Apr 4th, 4:00 PM - 4:15 PM

Using a watershed approach to identify protection and restoration actions in the Blackjack Creek watershed, Kitsap County, Washington

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A Watershed Approach to Identify Protection and Restoration Actions - Blackjack Creek, Kitsap Peninsula (WA)

Steve Todd, Suquamish Tribe
Ilon Logan, ESA

Salish Sea Ecosystem Conference

April 4, 2018

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Blackjack Watershed Assessment

- Blackjack is 1 of 3 “high priority refugia” watersheds for salmonids on Kitsap Peninsula (Chico, Curley). All completed watershed restoration plans.
- Productive, relatively intact habitat for multiple salmonid species.
- Accelerating land use pressures (UGAs)
- Blackjack Watershed Restoration Plan ID’d as NTA (Puget Sound Action Agenda).

Goal:

- Develop a Watershed Protection and Restoration Plan that addresses watershed processes and habitat functions for salmonids.
- ID pressures/stressors that impact salmonid habitat, and processes that maintain functions, including resilience to changes (flows/temp. associated with land use and climate).

Partners, Stakeholders, and Funding

Project Partners:

- Kitsap County
- City of Port Orchard

Key Stakeholders:

- Multiple landowners
- Kitsap Conservation District
- Great Peninsula Conservancy
- West Sound Watersheds Council
- Washington Dept. of Ecology
- Washington Dept. Fish & Wildlife

Funding:

- National Estuary Program
- Puget Sound Tribal Capacity Grant

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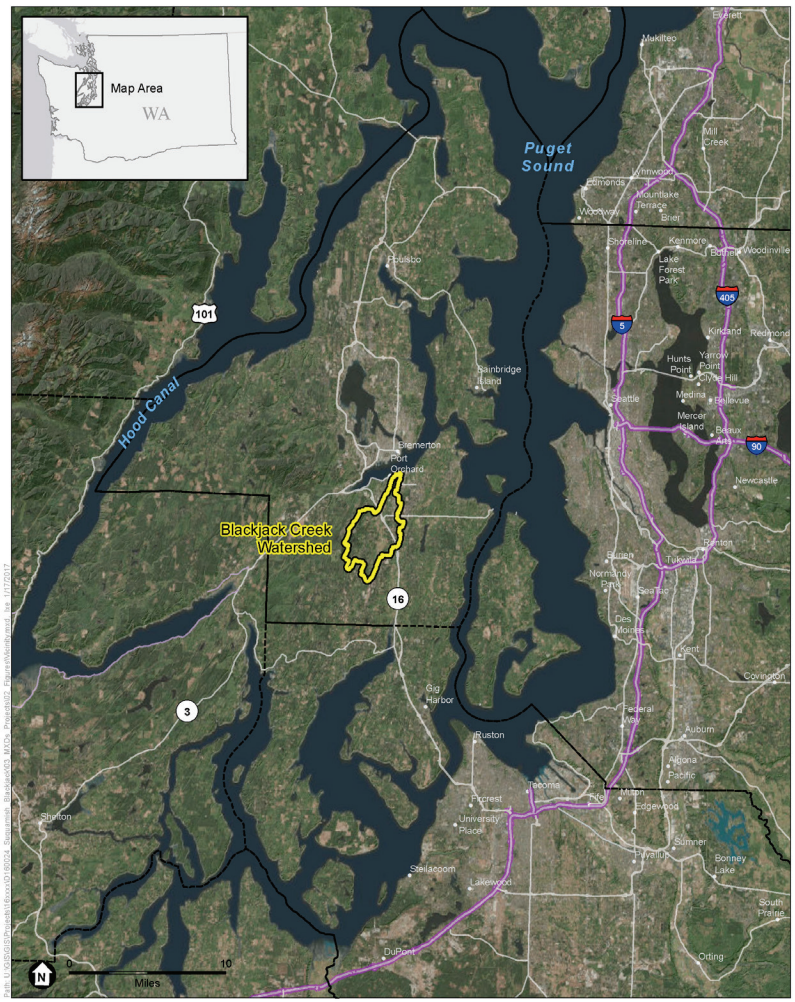
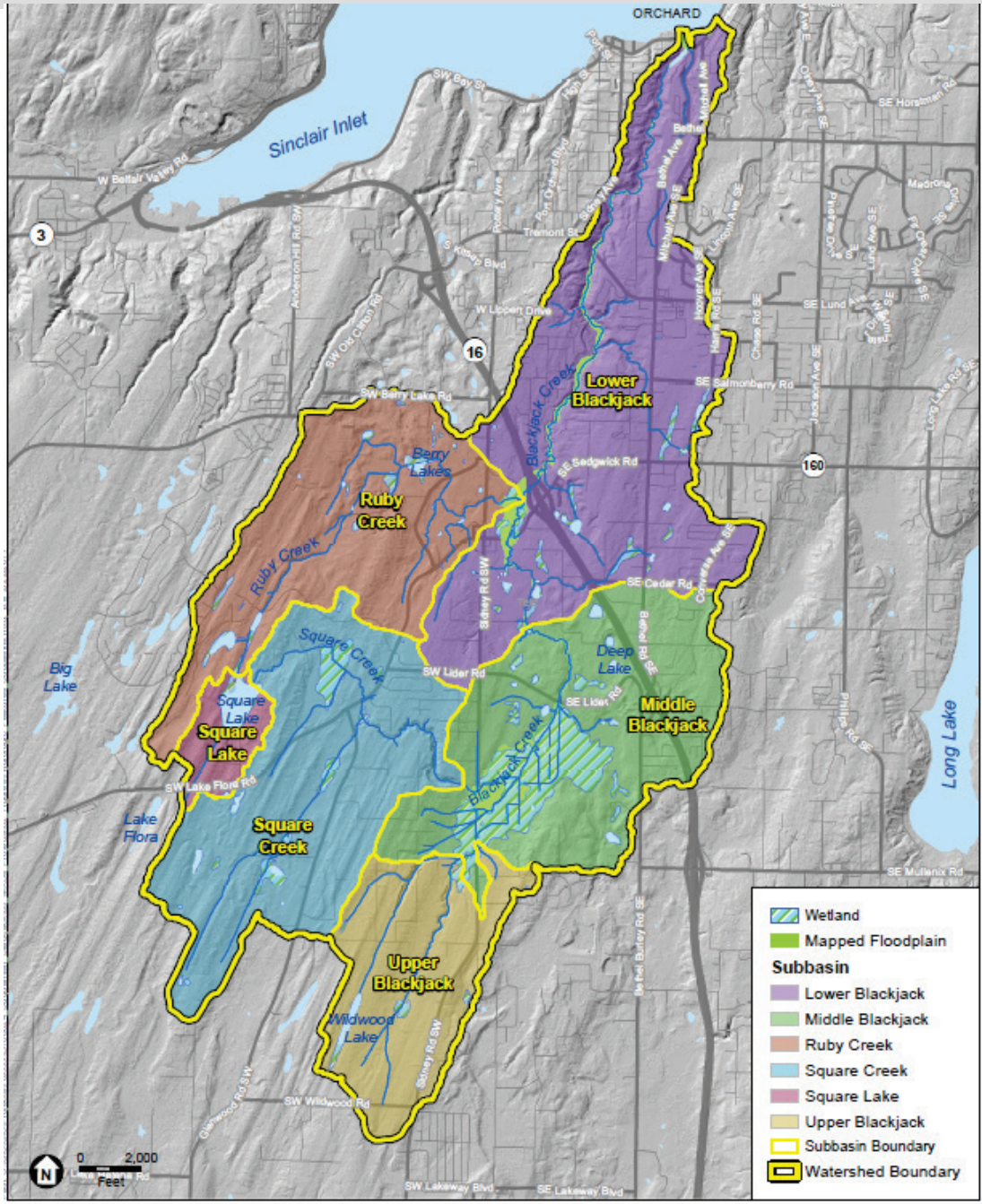
Blackjack Creek Watershed and Subbasins

