Nisqually Watershed

Successful Implementation of RCW 90.94.020

Decision Points

June 6, 2019

Lisa Dally Wilson, PE
WRIA 15 WRE Committee

DALLY ENVIRONMENTAL

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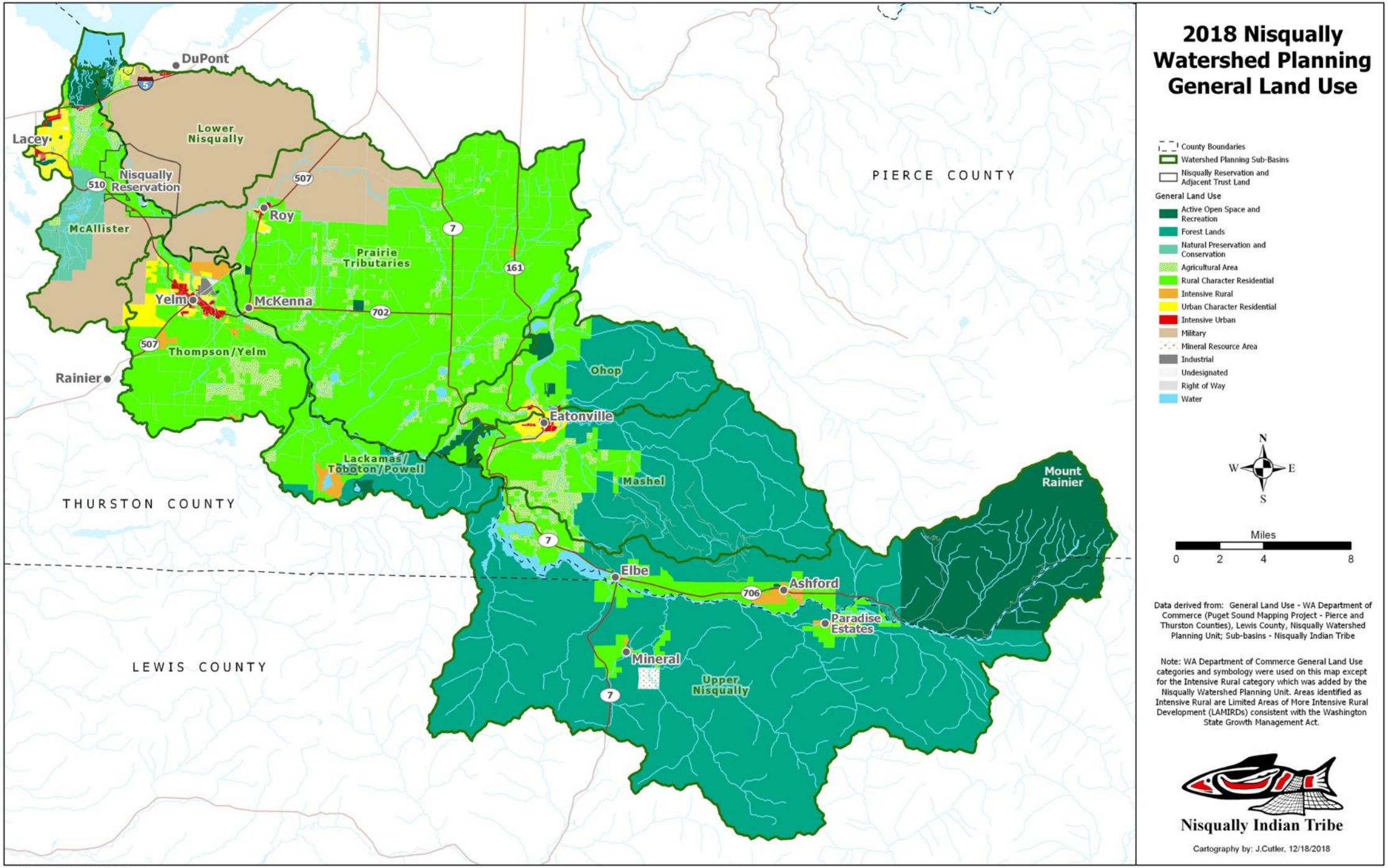

