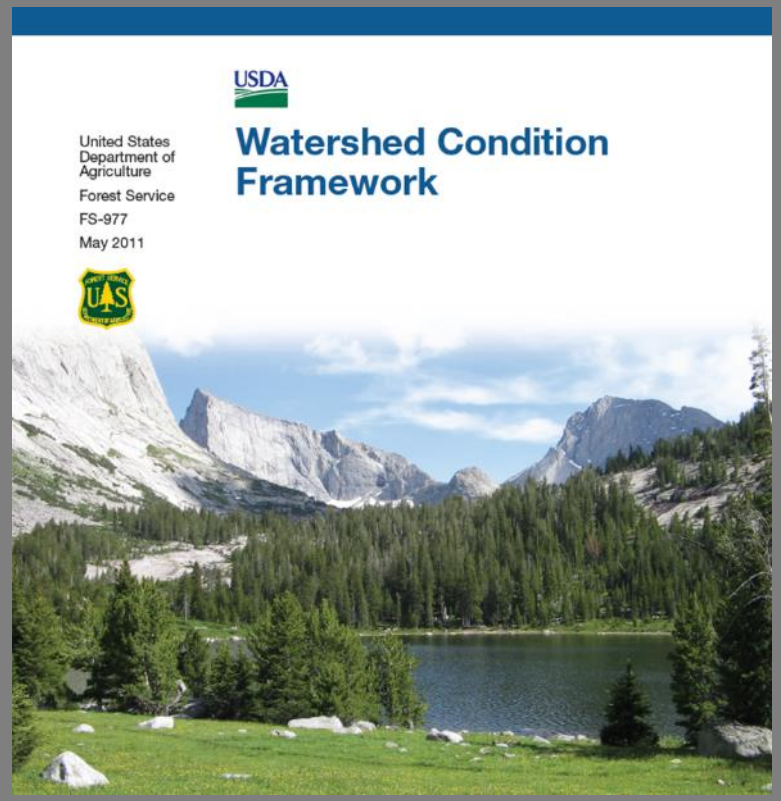
Tongass Forest Plan Goal: Maintain or restore the natural range and frequency of aquatic habitat conditions to sustain the diversity and production of fish and other freshwater organisms.

Julianne Thompson,
Southeast Alaska Watershed Restoration Workshop, March 2018



Outcomes for Today

- **Regional assessment – Watershed Condition Framework**
- **Priority Watershed Focus**
- **Watershed Scale Approach**
- **Successes, Challenges**



When watersheds are functioning properly…

they create and sustain terrestrial, riparian, aquatic, and wetland habitats that are capable of supporting diverse populations of native aquatic- and riparian-dependent species.

They are resilient and recover rapidly from natural and human disturbances.

The Tongass National Forest is globally recognized as a “refuge” of intact habitat for wild Pacific Salmon

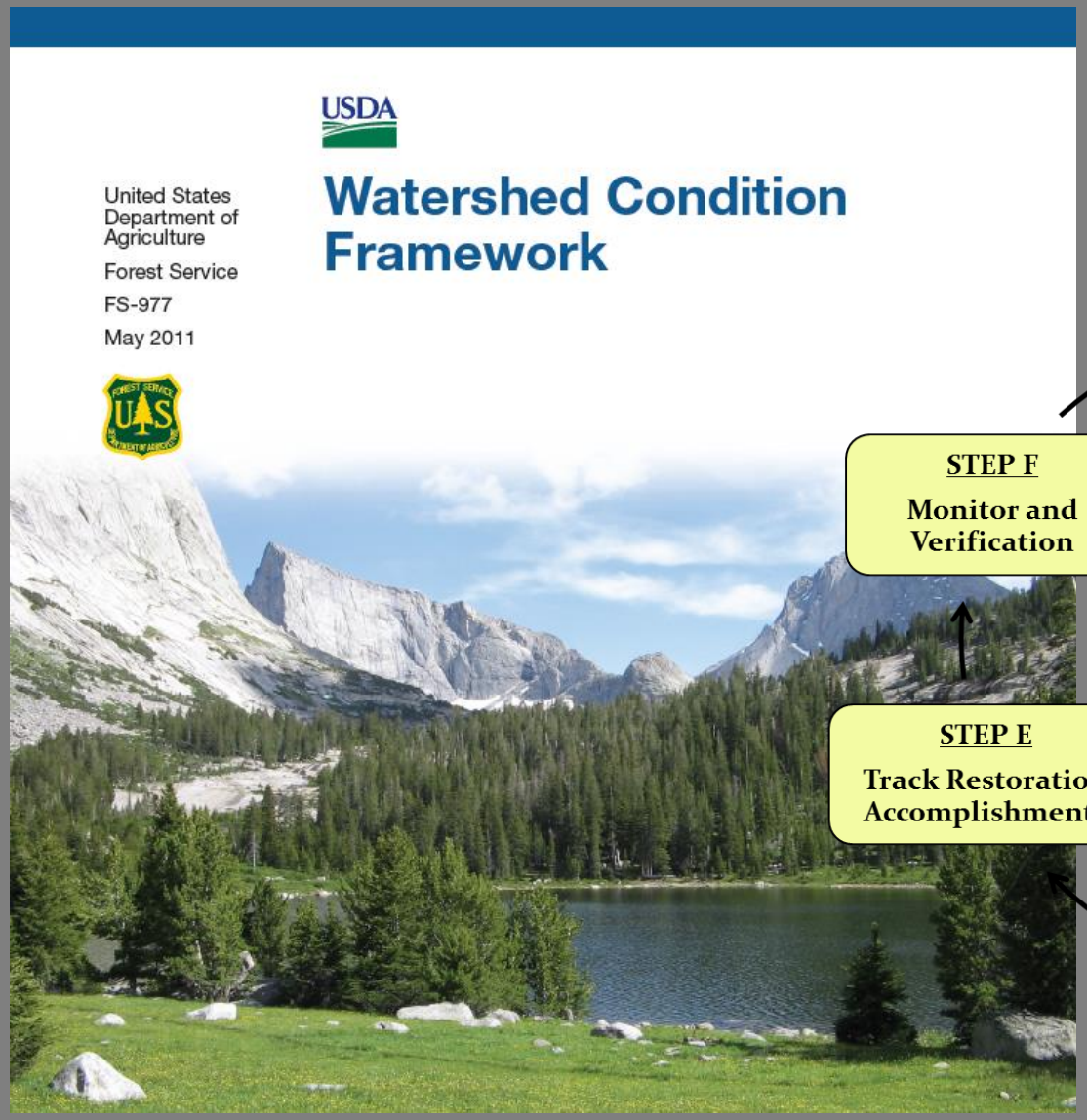
Salmon provide jobs– 80% of the SE Alaskan commercial catch comes from Tongass watersheds

Salmon are a vital subsistence resource – 90% of rural households in SE Alaska use salmon