- 12.3 square miles
- Rain/GW driven system

>17 miles salmonid habitat





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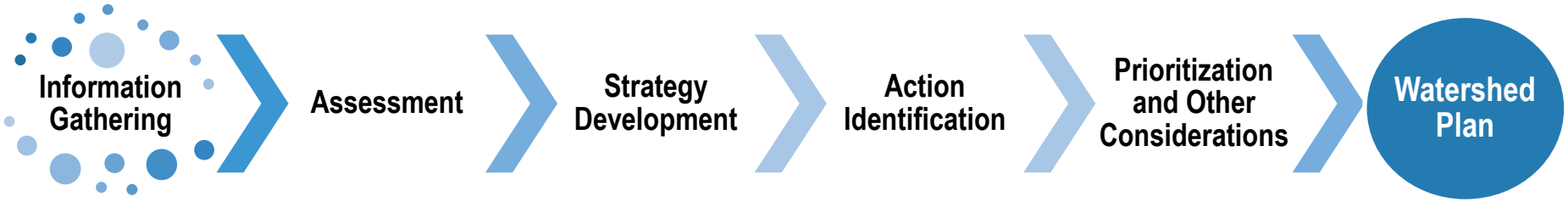
Building a Watershed Plan for Protection and Restoration



- Data and Reference List
- Watershed Tour (March 2016)
- Synthesis of Existing Data and Reports (Sept 2016)

- Workshop #1 (April 2017)
- Key Ecological Attributes and Pressures Assessment (June 2017)

- Review KEA and Pressure Summary and Spatial Data
- List of 13 Strategies and Sub-Strategies

- Reviewed previous lists
- Limited site visits
- List of 46 Actions to Address Strategies
- Recommended Strategies and Actions Memo (Sept 2017)
- Workshop #2 (Nov 2017)

- Process-based Priorities
- Landscape Considerations
- Biological Benefits
- Climate Change Considerations

- Strategies
- Results Chains
- Actions
- Prioritization Framework for Actions
- Potential Monitoring Indicators
- Data Gaps and Recommend Future Work