2018 Nisqually Watershed Planning General Land Use

County Boundaries
Watershed Planning Sub-Basins
Nisqually Reservation and Adjacent Trust Land

General Land Use

- Active Open Space and Recreation
- Forest Lands
- Natural Preservation and Conservation
- Agricultural Area
- Rural Character Residential
- Intensive Rural
- Urban Character Residential
- Intensive Urban
- Military
- Mineral Resource Area
- Industrial
- Undesignated
- Right of Way
- Water

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Data derived from: General Land Use - WA Department of Commerce (Puget Sound Mapping Project - Pierce and Thurston Counties), Lewis County, Nisqually Watershed Planning Unit; Sub-basins - Nisqually Indian Tribe

Note: WA Department of Commerce General Land Use categories and symbology were used on this map except for the Intensive Rural category which was added by the Nisqually Watershed Planning Unit. Areas identified as Intensive Rural are Limited Areas of More Intensive Rural Development (LAMIRDs) consistent with the Washington State Growth Management Act.

Nisqually Indian Tribe

Cartography by: J.Cutler, 12/18/2018

WRIA 11 OVERVIEW

- History of Collaboration
  - Nisqually River Council - 1987
  - 2003 Nisqually Watershed Plan
  - Plan Addendum in Response to RCW90.94.020
- Nisqually Tribe – Planning Unit Lead
- RCW90.94.020 - 3000 gpd – maximum daily consumption per connection
- Adopted by Ecology – February 1, 2019

PLANNING UNIT MEMBERS

IMPLEMENTING GOVERNMENTS

- Nisqually Indian Tribe - LEAD
- Thurston, Pierce and Lewis Counties

OTHER PARTICIPANTS

- Cities of Lacey, Olympia, Yelm
- Town of Eatonville
- Thurston PUD
- WDFW, WA Dept of Ag, Ecology
- Nisqually River Council Citizens Advisory Committee

WRIA 11 – Basic Steps to Implementing RCW 90.94.020

Interim Guidance for Determining Net Ecological Benefit

Dept of Ecology June 2018

- "Characterize and quantify potential impacts to instream resources from the proposed 20-year new domestic permit-exempt water use at a scale that allows meaningful determinations of whether proposed offsets will be in-time and/or in the same sub-basin."

- "Suitably sized sub-basins"

- If available, estimates of:
  - -Timing of impacts
  - -Proportion of flow impacted

- "Anticipated benefits to instream resources from actions [projects and policies] designed to restore streamflow will offset and exceed projected impacts from new water use"

Basic Steps to Implementing RCW 90.94.020

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1. Define and Delineate Appropriately Sized Sub-basins
2. Estimate 20-Year Population Growth and New Dwelling Units
3. Calculate New Domestic Permit-Exempt Connections
4. Estimate Consumptive Use (3 methods)
5. Identify Projects and Actions to Offset 20 years of Consumptive Use
6. Quantify/Develop Projects and Actions as Offsets