Most of our salmon-producing watersheds are in pristine condition

Watershed Condition Framework

National guidance, applied locally



STEP A
Classify Watershed Condition

STEP B
Prioritize Watersheds for Restoration

STEP C
Develop Watershed Action Plans

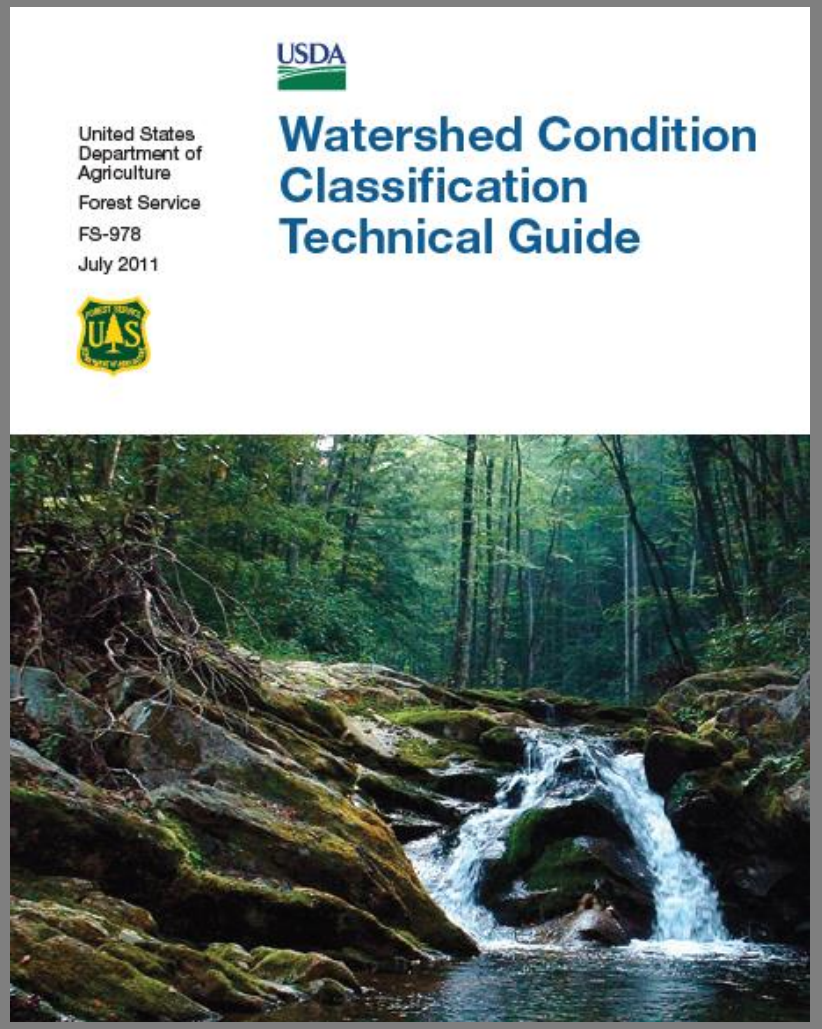
STEP D
Implement Integrated Projects

STEP E
Track Restoration Accomplishments

STEP F
Monitor and Verification

Assign Condition Class
900 Tongass watersheds

- Class 1 = Functioning Properly – exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition (score 1 – 1.6)
- Class 2 = Functioning at Risk – exhibit moderate geomorphic, hydrologic, and biotic integrity relative to their natural potential condition (score 1.7 – 2.2)
- Class 3 = Impaired Function - exhibit low geomorphic, hydrologic, and biotic integrity relative to their natural potential condition (score 2.3 -3)



WATERSHED CONDITION INDICATORS (12 Indicator Model)

AQUATIC PHYSICAL (Weight = 30%)

1. WATER QUALITY
1. Impaired Waters (303d Listed)
2. Water Quality Problems (Not Listed)

2. WATER QUANTITY
1. Flow Characteristics

3. AQUATIC HABITAT
1. Habitat Fragmentation
2. Large Woody Debris
3. Channel Shape and Function

AQUATIC BIOLOGICAL (Weight = 30%)

4. AQUATIC BIOTA
1. Life Form Presence
2. Native Species
3. Exotic and/or Invasive Species

5. RIPARIAN/WETLAND VEGETATION
1. Vegetation Condition

TERRESTRIAL PHYSICAL (Weight = 30%)

6. ROADS & TRAILS
1. Open Road Density
2. Road Maintenance
3. Proximity to Water
4. Mass Wasting

7. SOILS
1. Soil Productivity
2. Soil Erosion
3. Soil Contamination

TERRESTRIAL BIOLOGICAL (Weight = 10%)

8. FIRE REGIME or WILDFIRE
1. Fire Condition Class OR
2. Wildfire Effects

9. FOREST COVER
1. Loss of Forest Cover

10. RANGELAND VEGETATION
1. Vegetation Condition

11. TERRESTRIAL INVASIVE SPECIES
1. Extent & Rate of Spread

12. FOREST HEALTH
1. Insects and Disease
2. Ozone

National attributes adapted for the Tongass

Classifying Individual Attributes

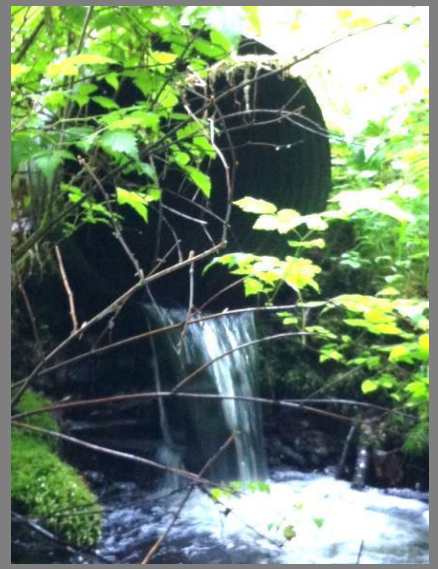
- Condition Rating 1 (Good): Watershed is functioning properly with respect to this attribute
- Condition Rating 2 (Fair): Watershed is functioning at risk with respect to this attribute
- Condition Rating 3 (Poor): Watershed is impaired or functioning at unacceptable risk with respect to this attribute

Aquatic Habitat Attribute

3.1 Habitat Fragmentation

amount of habitat upstream of culverts that restrict fish passage

Data: Fish stream crossing inventory (red pipes), upstream habitat assessments, GIS streams (Class I and II)

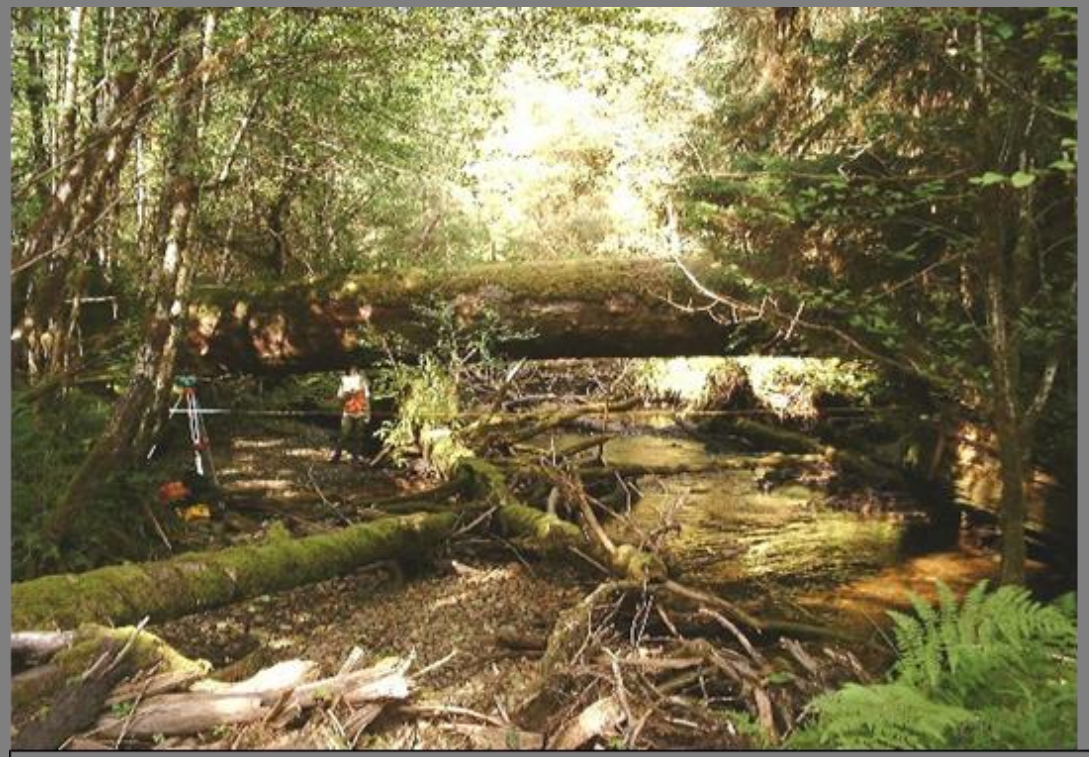


Watershed	1 < 5%	2 5-25%	3 > 25%	2015 score
Staney		6.3%		2
Game		7.6%		2
Pats		11.2%		2
Tongass distribution	*125+*	*43*	*1*	

Restoration actions to improve watershed condition would include replacing and removing culverts to restore fish access to upstream habitat.

