

Nisqually Watershed Response to the 2018 Streamflow Restoration Act (RCW 90.94)

Spring 2019 Streamflow Team Meeting
March 21, 2019

Mike Gallagher
Southwest Region
WRIA 11 Planning Unit Member

Addendum to the
Nisqually Watershed Management Plan

Acknowledgements

This Addendum to the Nisqually Watershed Plan was developed through the participation and input of numerous stakeholders from the Nisqually Watershed over the past year in a rapid response to the mandate of the Streamflow Restoration Act (chapter 90.94 RCW). We are grateful for the expertise and responsiveness of these Planning Unit members:

PLANNING UNIT:

Gary Bahr – Department of Agriculture
Jesse Barham – City of Olympia
Grant Beck – City of Yelm
Dan Cardwell – Pierce County
Tom Culhane – Department of Ecology
Matthew Curtis – Department of Fish & Wildlife
Joshua Cummings – Thurston County
Jeff Dickison – Squaxin Island Tribe
Fred Evander – Lewis County
Willie Frank III – Nisqually Indian Tribe
Mike Gallagher – Department of Ecology
Kiza Gates – Department of Fish & Wildlife
Michael Grayum – City of Yelm
Abby Gribi – Town of Eatonville
Jessica Gwilt – Pierce County
Dennis Hanberg – Pierce County
Kevin Hansen – Thurston County
Justin Hall – Nisqually River Foundation
Andy Haub – City of Olympia
Tom Kantz – Pierce County
Lee Napier – Lewis County
Russell Olsen – Thurston Public Utility District
Allison Osterberg – Thurston County
Julie Rector – City of Lacey
Joe Roush – City of Olympia
James Slape – Nisqually Indian Tribe
Rance Smith – Pierce County
Barbara Ann Smolko – Pierce County
Gary Stamper – Lewis County
David Troutt – Nisqually Indian Tribe
George Walter – Nisqually Indian Tribe
Lois Ward – Nisqually River Council CAC
John Weidenfeller – Thurston Public Utility District
Cynthia Wilson – Thurston County

PLANNING UNIT SUPPORT

George Walter, Nisqually Indian Tribe – Planning Unit Lead
Lisa Dally Wilson, Dally Environmental – Facilitator and Project Manager
Emily McCartan, Nisqually River Council – Habitat Work Group Liaison and Staffing Support

WORK GROUPS:

WATER FORECAST WORK GROUP:
Dan Cardwell – Pierce County
Tom Culhane – Department of Ecology
Lisa Dally Wilson – Dally Environmental
Fred Evander – Lewis County
Mike Gallagher – Department of Ecology
Allison Osterberg – Thurston County
Rance Smith – Pierce County
George Walter – Nisqually Indian Tribe
John Weidenfeller – Thurston Public Utility District

HABITAT PROJECT WORK GROUP:
Matt Barnhart – Pierce County
Lisa Dally Wilson – Dally Environmental
Chris Ellings – Nisqually Indian Tribe
Justin Hall – Nisqually River Foundation
Kevin Hansen – Thurston County
Sayre Hodgson – Nisqually Indian Tribe
Tom Kantz – Pierce County
Emily McCartan – Nisqually River Foundation
Allison Osterberg – Thurston County
David Troutt – Nisqually Indian Tribe
Ashley Von Essen – Nisqually Indian Tribe

OTHER STRATEGIES WORK GROUP
Grant Beck – City of Yelm
Lisa Dally Wilson – Dally Environmental
Abby Gribi – Town of Eatonville
Kevin Hansen – Thurston County
Tom Kantz – Pierce County
Emily McCartan – Nisqually River Foundation
Dave Nazy – EA Engineering, Science, & Technology, Inc.
Allison Osterberg – Thurston County
Rance Smith – Pierce County
Barbara Ann Smolko – Pierce County
Gary Stamper – Lewis County
George Walter – Nisqually Indian Tribe
John Weidenfeller – Thurston Public Utility District