Basic Steps to Implementing RCW 90.94.020

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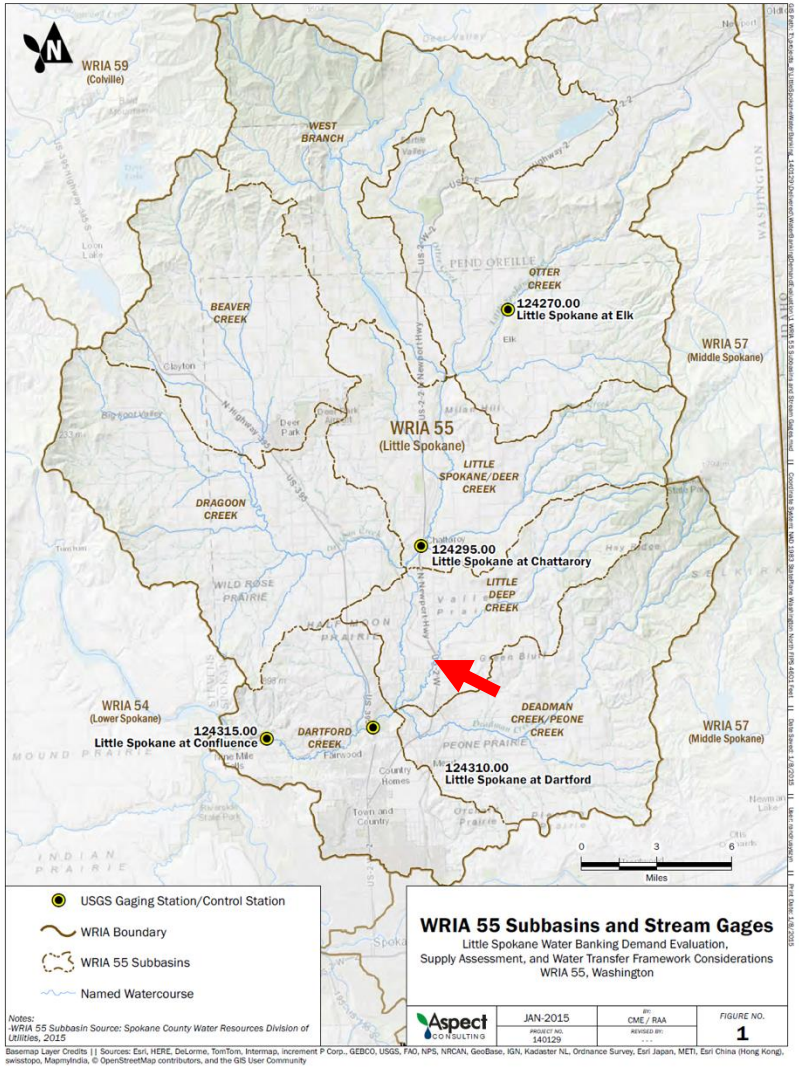
5. **Identify Projects and Actions to Offset 20 years of Consumptive Use**
6. **Quantify/Develop Projects and Actions as Offsets**

Impacts of permit-exempt use on streamflow – Little Spokane River Watershed



Modeled average reduction in flow (cfs) during July, August, September at Dartford Gage

Year	2040 Permit Exempt Demand	2040 Climate Change No Additional Demand
2005	-0.26	-14.5
2006	-1.42	-13.4
2007	-0.44	-14.4
2008	-1.72	-21.8
2009	-2.35	-24.6
2010	-1.08	-19.6
2011	-1.01	-30.7
2012	-0.56	-27.3
2013	-0.58	-29.4

Basic Steps to Implementing RCW 90.94.020

1. **Define and Delineate Appropriately Sized Sub-basins**
2. Estimate 20-Year Population Growth and New Dwelling Units
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WRIA 11: Sub-basin Delineation