Aquatic Habitat Attribute

3.2 Instream Large Wood Presence & Recruitment at Natural Rates



Properly Functioning

Not Properly Functioning

Tongass NF Biologists have measured statistical differences between stream habitat in un-managed streams (left) and stream habitat that has had intensive management (right).

Aquatic Habitat Attribute

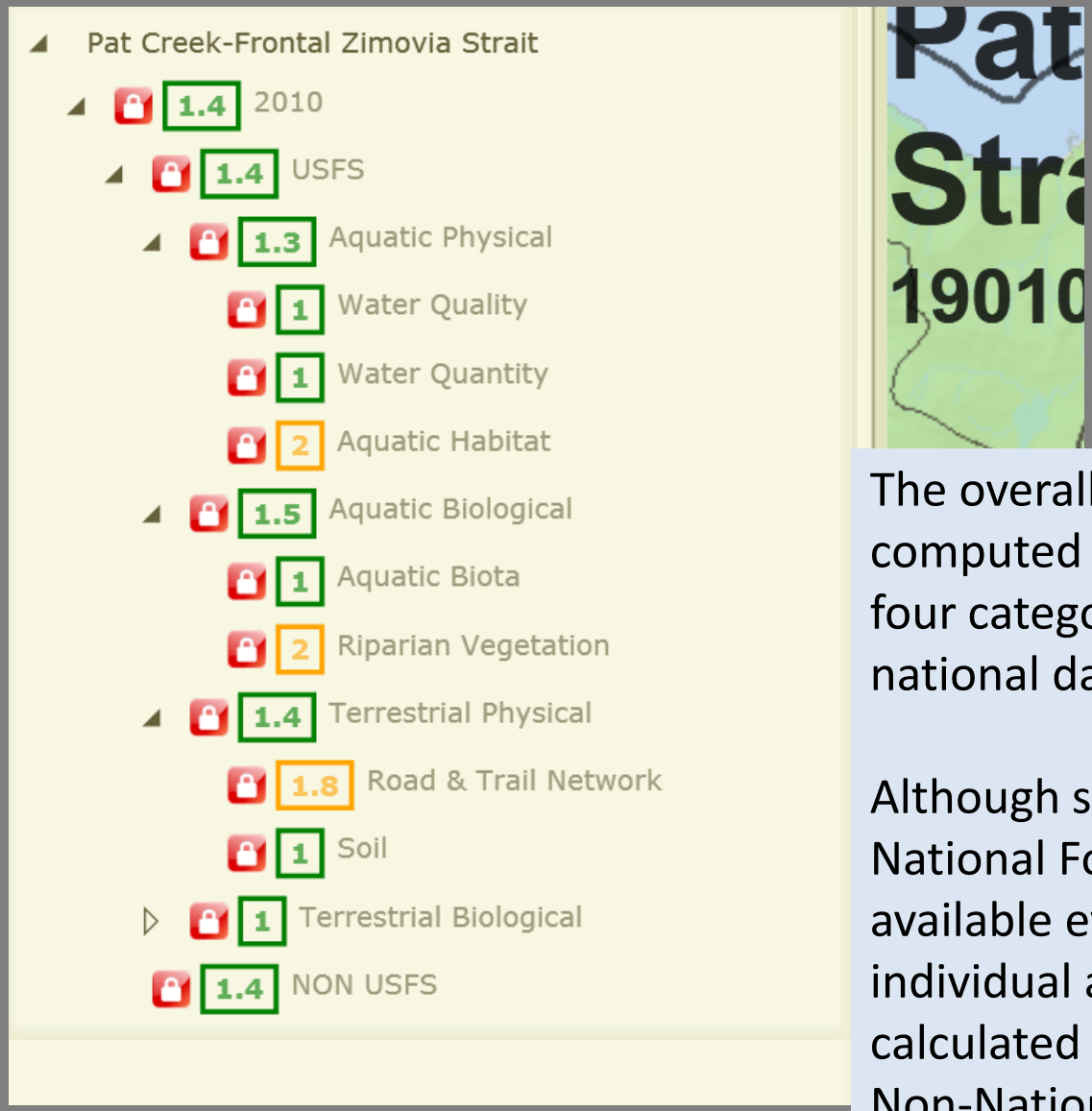
3.2 Instream Large Wood Presence & Recruitment at Natural Rates

Percent riparian area roaded or harvested adjacent to low gradient alluvial streams (most productive and sensitive fish habitat)

Data: GIS streams (FP, MM, AF), riparian, harvest, roads

Watershed	1 < 5%	2 5-25%	3 > 25%	2015 score
Staney			30.8%	3
Game		6.4%		2
Pats		6.6%		2
Tongass distribution	*127+*	*143*	*61*	

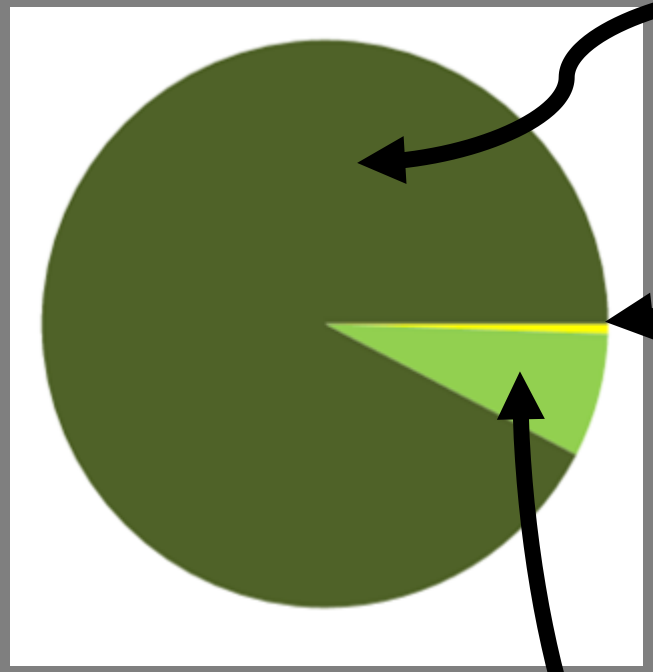
Restoration actions to improve watershed condition could include placement of wood in streams to restore habitat function, placement of wood on floodplains to restore floodplain function, and riparian young growth forest treatments to accelerate growth of big trees



The overall watershed condition score is computed as a weighted average of the four category scores, entered into a national database.

Although some data are available for non-National Forest lands, not all data are available everywhere. Therefore, individual attribute scores were not calculated for non-National Forest lands. Non-National Forest scores are typically assigned as ‘same/better/worse’ than National Forest.

Condition Class, 900 Tongass watersheds



Most Class 1 = Functioning Properly (score 1 – 1.6)

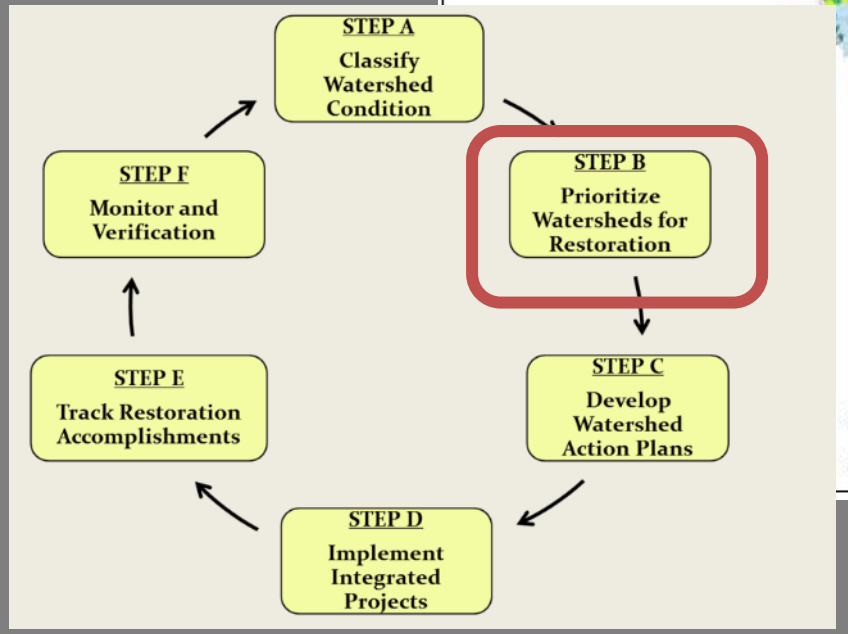
One Class 2 = Functioning at Risk (score 1.7 – 2.2)