Under the leadership of the Nisqually Indian Tribe, the Nisqually Watershed Planning Unit reconvened in July of 2018 to address the requirements of the Streamflow Restoration Act (RCW 90.94.020) with an Addendum to the 2003 Nisqually Watershed Management Plan. The Act requires the Planning Unit to provide estimates of consumptive water use from domestic permit-exempt well connections in the watershed over the next 20 years and identify mitigation actions to offset the potential impacts of forecasted permit-exempt water use on instream flows and senior water right holders. Overall mitigation is expected to provide a Net Ecological Benefit (NEB) to the entire watershed. The Washington State Department of Ecology (Ecology) is tasked with making a final determination of NEB.

The Nisqually Watershed Plan Addendum is a companion document to the 2003 Nisqually Watershed Management Plan and 2007 Phase IV Implementation Plan.

Relevant background information and associated figures from the 2003 plan are referenced and, unless of specific benefit, are not repeated in the Addendum.



Nisqually Watershed Water Planning Unit

ESSB 6091 – Streamflow Restoration Act

In the 2018 Streamflow Restoration Act (ESSB 6091), the Washington State Legislature mandated that the Nisqually Watershed Planning Unit proceed quickly to develop a watershed plan amendment to develop strategies to mitigate impacts of future exempt wells on stream flows. The Legislature, in passing the act, allocated \$300 million in capital funds over the next 15 years for all watershed planning and watershed restoration and enhancement projects.

The Nisqually Planning Unit approved a [Watershed Plan Addendum](#) for WRIA 11 addressing the Streamflow Restoration Act on January 16, 2019. The [Department of Ecology](#) adopted the Addendum on February 1, 2019. The Addendum estimates consumptive water use by new domestic permit-exempt well connections within the watershed through 2040, and identifies mitigation actions to offset instream flow impacts of this use and provide Net Ecological Benefit. Public outreach and adoption processes by Thurston, Pierce, and Lewis Counties and the Nisqually Indian Tribe governments are ongoing.

Planning Unit meeting schedule and materials are available here for members of the public. Contact info@nisquallyriver.org for more information.

Watershed Plan Addendum

[Nisqually Watershed Response to the 2018 Streamflow Restoration Act \(RCW 90.94\): Addendum to the Nisqually Watershed Management Plan \(1/6/19\)](#)

- [Figures](#)
- [Appendices](#)

[Department of Ecology Adoption Order \(2/1/19\)](#)

- [Ecology Technical Review](#)
- [Recommendation to Adopt with Conditions](#)

Planning Unit Documents

[EIS/SEPA Review Checklist and Supporting Documents](#) (Pierce County Permit ID #903160)

[EIS Addendum \(1/29/19\)](#)

[Nisqually Planning Unit Working Agreement](#) (signed 11/5/18)

[Planning Guidance](#) (Washington State Department of Ecology)

[Public Comment from CAC Public Information Session, 10/11/18](#)

[Nisqually Water Planning Unit Fact Sheet \(one page\)](#)

Planning Unit Meeting Schedule

Planning Unit meetings are open to the public. For information, please contact emily@nisquallyriver.org.

June 28, 2018 – Nisqually Indian Tribe Natural Resources

[Minutes](#)

July 24, 2018 – Nisqually Indian Tribe Natural Resources

[Agenda](#) [Minutes](#)

August 30, 2018 – Nisqually Indian Tribe Natural Resources

[Agenda](#) [Minutes](#)

September 19, 2018 – Yelm Community Center

[Agenda](#) [Minutes](#)

October 17, 2018 – Thurston Public Utility District

[Agenda](#) [Minutes](#)

November 14, 2018 – Billy Frank Jr. Nisqually National Wildlife Refuge

[Agenda](#) [Minutes](#)

December 19, 2018 – Nisqually Indian Tribe Council Chambers

[Agenda](#) [Minutes](#)