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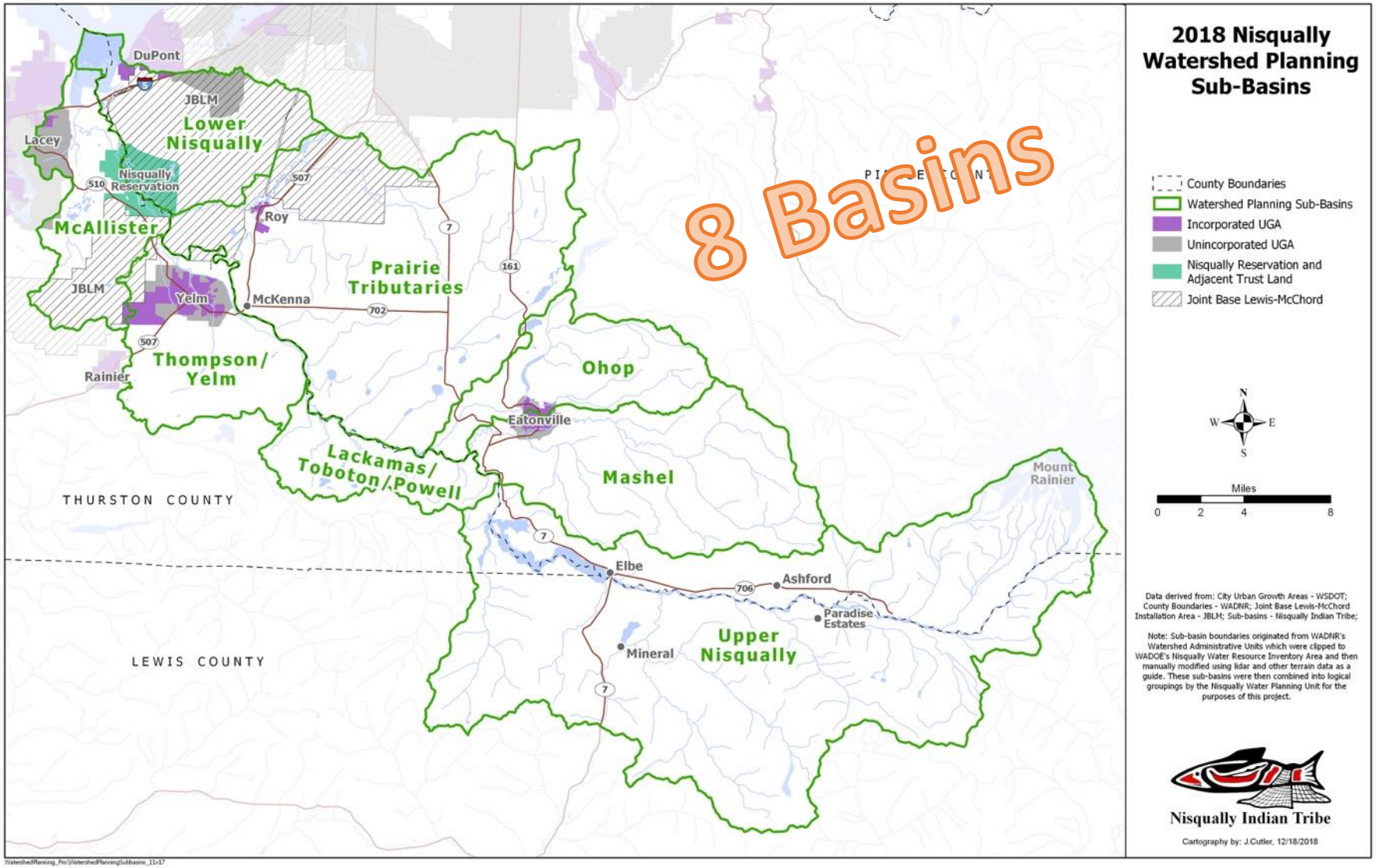
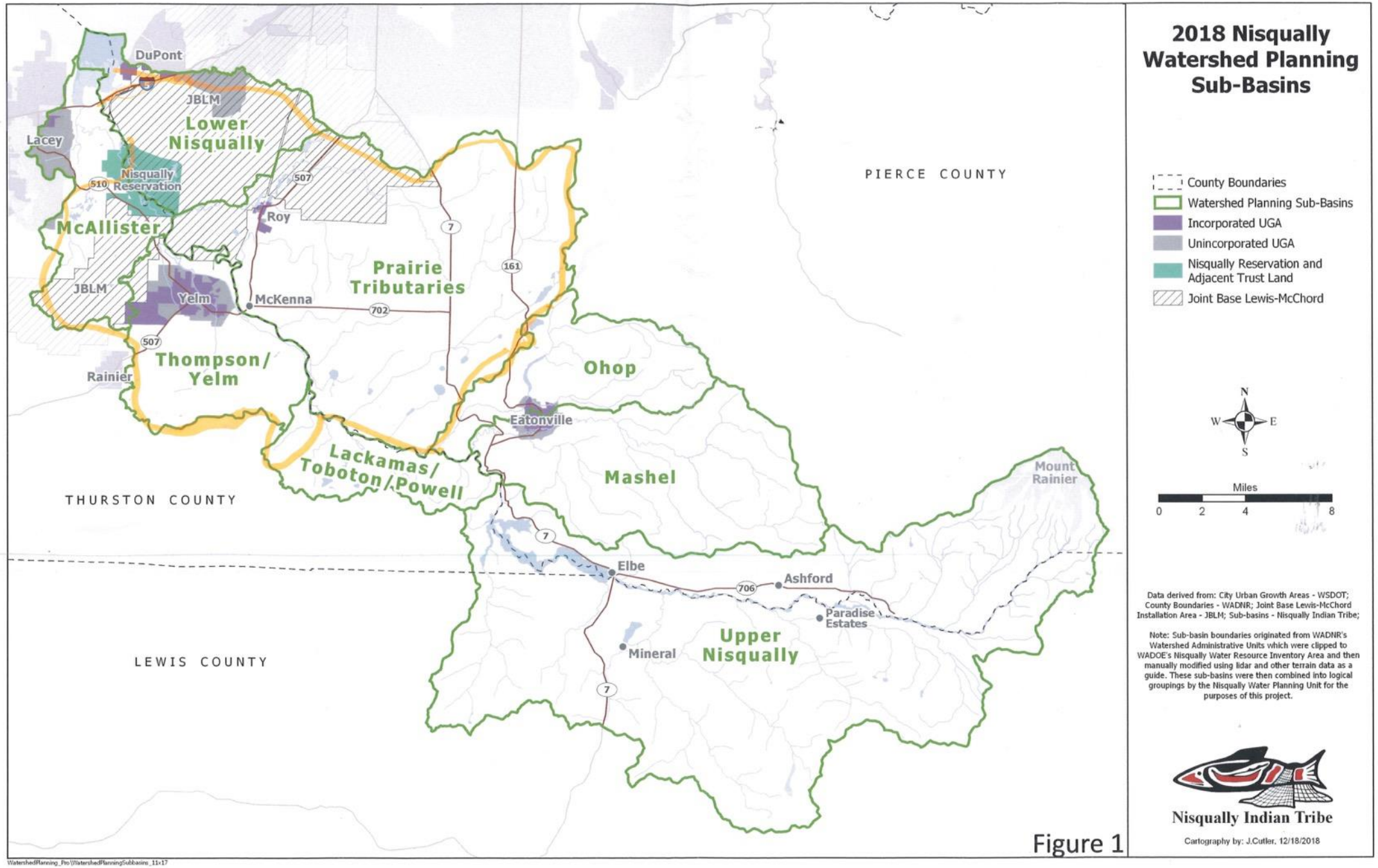
Step 1
Define appropriate sub-basins