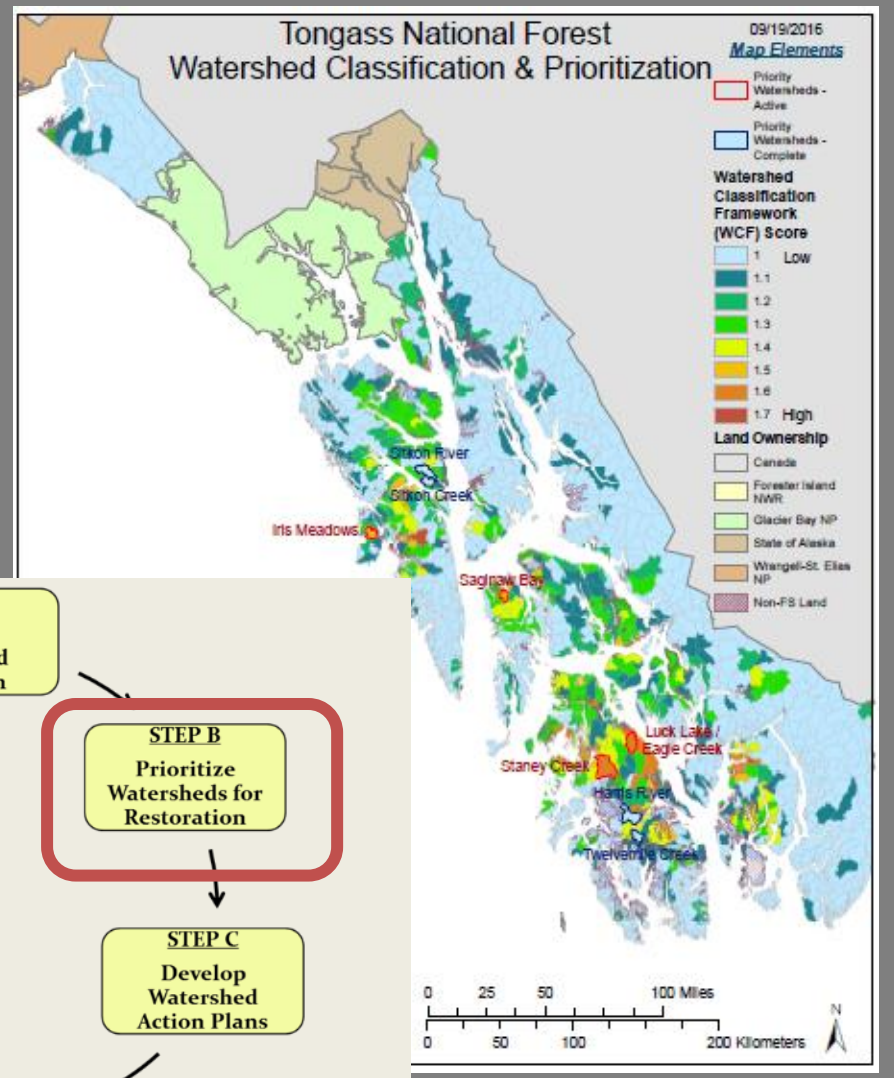
NO Class 3 = Impaired Function (score 2.3 -3)

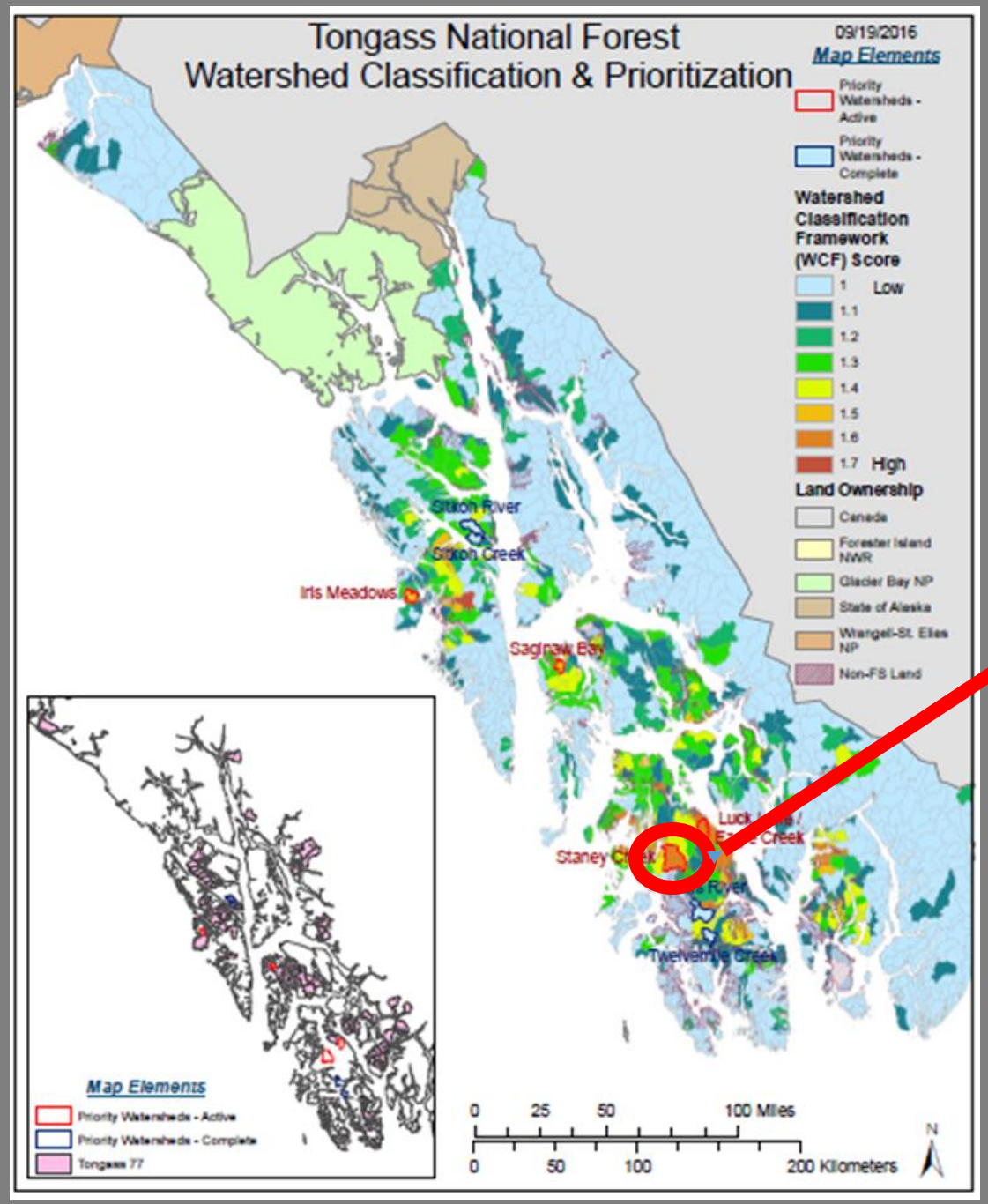
About 6% of Tongass watersheds score 1.4 to 1.6 and have known restoration needs