January 16, 2018 – Billy Frank Jr. Nisqually National Wildlife Refuge

[Agenda](#) TBD

Organization of the Nisqually Plan Addendum

1. Introduction and Background

2. Watershed Features that Influence Mitigation Alternatives

3. Water Use Forecasts: By county, by sub-basin and for the full watershed

Three different water use forecasts were generated:

- 1) actual annual average consumptive use based on Thurston PUD data,
- 2) actual annual average consumptive use based on Ecology methodology, and
- 3) an estimate of the consumptive portion of the legal right to the water (3000 gpd).

4. Salmon Habitat Projects

Addressing larger scale salmon recovery initiatives

5. Mitigation Strategies in the Nisqually Watershed

Addressing sub-basin scale mitigation strategies tailored for each sub-basin in WRIA 11.

6. County Strategies

Including overviews of the permitting process and possible implementation strategies for the three counties.

7. Mitigation Offsets by Sub-basin

Providing a quantitative summary of the mitigation offsets, identified for each project by sub-basin and by full watershed.

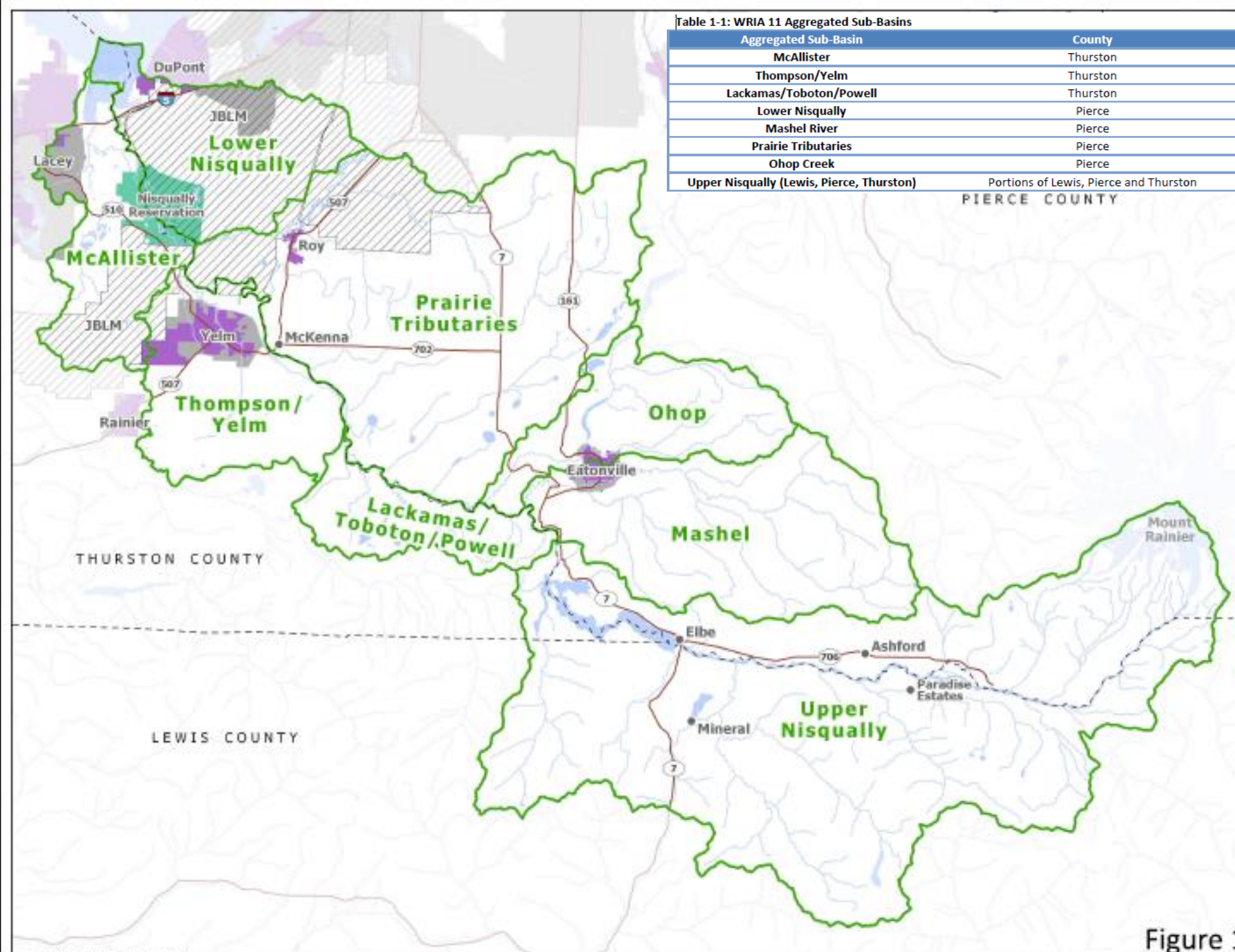
8. Implementation and Adaptive Management