2018 Nisqually Watershed Planning Sub-Basins
DuPont
JBLM
Lower Nisqually
Lacey
Nisqually Reservation
510
507
Roy
McAllister
7
161
Prairie Tributaries
JBLM
Yelm
McKenna
702
507
Thompson/ Yelm
Rainier
Ohop
Eatonville
Lackamas/ Toboton/Powell
Mashel
Mount Rainier
THURSTON COUNTY
PIERCE COUNTY
7
Elbe
706
Ashford
Paradise Estates
Mineral
Upper Nisqually
7
LEWIS COUNTY
County Boundaries
Watershed Planning Sub-Basins
Incorporated UGA
Unincorporated UGA
Nisqually Reservation and Adjacent Trust Land
Joint Base Lewis-McChord
N
W
E
S
Miles
0
2
4
8
Data derived from: City Urban Growth Areas - WSDOT; County Boundaries - WADNR; Joint Base Lewis-McChord Installation Area - JBLM; Sub-basins - Nisqually Indian Tribe;
Note: Sub-basin boundaries originated from WADNR's Watershed Administrative Units which were clipped to WADOE's Nisqually Water Resource Inventory Area and then manually modified using lidar and other terrain data as a guide. These sub-basins were then combined into logical groupings by the Nisqually Water Planning Unit for the purposes of this project.
Nisqually Indian Tribe
Cartography by: J.Cutler, 12/18/2018
Figure 1
WatershedPlanning_Pro\WatershedPlanningSubbasins_11x17

Committee Decision Point

- ✓ Approve Proposed Sub-basins
- **Estimate 20-Year Population Growth and New Dwelling Units**
- Calculate New Domestic Permit-Exempt Connections
- Estimate Consumptive Use (3 methods)
- Identify Projects and Actions to Offset 20 years of Consumptive Use
- Quantify/Develop Projects and Actions as Offsets