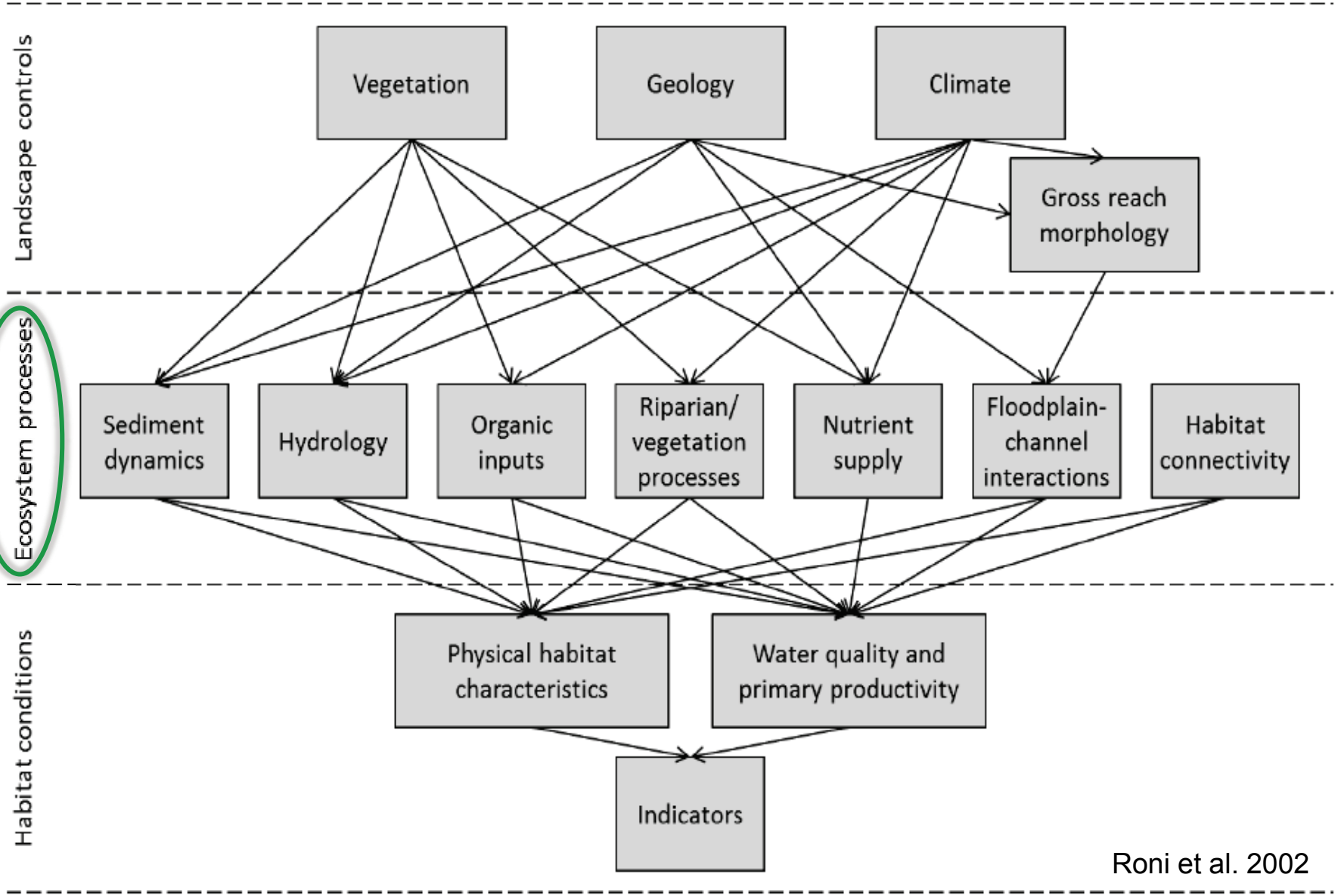
Watershed Tour

- Attended by project team, project partners and stakeholders
  - Suquamish Tribe, Kitsap County, City of Port Orchard, West Sound Watersheds Council, Washington Department of Fish and Wildlife, Kitsap Conservation District, Great Peninsula Conservancy
- Visited key locations throughout watershed; met with landowners
- Summary notes, maps, and photos
- Critical to developing overall understanding of watershed

Key Ecological Attributes (KEA) and Pressures Assessment - report

- Synthesis of existing data
- Applied 'Open Standards' framework (Puget Sound/Chinook Recovery)
  - Ecosystem Components (e.g., Channels, Floodplains, Wetlands, salmonid spp.)
  - Key Ecosystem Attributes (e.g., Hydrology, Sediment, Riparian, Floodplain, population size)
- Describes current conditions
- Identifies human pressures and degradation of KEAs
- GIS mapping and spatial data analysis
- KEA/Pressures Assessment provided foundation for developing protection/restoration strategies and actions