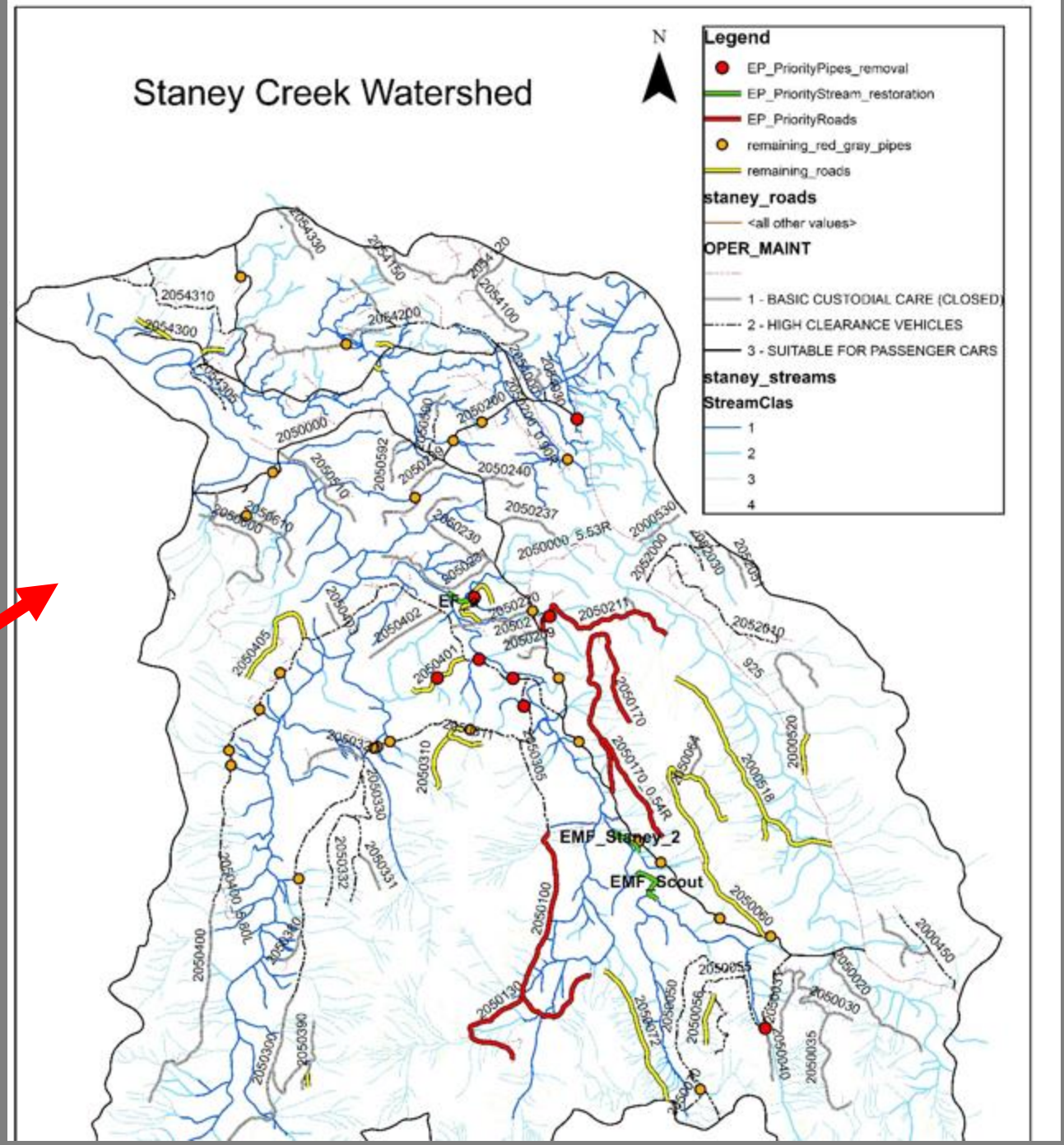
Identify Priority Watersheds for Restoration

- **Establish a small subset of priority watersheds for targeted improvement equivalent to a five year program of work**
- **Suites of essential restoration projects are completed in a watershed before work emphasis shifts to the next watershed**
- **Acting now will prevent continued decline of watershed condition**
- **Compared to lower 48, small investments have large impacts – our healthy salmon runs can immediately use restored habitat**