WRIA 11: Estimate Growth

Step 2
22 Year Population Growth and New Dwelling Units (2018-2040)

- 3 Counties, 3 methods
- Thurston – TRPC growth projections
- Pierce – Historical percentages of permit-exempt well growth by sub-basin
- Lewis – growth projections
- 22 Year Projection (through 2040)
- Not a PU decision point in WRIA 11

Committee Decision Point

✓ Approve Proposed Sub-basins

- **Estimate 20-Year Population Growth and New Dwelling Units (Optional Decision Point)**

  A. Counties provide using their chosen growth forecasting methods (Nisqually: 2018-2040)

  OR

  B. Committee Oversight of methodology and assumptions inherent in the method

Committee Decision Point

✓ Approve Proposed Sub-basins

✓ Estimate 20-Year Population Growth and New Dwelling Units (Optional Decision Point)

- **Calculate New Domestic Permit-Exempt Connections**
- Estimate Consumptive Use (3 methods)
- Identify Projects and Actions to Offset 20 years of Consumptive Use
- Quantify/Develop Projects and Actions as Offsets

WRIA 11: New Connections

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Step 3
Calculate New Domestic Permit-Exempt Well Connections

- By County, by sub-basin
- Cities, Towns to weigh in on PE well policies within their jurisdictions and UGAs
- PUDs – provide information on available connections
- Dept of Health Sentry database, other options to ID available connections in existing Group A and B systems

Step 3

Calculate new domestic permit-exempt connections, 2018-2040

Total Estimated New Permit-Exempt Connections Aggregated by Sub-basin

Sub-basin	UGA Connections	Rural Connections	Total Connections
McAllister	39	116	155
Thompson/Yelm	1,036	526	1,562
Lackamas/Toboton/Powell	-	430	430
Lower Nisqually		2	2
Mashel River		20	20
Prairie Tributaries		596	596
Ohop Creek		27	27
Upper Nisqually (Lewis, Pierce, Thurston)		195	195
Total	1,075	1,912	2,987

Committee Decision Point

- ✓ Approve Proposed Sub-basins
- ✓ Estimate 20-Year Population Growth and New Dwelling Units(Optional Decision Point)
- ✓ Calculate New Domestic Permit-Exempt Connections (Optional Decision Point)
- **Estimate Consumptive Use (3 methods)**
- Identify Projects and Actions to Offset 20 years of Consumptive Use
- Quantify/Develop Projects and Actions as Offsets

Estimate Consumptive Water Use by PE Connections

Step 4

Estimate Consumptive Use

	Annual Average Consumptive Use per connection (gpd)	
	Total	Outdoor
Actual Water Use – Thurston PUD Method	95 gpd	80 gpd outdoor
Ecology Method	223 gpd	208 gpd outdoor
Legal Method	1,644 gpd	1,536 gpd outdoor

Ecology guidance:

- 10% indoor use is consumptive
- 80% outdoor use is consumptive

Possible Committee Decisions

- **Estimate Consumptive Use**
  - Methodology (Actual, Ecology, Legal, other)
  - Average Annual Basis or other (consider how you will compare to streamflow)
  - Indoor per person water use (Ecology Guidance - 60 per person per day)
  - Outdoor irrigable land (assume 1/2 acre or determine specific average area with GIS analysis)
  - Crop type and irrigation requirements
  - Irrigation efficiency percentage
  - Assumed consumptive portion of total use (Ecology Guidance -10% indoor, 80% outdoor)

WRIA 11 – Consumptive Use Results

Estimate New Domestic Permit-exempt Well Connections and Associated Consumptive Use
2018 – 2040
ECOLOGY METHOD

Sub-Basin	Total PE Connections	Annual Consumptive Use (AFY)	Cubic feet/second	cfs per connection
McAllister	155	39	0.054	
Thompson/Yelm	1,562	390	0.539	
Lackamas/Toboton/ Powell	430	107	0.148	
Lower Nisqually River	2	0	0.001	
Mashel River	20	5	0.007	
Prairie Tributaries	596	149	0.206	
Ohop Creek	27	7	0.009	
Upper Nisqually (all counties)	195	49	0.067	
Total	2,987	747	1.032	0.0003453