Identifying implementation responsibilities as understood by the Planning Unit and an approach to adaptive management that recognizes that the Planning Unit will continue to work toward implementation.

2018 Nisqually Watershed Planning Sub-Basins

Table 1-1: WRIA 11 Aggregated Sub-Basins

Aggregated Sub-Basin	County
McAllister	Thurston
Thompson/Yelm	Thurston
Lackamas/Toboton/Powell	Thurston
Lower Nisqually	Pierce
Mashel River	Pierce
Prairie Tributaries	Pierce
Ohop Creek	Pierce
Upper Nisqually (Lewis, Pierce, Thurston)	Portions of Lewis, Pierce and Thurston



- County Boundaries
- Watershed Planning Sub-Basins
- Incorporated UGA
- Unincorporated UGA
- Nisqually Reservation and Adjacent Trust Land
- Joint Base Lewis-McChord



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 WADNR'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.

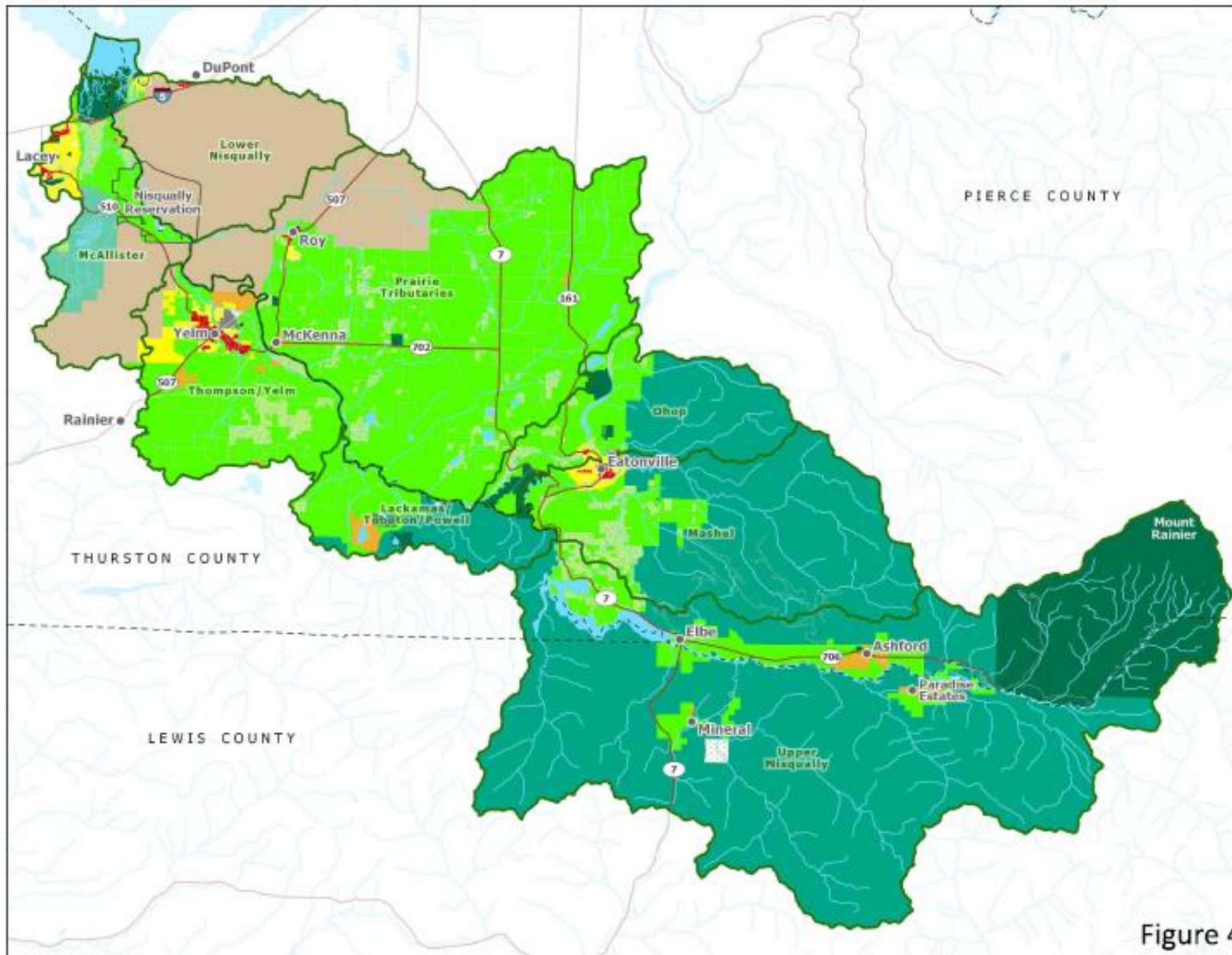


Nisqually Indian Tribe

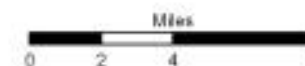
Cartography by: J. Geller, 12/16/2015

Figure 1

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



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. Diller, 12/16/2018

Figure 4

Nisqually Planning Unit Approach to Mitigation

- NPU defined a “two-part approach” to mitigating the impacts of future rural growth on streamflows in the watershed.

Micro-mitigation or sub-basin specific offsets will take the form of projects involving aquifer recharge, use of deeper aquifers to minimize impacts to local surface water bodies and water right acquisition, and policies that reduce rural water use and track mitigation credits as part of County building permit approval.