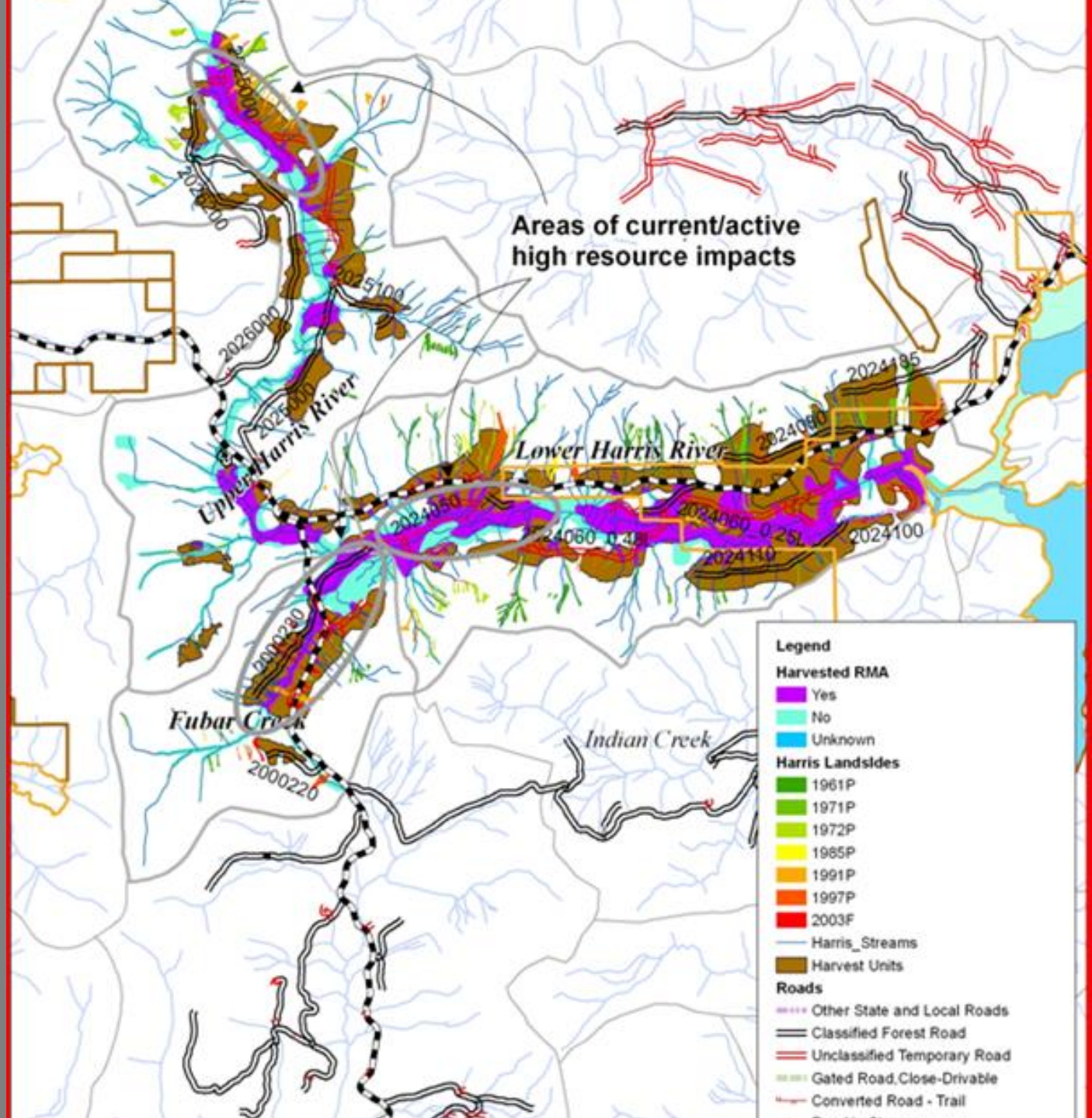




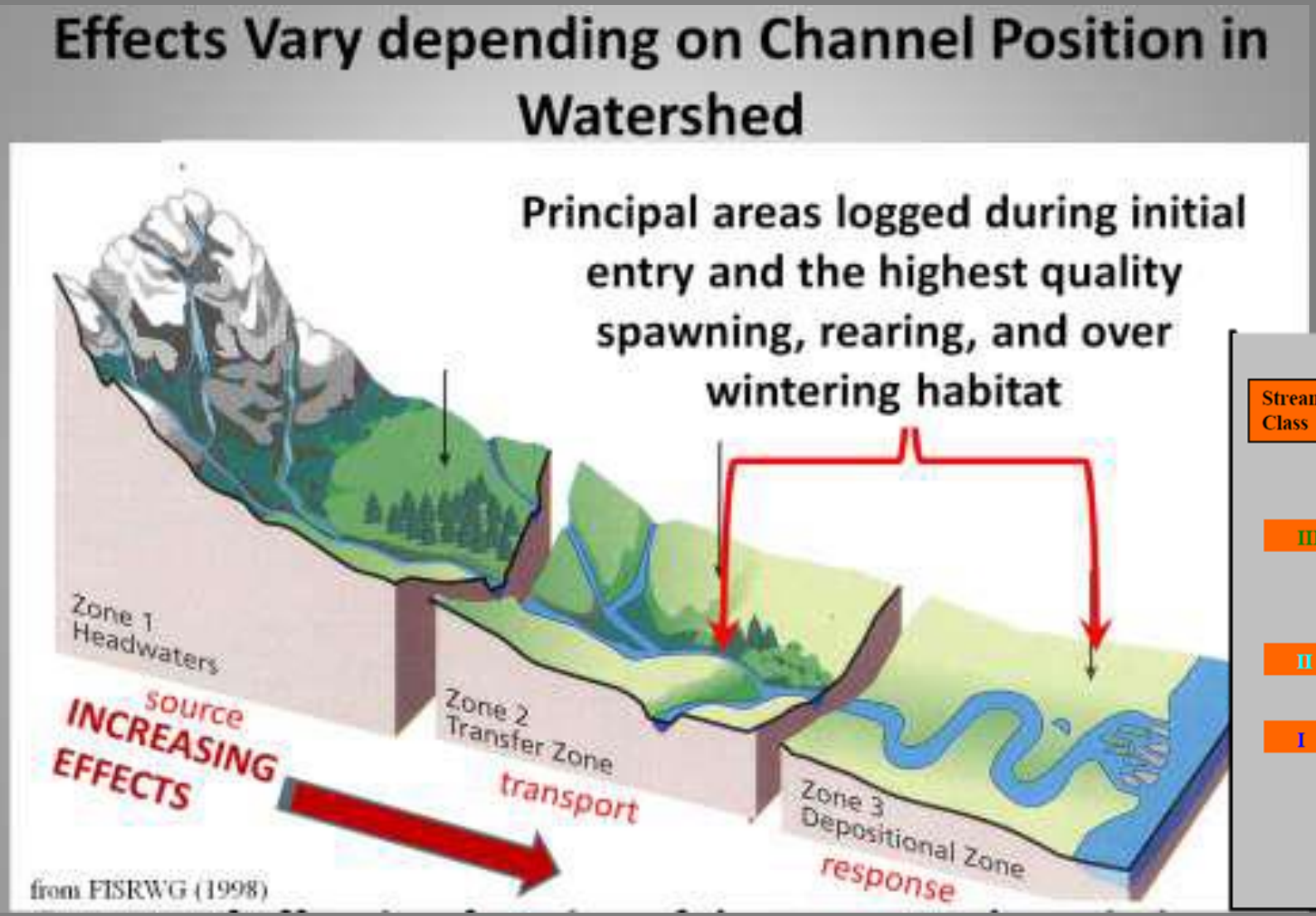

Tongass National Forest
Watershed Classification & Prioritization
09/19/2016
Map Elements
Priority Watersheds - Active
Priority Watersheds - Complete
Watershed Classification Framework (WCF) Score
1 Low
1.1
1.2
1.3
1.4
1.5
1.6
1.7 High
Land Ownership
Canada
Forester Island NWR
Glacier Bay NP
State of Alaska
Wrangell-St. Elias NP
Non-FS Land
Stikine River
Stikine Creek
Iris Meadows
Saginaw Bay
Staney Creek
Twelvemile Creek
Map Elements
Priority Watersheds - Active
Priority Watersheds - Complete
Tongass 77
0 25 50 100 Miles
0 50 100 200 Kilometers
N

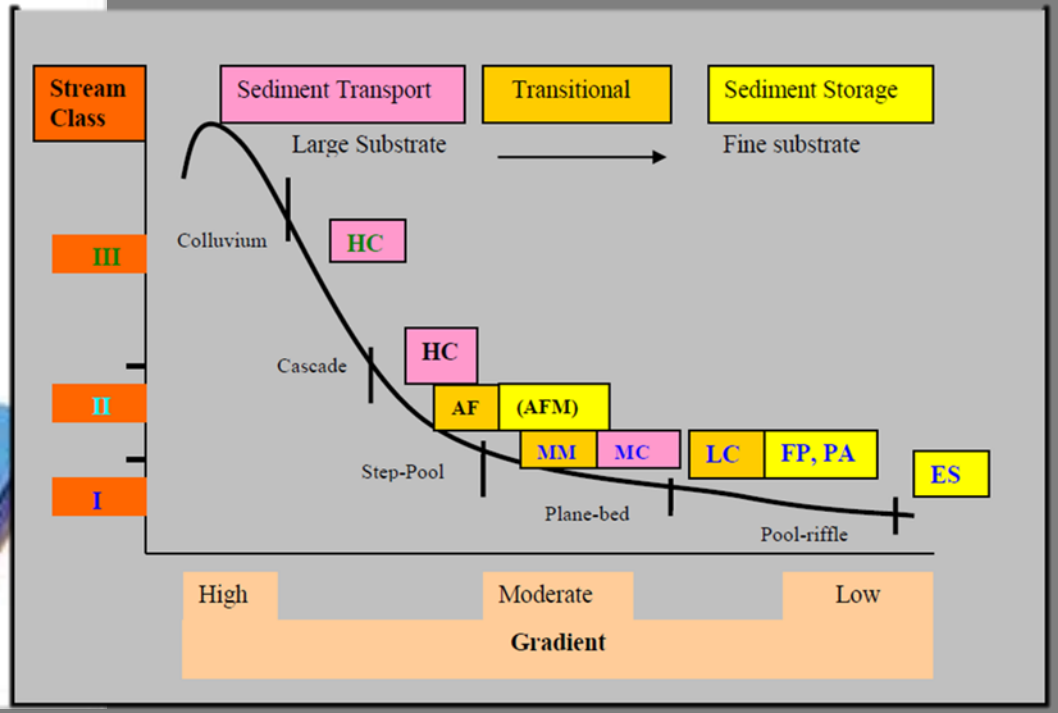

Staney Creek Watershed
N
Legend
EP_PriorityPipes_removal
EP_PriorityStream_restoration
EP_PriorityRoads
remaining_red_gray_pipes
remaining_roads
staney_roads
<all other values>
OPER_MAINT
1 - BASIC CUSTODIAL CARE (CLOSED)
2 - HIGH CLEARANCE VEHICLES
3 - SUITABLE FOR PASSENGER CARS
staney_streams
StreamClas
1
2
3
4
EMF_Staney_2
EMF_Scout