WRIA 11 – Micro and Macro Approach to Offsets Based on Consumptive Use Methodology

Step 4

3 METHODS to Calculate Consumptive Water Use

	Nisqually Watershed: Projected Annual Average Consumptive Use	
	(AFY)	(CFS)
Actual Water Use – Thurston PUD	318	0.439
Ecology Method	747	1.032
Legal Method	5,501	7.598

Micro

Macro

USGS – McKenna Gage on Nisqually River August Mean Discharge, 2000- 2010

Watershed Offset Requirement

1.03 cfs

Committee Decision Point

- ✓ Approve Proposed Sub-basins
- ✓ Estimate 20-Year Population Growth and New Dwelling Units(Optional Decision Point)
- ✓ Calculate New Domestic Permit-Exempt Connections (Optional Decision Point)
- ✓ Consumptive Use (3 methods)
- **Identify Projects and Actions to Offset 20 years of Consumptive Use**
- Quantify/Develop Projects and Actions as Offsets

WRIA 11 – Micro and Macro Approach to Offsets

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Step 5

Identify Offset Projects and Actions

Micro Mitigation (Offsets)

- City of Yelm - Water Right Offset (future + current)
- Water System Improvements (Group A and B)
- Water Right Acquisition
- Reclaimed Water Infiltration
- Local Stream Restoration – Lower Sub-basins
- Managed Aquifer Recharge (MAR)
- Update County permitting processes - policies for Implementation – bank, credit system

Projects had varying levels of development: some conceptual, some quantitative

WRIA 11 – Micro and Macro Approach to Offsets

Step 5

Watershed Scale Offsets

Macro Mitigation (Offsets)

- Address Major Barriers to Salmon Recovery
- Community Managed Forests (VELMA Model)
- Large Scale Floodplain and Riparian Restoration & Protection Projects (Ohop Creek)
- Mashel River Baseflow Strategies – Eatonville Infrastructure Improvements

Projects had varying levels of development: some conceptual, some quantitative

Coordinating with Ongoing Recovery Priorities

It is very important to coordinate Salmon Recovery efforts and Water Resource/ISF efforts!

Start the Conversation Early!

Salmon Recovery Habitat Initiatives as Offsets

Salmon Recovery Initiative	Priority	Sub-Basin	Key Actions
Mashel Watershed Recovery/ Community Forest	1	Mashel	Acquire commercial forestland to place in conservation management for streamflow enhancement
Ohop Watershed Recovery/ Community Forest	7	Ohop	Acquire commercial forestland to place in conservation management for streamflow enhancement
Bald Hills Watershed Recovery/ Community Forest	8	Lack/Tob/Powell	Acquire commercial forestland to place in conservation management for streamflow enhancement
Mashel Base Flow	2	Mashel	Implement Town of Eatonville stormwater and infrastructure improvements
Ohop Valley Floodplain Restoration	3	Ohop	Restore 3.1 miles of channelized stream and 710 acres of riparian and floodplain habitat
Mashel River Riparian Corridor Protection and Restoration	4	Mashel	Protect riparian corridor and restore habitat complexity through log jams and riparian plantings
Muck Creek Recovery*	5	Prairie Tributaries	Restore up to 60 miles of impaired streams and surrounding floodplain/wetland habitat; maintain hydrologic function of prairie ecosystem through prescribed burns
Prairie Tributaries Recovery*	6	Prairie Tributaries, Thom/Yelm, Lack/Tob/Powell	Restore up to 20 miles of impaired streams and surrounding floodplain/wetland habitat; maintain hydrologic function of prairie ecosystem through prescribed burns
Barrier Removal*	9	Multiple	Remove fish passage barriers

Ohop Creek Restoration

Consumptive Use (Ecology Method) Compared to Minimum and Maximum Estimated Offsets (See Table 7-2)