KEA and Pressures Assessment



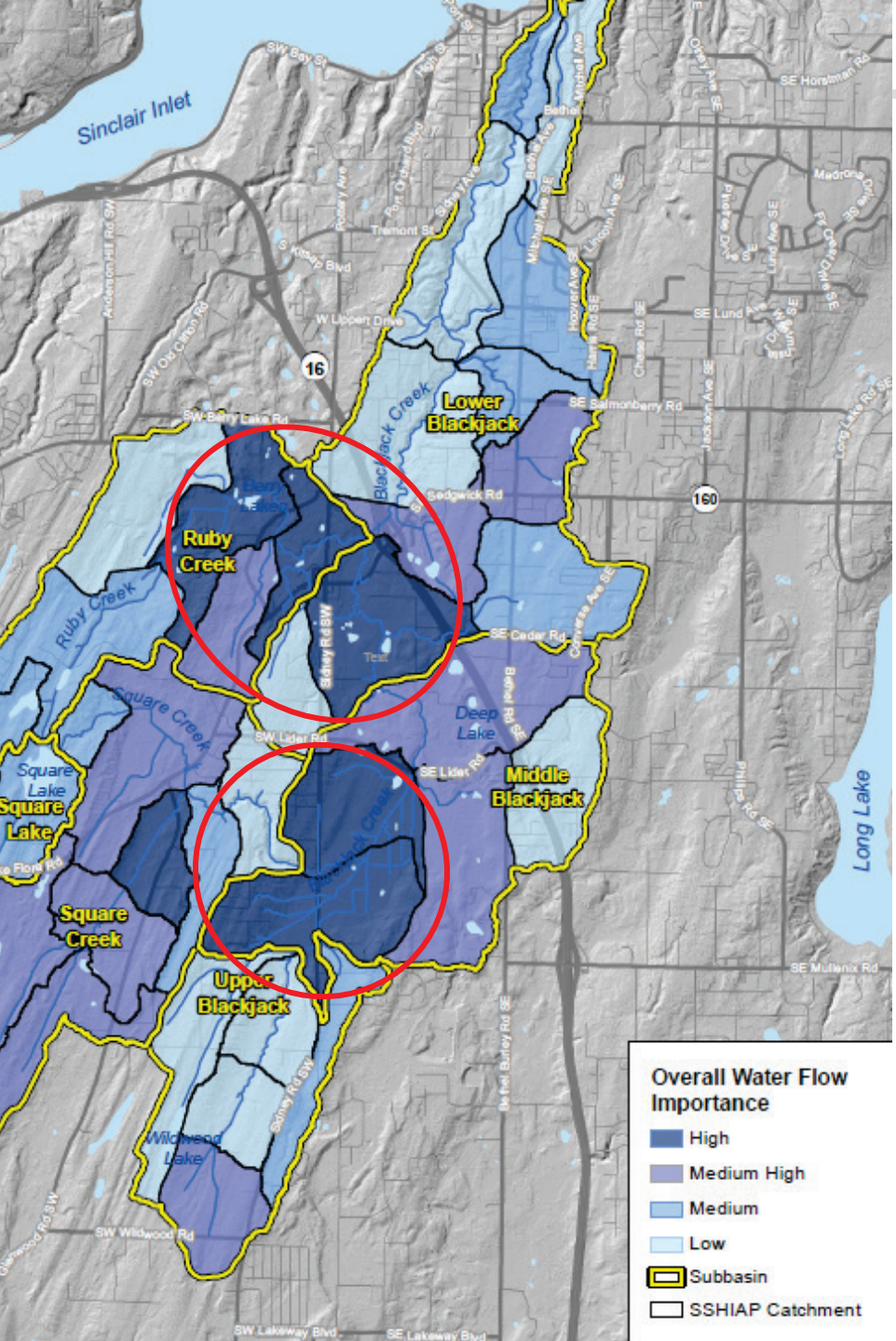
Roni et al. 2002

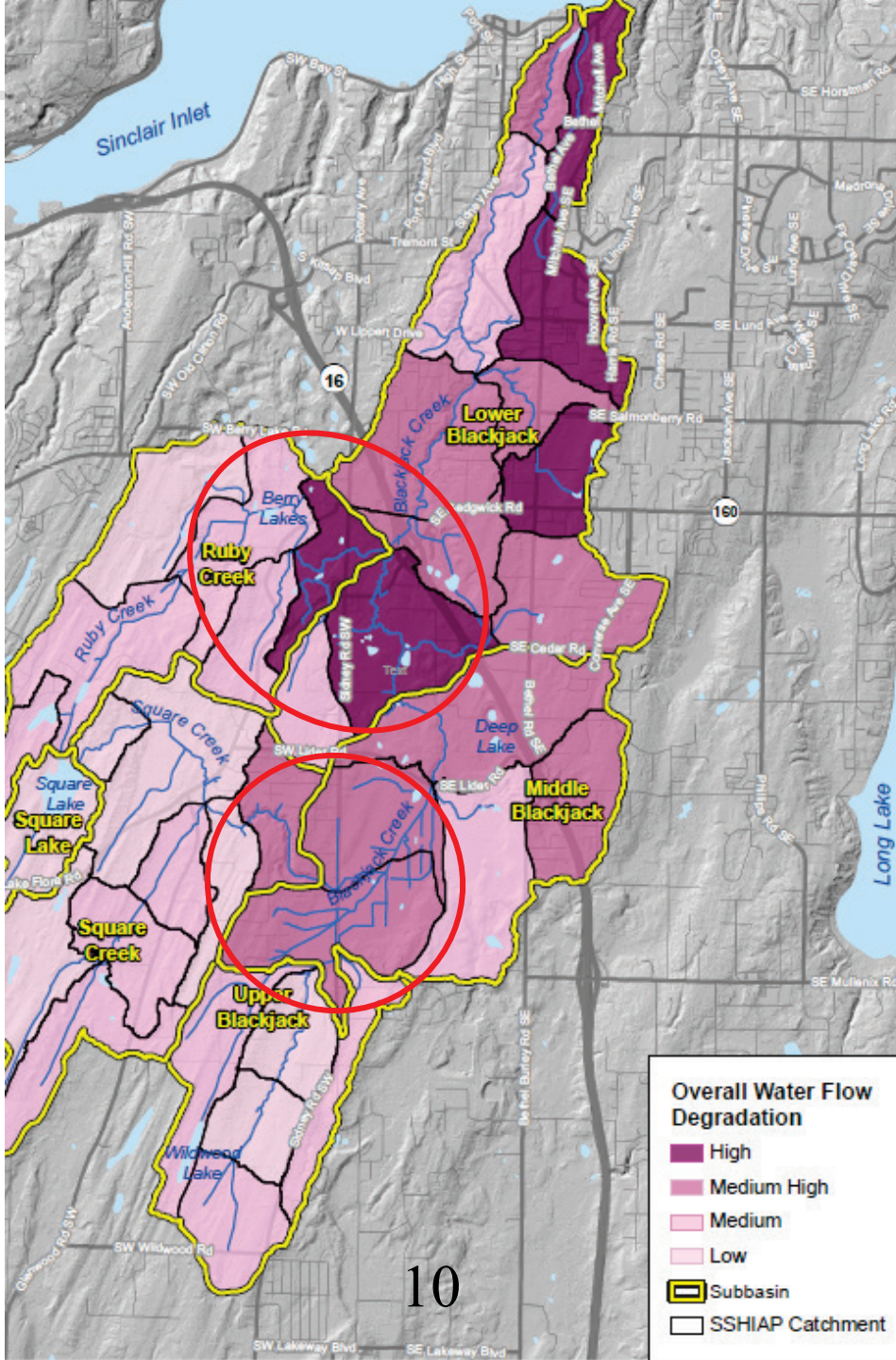
Hydrologic Regime – landscape scale

- Puget Sound Watershed Characterization (Ecology) – Water Flow and Water Quality Assessments
- 5 Assessment Units (derived from SSHIAP)
- 36 Project Assessment Units (PAUs) or catchments

Maps and model output tables by catchment:

- Overall Water Flow Importance
- Overall Water Flow Degradation (impervious)
- Surface Storage (wetlands, lakes, floodplains)
- Groundwater Recharge (soil permeability)
- Groundwater Discharge (slope breaks)