Watershed Scale Assessment



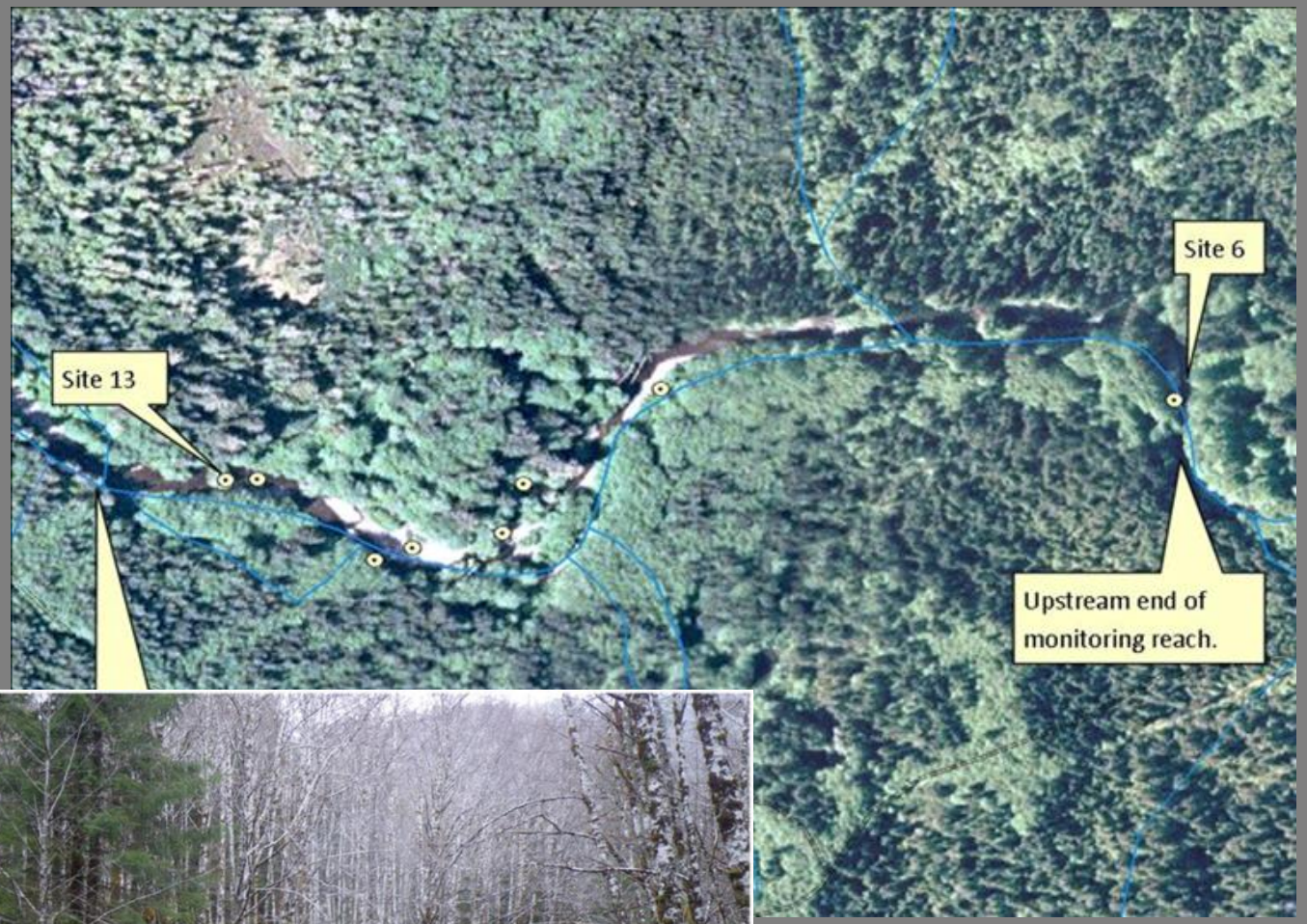
Watershed Scale Assessment





Watershed Scale Assessment

- Streams and Floodplains
- Riparian Forest



Watershed Scale Assessment

- Streams and Floodplains
- Riparian Forest

Properly Functioning

Not Properly Functioning

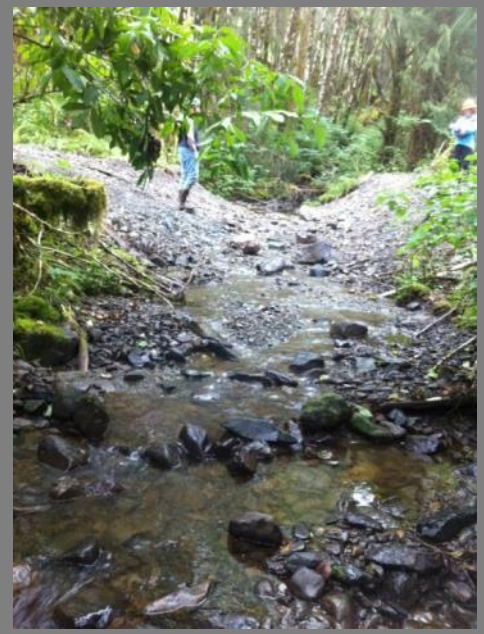
Watershed Scale Assessment

- Roads
- Landslides

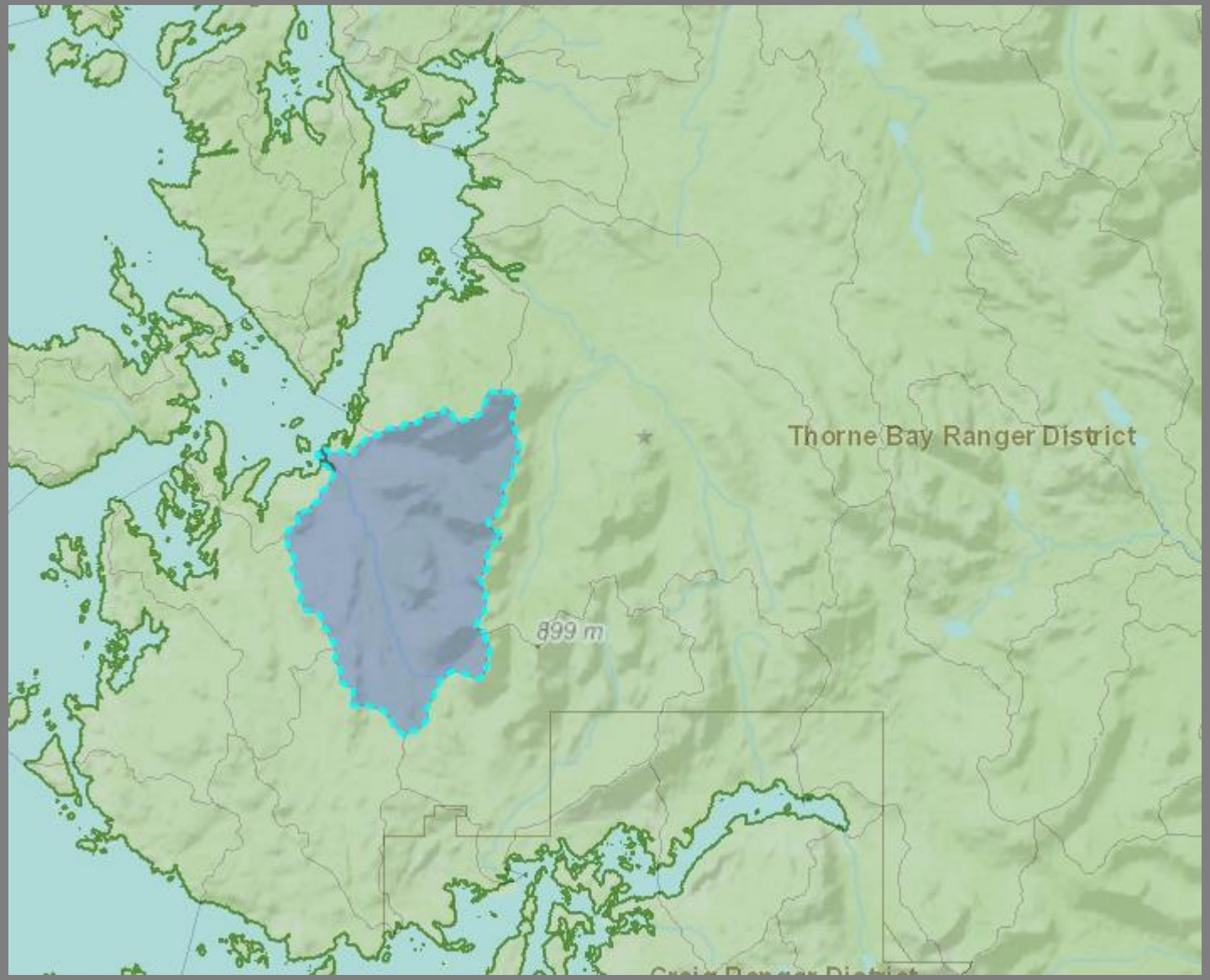
Watershed Scale Assessment

- Roads

Restoration Completed in Harris River, Sitkoh River, Sitkoh Creek, and Twelvemile Creek



Restoration in Progress in Staney Creek, Iris/Shelikof Creek, Saginaw Creek, Luck/Eagle Creek