- Strategies intended to restore streamflows impacted by permit-exempt groundwater use within sub-basins over the next 20 years.

Macro-mitigation or larger, watershed-scale habitat projects that provide a NEB for the entire watershed and provide both flow benefits and ecological benefits essential to native salmon populations.

- Watershed-scale macro-mitigation goals as essential to the broader goals of the Streamflow Restoration Act to protect instream flows and salmon populations in an era of increasing development and changing climate.
- Withdrawals from domestic permit-exempt wells are one relatively small component of the water use challenges facing the Nisqually Watershed in the coming decades.
- As climate change impacts precipitation and hydrologic patterns, meeting the water needs of the growing communities of the middle and lower watershed basins will depend on long-term conservation actions taken throughout the watershed.
- Addendum presented macro-mitigation streamflow actions in the context of major salmon recovery habitat initiatives and providing sustainable NEB that supports this central goal of the Nisqually Watershed community.



Population and Water Use Forecasts

RCW 90.94.020 requires an assessment of the anticipated number of domestic permit-exempt wells and associated connections in the Nisqually Watershed over the next 20 years and the expected consumptive impacts of those wells.

Information in Plan Addendum addresses the first element of Ecology's *Interim Guidance for Determining Net Ecological Benefit* (June 2018b) in that it

“characterizes and quantifies potential impacts to instream resources from 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.”