Sinclair Inlet
Lower Blackjack
Ruby Creek
Middle Blackjack
Square Creek
Upper Blackjack
Deep Lake
Square Lake
Long Lake
Overall Water Flow Importance
High
Medium High
Medium
Low
Subbasin
SSHIAP Catchment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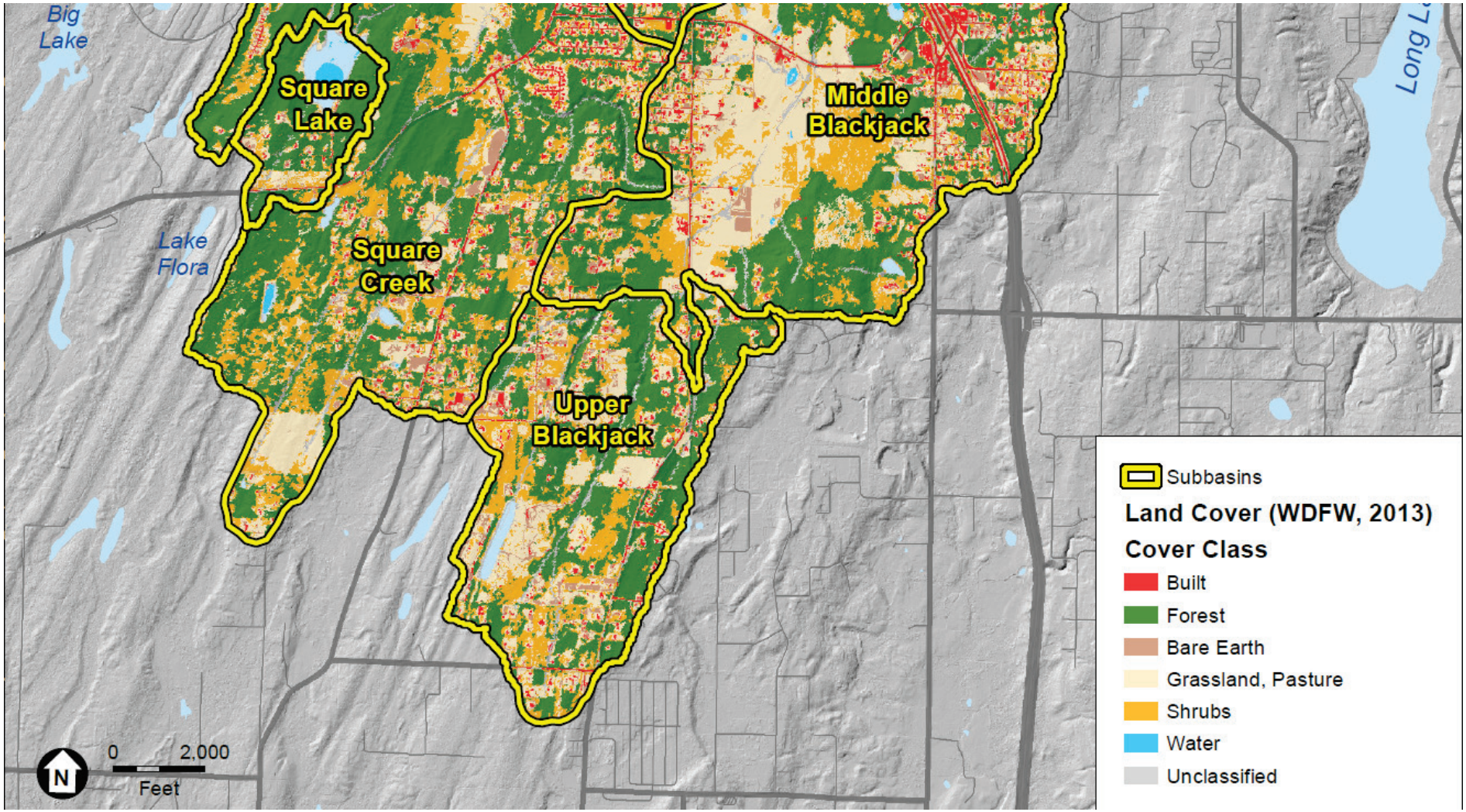
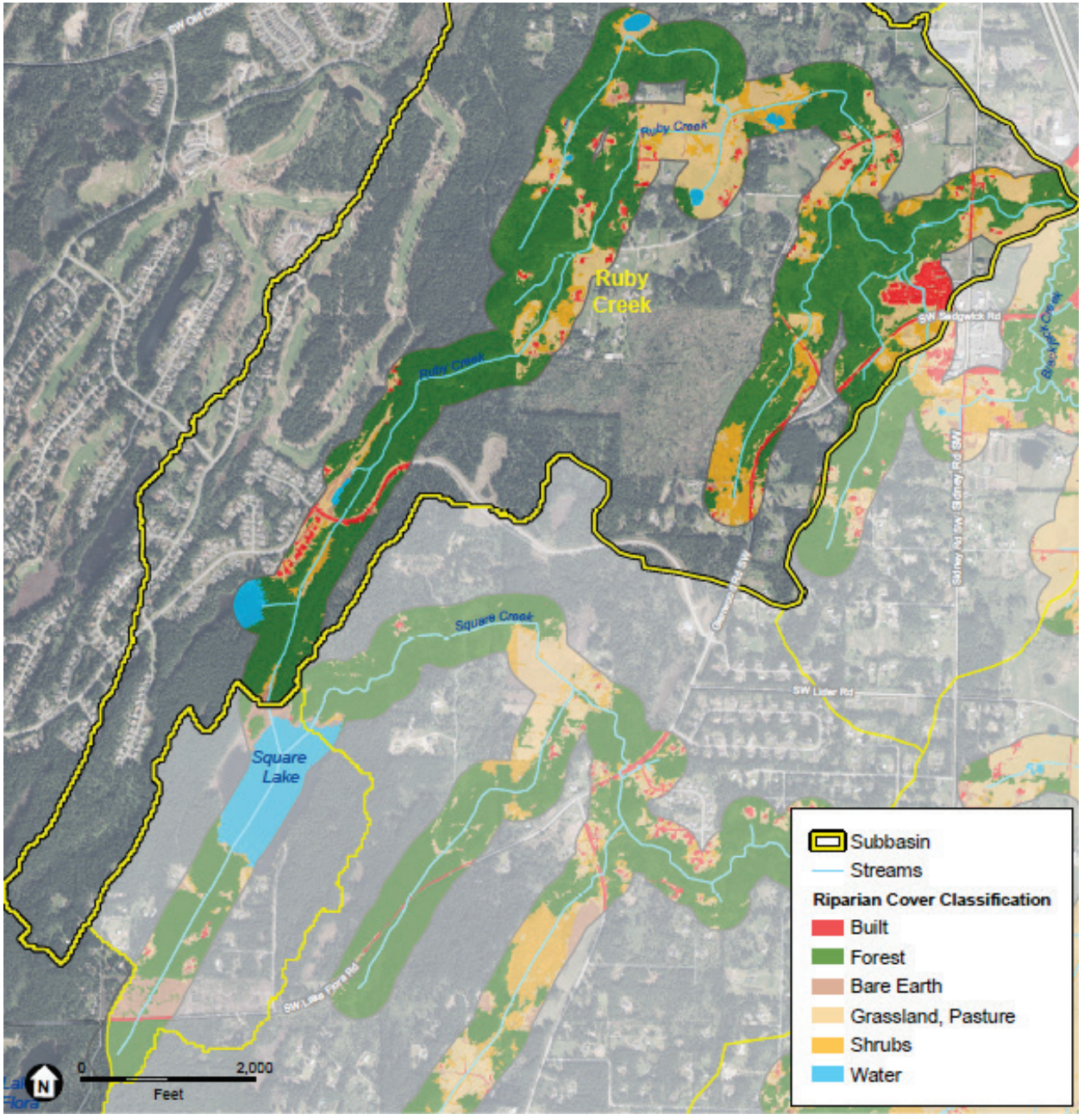
Hydrologic Regime – Land Cover



Riparian Areas and Wetlands

- Riparian cover by subbasin
  - WDFW High Resolution Land Cover (2013)
  - 2015 Aerial Imagery – air photo interpretation
  - 1,000-foot wide corridor
  - Land cover classes and amounts (%)
- Wetland cover by subbasin
  - Kitsap County (2006)
- Additional review of aerial imagery
- Limited field reconnaissance