Sub-basin	ECY Method Annual PE Consumptive Use (cfs)	Offset Actions (cfs) MIN	Offset Actions (cfs) MAX
McAllister	0.054	TBD	TBD
Thompson/Yelm	0.539	0.479	1.050
Lackamas/Toboton/Powell	0.148	0.116	0.697
Lower Nisqually	0.001	0	0.552
Mashel River	0.007	3.48	7.27
Prairie Tributaries	0.206	0.058	2.058
Ohop Creek	0.009	0.017	2.105
Upper Nisqually (Pierce, Lewis, Thurston)	0.067	0.067	0.619
TOTAL	1.03	4.22	14.35

Step 5: Projects and Actions

- Don’t forget the Actions
- Track Potential Actions throughout the process
  - Consider PE well connection policies (cities, towns, PUDs)
  - Consider PE well replacement opportunities
  - Tracking system
    - Track PE wells development vs. Offsets
    - Track credits (eg., well abandonment, other)
    - Ensure that offsets keeps up with well development

Net Ecological Benefit (NEB)

- Nisqually Plan Addendum did not provide full analysis of all projects or their probability of occurring per interim NEB guidance
- Nisqually Planning Unit Core Strategy
  - Micro-offset projects provide sub-basin specific offsets
  - In coordination with the Nisqually Salmon Recovery Strategy, macro-offset projects recommended will, in combination with ‘micro projects’ and actions, provide NEB

Net Ecological Benefit (NEB)

- *"This addendum to the Nisqually Watershed Plan identifies specific mitigation strategies and policy recommendations designed to offset the impacts that new PE wells may have on streamflows or other senior water rights. It also, in coordination with the Nisqually Salmon Recovery Strategy, makes recommendations for habitat projects that will, in combination with mitigation strategies, provide NEB for streamflows in the Nisqually Watershed" (Nisqually PU, 2019).*

- *"While the WRIA 11 watershed plan Addendum does not adhere to Ecology's guidance documents…. Taken as a whole, the results indicate that relative to the detriments created by future permit-exempt domestic wells anticipated in WRIA 11 over the next 20 years, the offset strategies proposed would result in a NEB for the watershed."*

- Ecology Technical Review, January 29, 2019

WRIA 11 – Ecology Determination of NEB

Ecology Review

- *"The Plan Addendum provides varying levels of details and analyses (*for the 22 strategies presented) . . . *In light of the conceptual nature of much of the plan's description of strategies, Ecology's technical review segregated the strategies into 3 tiers."*

- *Adoption with Conditions*
  - Annual Reporting
  - Five Year Self Assessment
  - Ongoing Compliance with RCW 90.94.020 (recording and reporting requirements)

Ecology Technical Review, January 29, 2019

Committee Decision Point

- ✓ Approve Proposed Sub-basins
- ✓ Estimate 20-Year Population Growth and New Dwelling Units(Optional Decision Point)
- ✓ Calculate New Domestic Permit-Exempt Connections (Optional Decision Point)
- ✓ Estimate Consumptive Use (method and assumptions)
- ✓ Identify Projects and Actions to Offset 20 years of Consumptive Use
- **Quantify/Develop Projects and Actions as Offsets**

WRIA 11 – Basic Steps to Implementing RCW 90.94.020

Step 6 Quantify/Develop Projects & Actions as Offsets

Next Steps

- Planning Unit is doing this now through December, moving toward implementation
- Re-evaluating priorities from Tiers determined by Ecology in their NEB evaluation
- Considering implementation barriers, multiple benefits, concerns regarding MAR effectiveness, and unintended consequences of water purchase on Ag.
- Find Funding: Good Plan, Needs Action/investment
- Accounting System??: How do we ensure offsets keep pace with growth? 3 Counties, one

Lessons Learned

- Focus time and effort on developing robust offset actions providing multiple benefits – **Offset Projects**
- 20 years of domestic PE Consumptive Use is a relatively small impact to streamflow – conservatively estimate and move on to the important part
- Work collaboratively with local salmon groups – overcome the language barrier between Water Resource and Salmon Recovery Scientists
- QUANTIFY your offsets
- Aim for multiple benefits, multiple goals, and consider reaching big
- TRUST and PARTNERSHIPS and HISTORY of collaboration MATTER

Thank You!

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