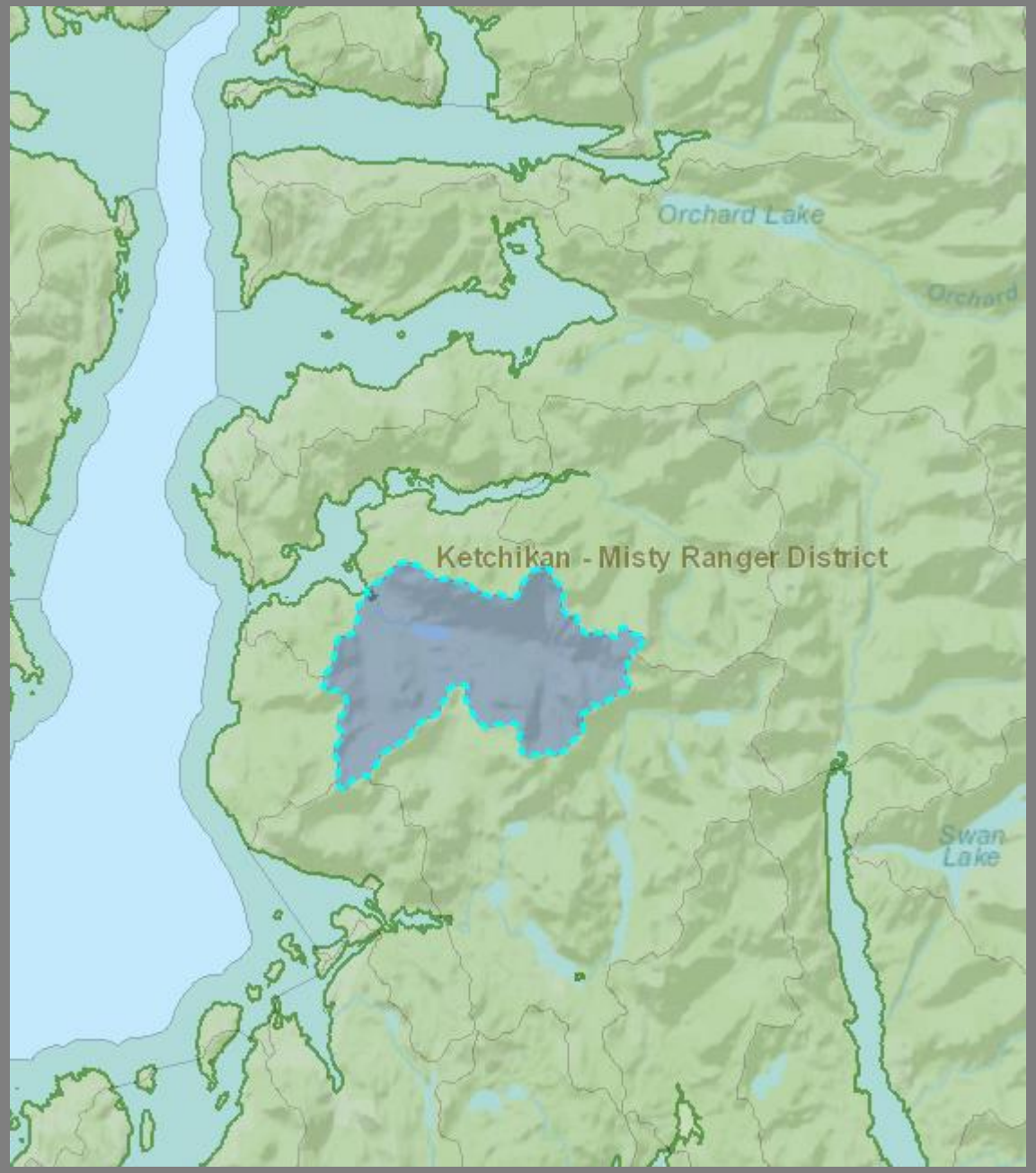


New Priority Watershed:

Shaheen Creek

- Aquatic Habitat
- Riparian
- Roads and Fish Passage

Community and partner support



New Priority Watershed:

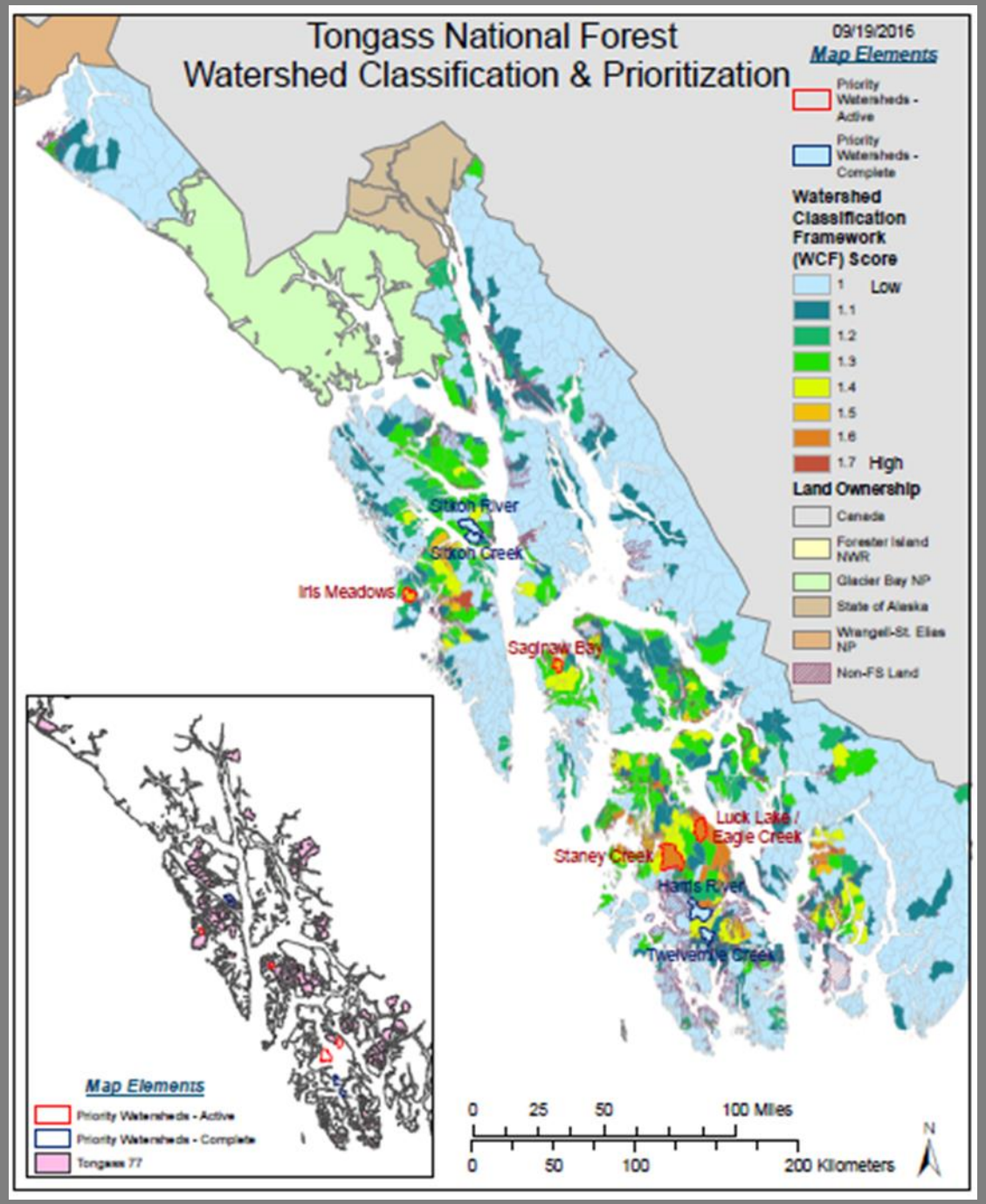
Margaret Creek

Action Plan drafted

- Aquatic Habitat
- Riparian
- Roads and Fish Passage

Integrate with out year recreation/timber/roads

Integration!



Successes

- Alignment with partners and stakeholders
- Access

Challenges

- Changes in stakeholder expectations
- Mobilization costs
- Wood sources