Riparian Conditions by Subbasin - *Ruby Creek example*

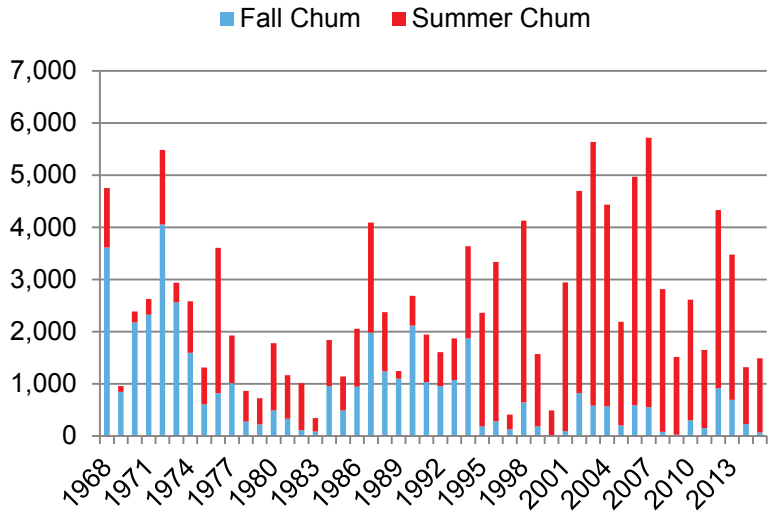


Estuary Condition

- Early survey maps (1858, 1881) and air photos (1940)
- Significant fill of historic intertidal area
- Main limiting factor for salmonid productivity?

Salmonid Distribution & Population Status

- Life History, Abundance, and Distribution
  - Chum (distinctive summer and fall runs)
  - Coho
  - Steelhead (ESA listed)
  - Chinook salmon and coastal cutthroat trout
- Available databases (Suquamish/WDFW)
- Water typing/fish presence (Wild Fish Conservancy)
- Personal communications



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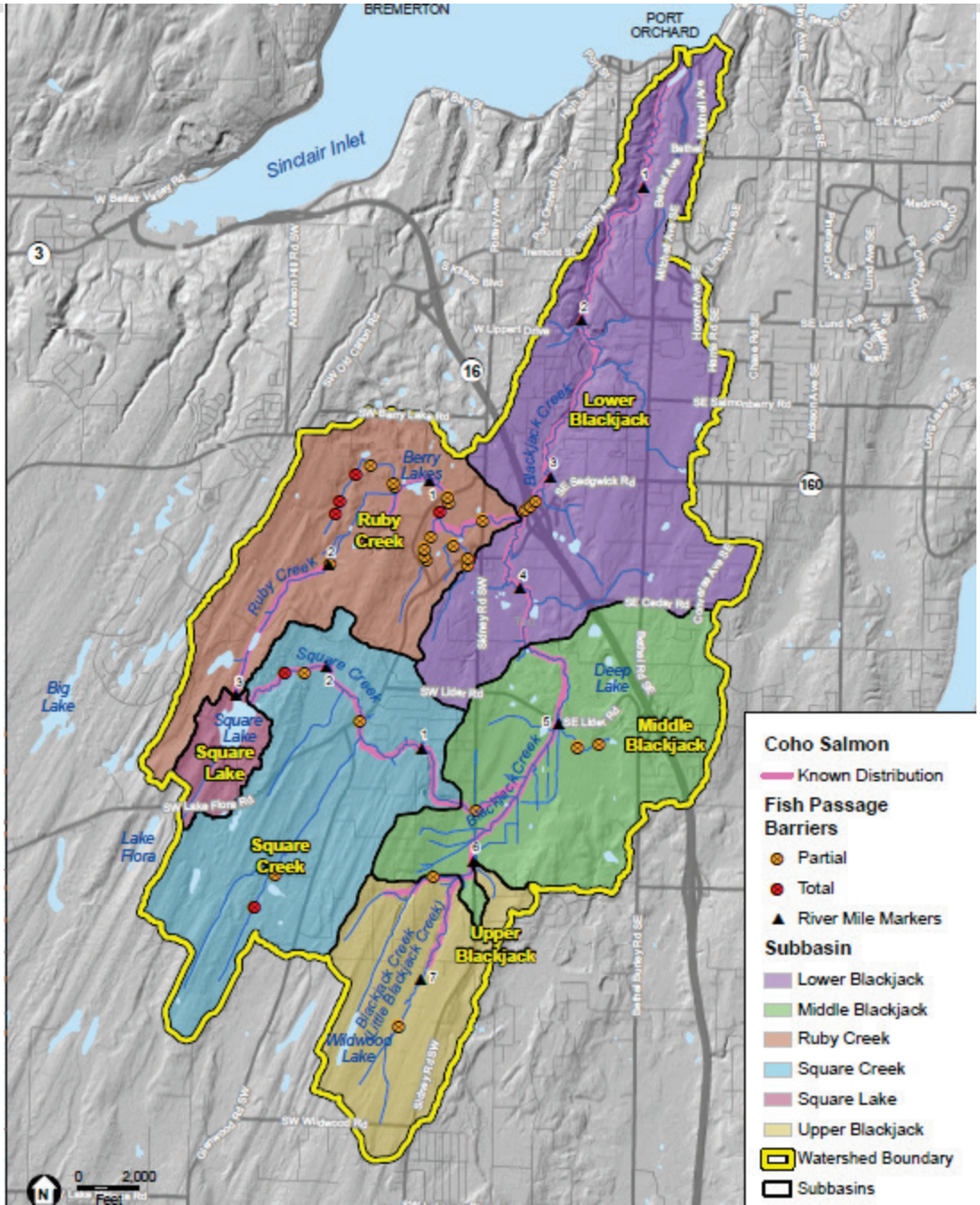
Salmonid Abundance and Distribution - Coho



Reach-Scale Evaluations

- Assessment used existing data and limited field reconnaissance
- Rating watershed processes/KEAs:
  - Functioning – Minimal impacts on habitat-forming processes/indicators
  - Impaired – Substantial human impacts on processes/indicators
  - Moderately impaired – Impacted, but retain some natural potential
- Results informed protection/restoration strategies and actions

Reach	River Mile or Location	Confinement (*artificial)	Watershed Processes and Key Ecological Attributes								
			Hydrologic Regime	Sediment Regime	Riparian Areas and Wetlands	Organic Matter Inputs	Nutrient Supply	Floodplain Channel Interactions	Habitat Connectivity	Fish Passage	Water Quality
Lower Blackjack Creek											
Estuary	0.0/Mouth	Confined*	Moderately Impaired	Moderately Impaired	Impaired	Impaired	Moderately Impaired	N/A	Impaired	Functioning	Functioning
Lower Mainstem	RM 0.0–3.2	Confined	Functioning	Functioning	Functioning	Moderately Impaired	Functioning	Functioning	Functioning	Functioning	Functioning
Upper Mainstem	RM 3.2–4.3	Moderately Confined	Moderately Impaired	Moderately Impaired	Moderately Impaired	Moderately Impaired	Functioning	Moderately Impaired	Moderately Impaired	Functioning	Functioning
Tributaries		Confined*	Impaired	Impaired	Impaired	Impaired	Impaired	Impaired	Impaired	Moderately Impaired	Functioning
Middle Blackjack Creek											
Lower Reaches	RM 4.3–5.0	Confined*	Moderately Impaired	Moderately Impaired	Moderately Impaired	Moderately Impaired	Moderately Impaired	Moderately Impaired	Moderately Impaired	Functioning	Functioning
Middle Reaches	RM 5.0–5.9	Unconfined (some artificial)*	Impaired	Impaired	Impaired	Impaired	Impaired	Impaired	Moderately Impaired	Functioning	Functioning
Upper Reaches	RM 5.9–6.1	Unknown	Moderately Impaired	Moderately Impaired	Functioning	Functioning	Functioning	Moderately Impaired	Moderately Impaired	Functioning	Moderately Impaired
Ruby Creek											
Lower Reaches	RM 0.0–0.7	Moderately Confined*	Moderately Impaired	Moderately Impaired	Moderately Impaired	Moderately Impaired	Moderately Impaired	Moderately Impaired	Moderately Impaired	Impaired	Functioning
Middle Reaches	RM 0.7–2.0	Moderately Confined*	Impaired	Impaired	Impaired	Impaired	Impaired	Impaired	Moderately Impaired	Impaired	Functioning
Upper Reaches	RM 2.0–Square Lake	Unconfined	Functioning	Functioning	Functioning	Functioning	Functioning	Functioning	Moderately Impaired	Moderately Impaired	Functioning
Square Creek											
Mainstem	Sidney Rd–Square Lake	Moderately Confined*	Moderately Impaired	Moderately Impaired	Moderately Impaired	Moderately Impaired	Moderately Impaired	Moderately Impaired	Functioning	Moderately Impaired	Functioning
Tributaries	East & West	Unconfined	Functioning	Functioning	Moderately Impaired	Moderately Impaired	Functioning	Moderately Impaired	Functioning	Moderately Impaired	Functioning
Square Lake											
Lake (no streams)	Square Lake	N/A	N/A	N/A	Functioning	Functioning	Functioning	N/A	Functioning	Functioning	Unknown
Upper Blackjack Creek											
Mainstem	RM 6.0–7.5	Unconfined	Functioning	Functioning	Functioning	Unknown	Functioning	Functioning	Functioning	Moderately Impaired	Moderately Impaired
Tributaries	West (2)	Unconfined	Functioning	Functioning	Functioning	Functioning	Functioning	Functioning	Functioning	Functioning	Functioning

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Middle Blackjack Creek Subbasin

Multiple Impaired or Mod. Impaired watershed processes

Functioning fish passage

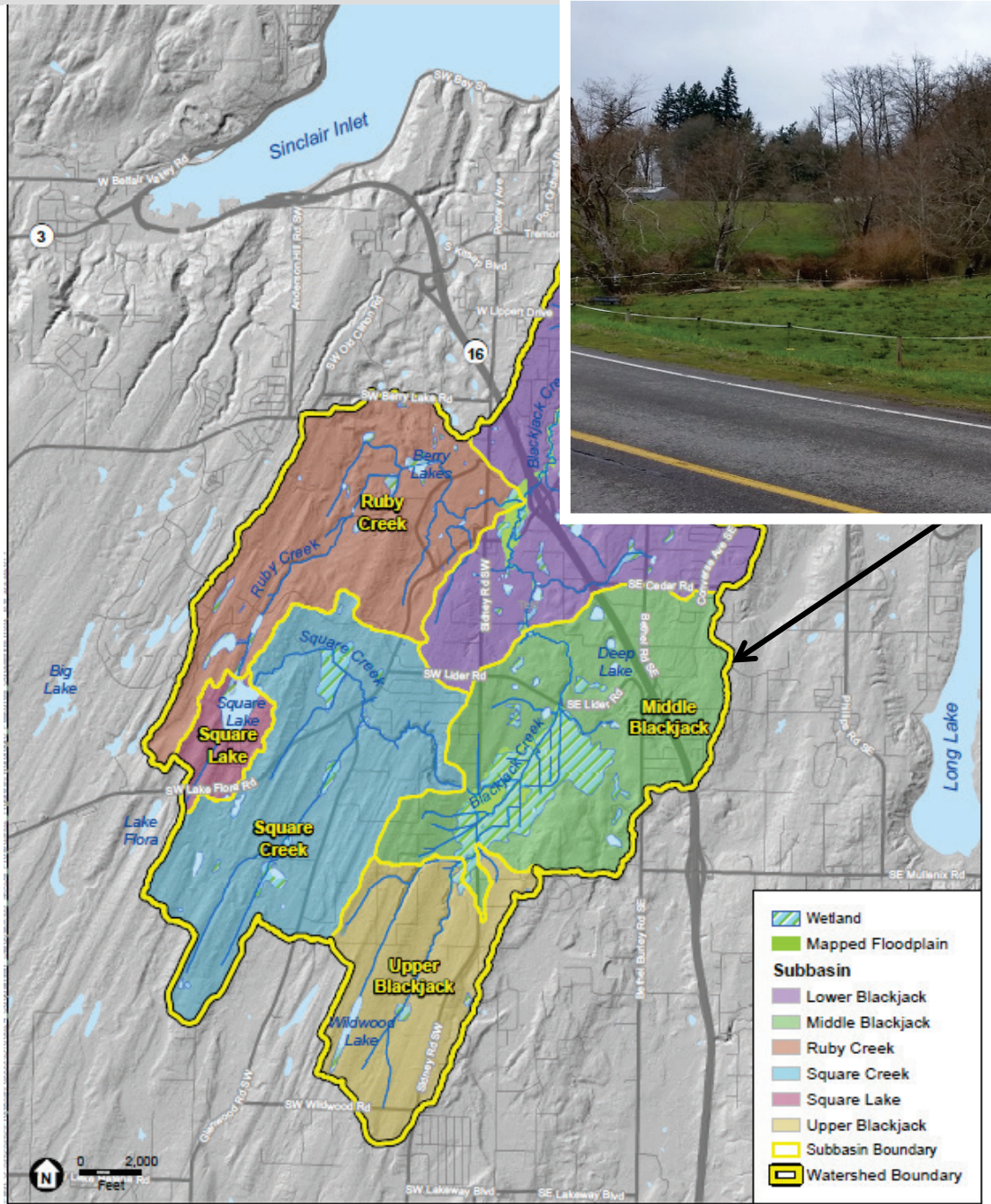
Focus Restoration:

Wetlands/floodplain

Riparian

LWD placement

Review commercial zoning



Watershed Plan (ESA, 2017)

- Summary of the watershed assessment findings
- 13 strategies for addressing functioning and degraded watershed processes
- 46 protection/restoration actions (*several proposed NTAs)
- Step-wise framework (protect, reconnect, restore, enhance)
- Considerations for prioritizing actions (e.g., biological benefits, climate change)
- Data gaps and recommendations for future work

Strategies

Protection	Restoration
P1. Protect Blackjack Creek habitat conditions	**R1.** Reconnect isolated habitats and remove barriers to fish passage
P1.1 Acquisitions and conservation easements	**R2.** Restore wetland and floodplain storage processes
P1.2 Improve compliance and/or strengthen land use regulations	**R3.** Remove constraints to lateral connectivity
P1.3 Protect and improve understanding of in-stream low flow conditions	**R3.1** Riverine
	R3.2 Tidal
	R4. Restore riparian processes
	R5. Place in-channel large woody debris
	R6. Improve habitat conditions within/adjacent to agricultural lands
	R7. Improve/retrofit stormwater attenuation capacity and treatment within/adjacent to developed areas
	R8. Debris Prevention and Removal
	R9. Public Involvement

Actions in Ruby Creek Subbasin

RC1-Protect Riparian Habitat

RC2-Review Existing Zoning

RC3-Restoration of Ruby Creek Upstream of Wildlife Preserve

RC4- Fish Passage Improvements @ Sidney Road

RC5-Fish Passage Improvements and Restoration downstream of Glenwood Road

RC6-Fish Passage Improvements and Restoration downstream of Glenwood Road

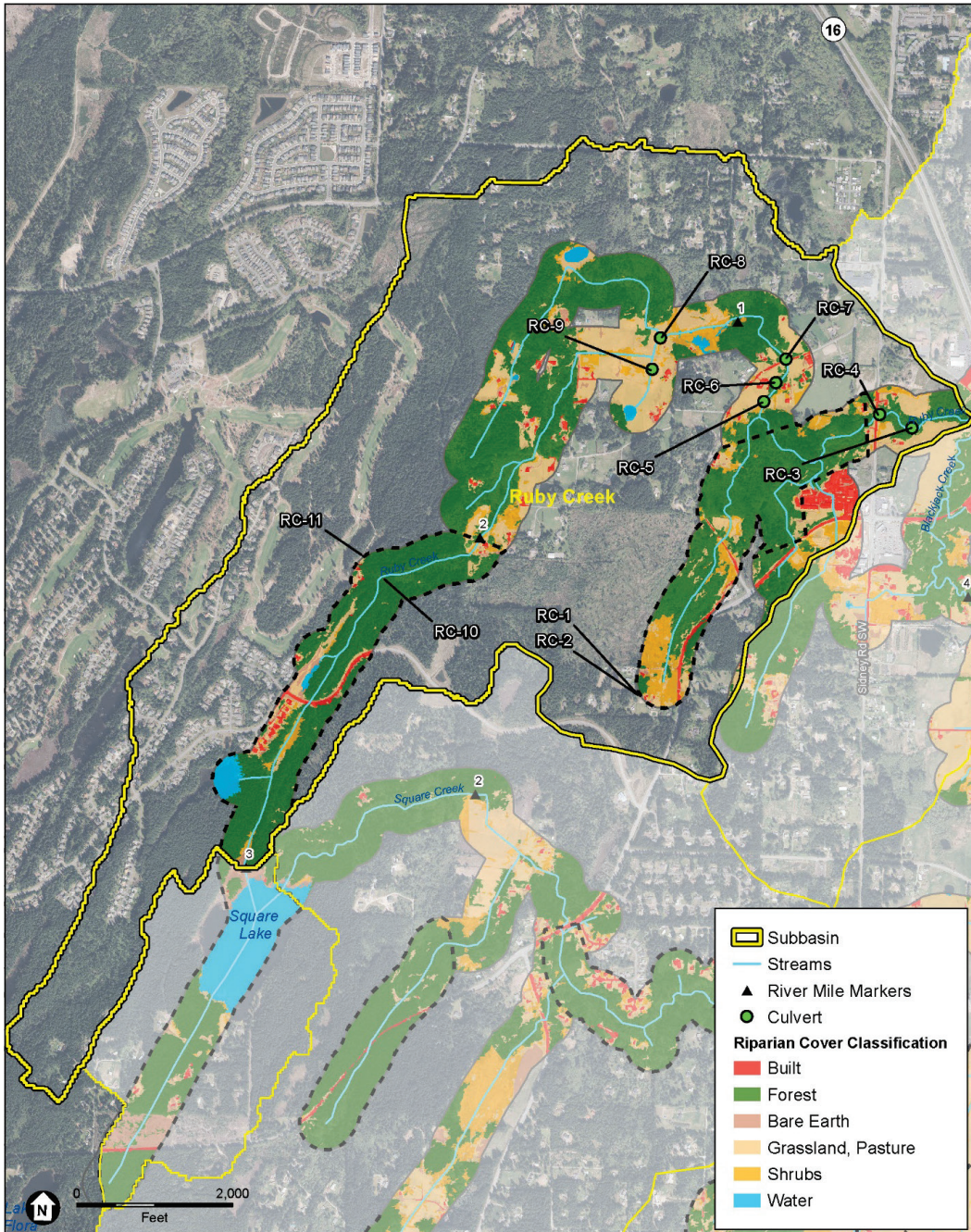
RC7-Fish Passage Improvements @ Glenwood Road

RC8-Fish Passage Improvements and Restoration upstream of Glenwood Road

RC9-Restoration of Ruby Creek north of SW Harper Road

RC10-Protect Riparian Habitat

RC11-Maintain or Expand Protective Zoning



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Thank you!

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Contact Information:

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Link to Blackjack Watershed report:

https://suquamish.nsn.us/home/departments/fisheries/environment/restoration-protection/