Each County did their own forecast of population increase for the next 22 years (2018 – 2040).

Thurston County

2017 total population estimate: 280,588

Thurston County – 3rd fastest-growing county in Washington State over the past 10 years

County projected to grow by 42% between 2018 and 2040, increasing in population by more than 100,000 people countywide.

Within the Nisqually Watershed portion of the county, population is projected to grow 71%, from 42,000 to 72,000 (TRPC Populations Estimates Work Program, 2018).

The vast majority of that growth is likely to be in urban areas, with only 11% of population growth predicted to be located in rural areas.

Lewis County

2017 total population estimate: 78,200

The Upper Nisqually sub-basin in Lewis County is primarily composed of forestlands, though two settlements, Mineral and Paradise Estates, and some dispersed homes are present.

Vast majority of the sub-basin is situated in the Gifford Pinchot National Forest, or is zoned for long-term forestry with 80-acre minimum lot sizes.

The large required lot sizes and distance from major population centers limits the development of the area.

Growth in the Upper Nisqually sub-basin is expected to continue to be slow through 2040.

Where homes do exist within the sub-basin, many are for seasonal/vacation use.

Pierce County

2017 total population estimate: 876,764

Population growth projected for the rural areas in the Pierce County Comprehensive Plan is approximately 18,000 people during the 2010-30 twenty year planning horizon.

Growth has not yet been projected out to 2040.

Rural areas in the Pierce County portion of the Nisqually Watershed are characterized by low densities with scattered residential sites and moderate to large open acreages for farm or forest use. Commercial and noncommercial agricultural and forestry and other natural resource-based practices are consistent with rural areas.

Allowed densities in the rural areas of the Nisqually Watershed range from a low of one unit per 80 acres in the Forest Lands designation to one unit per five acres in the Rural 5 designation.

Table 3-15: Total Projected New Domestic Permit-Exempt Connections by Aggregated Sub-basin, WRIA 11 (2018-2040)

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

Water Use Estimates – Domestic Permit-Exempt Connections 2018-2040

Ecology provided recommendations for estimating water use from permit exempt well connections – to determine the estimation of actual indoor and outdoor water use by each permit-exempt well connection anticipated between 2018 and 2040.

- 90.94.020 RCW restrict the maximum annual average withdrawal from a connection to a permit-exempt well in WRIA 11 to 3,000 gallons per day (gpd) averaged over the entire year.
- The legal limit of 3,000 gpd is likely much greater than actual annual average indoor and outdoor domestic water use.

NPU elected to estimate both the actual annual average water use associated with a permit-exempt well connection and the legal right to the full water use as specified under 90.94.020 RCW.

This approach quantified a range of potential impacts to instream flows that can be addressed by a combination of sub-basin specific offsets and larger scale projects that provide a net ecological benefit for the entire watershed.

Two methods were used to estimate actual water use.

- Ecology guidance to estimate outdoor use based on irrigation requirements (Ecology, 2018a) and
- Based on actual data from 58 Group A and B water systems managed by the Thurston PUD.

Table 3-16: Nisqually Watershed: Actual Water Usage Assumptions

	Average Annual Indoor Use Per connection		Average Annual Outdoor Use per connection			
			Method 1		Method 2	
	AF/Year	gpd	Thurston PUD data	Ecology Irrigation Guidance	AF/Year	gpd
Total Use	0.170	150	0.112	100	0.292	261
Consumptive Use	0.0168	15	0.0896	80	0.233	208

Table 3-17: Nisqually Watershed: Legal Limit Water Usage Assumptions

	Legal Indoor Use per connection		Legal Outdoor Use per connection	
	AF/Year	gpd	AF/Year	gpd
Total Use	1.210	1,080	2.15	1920
Consumptive Use	0.121	108	1.72	1536

Consumptive use summary

Thurston PUD Data: 15 GPD indoor + 80 GPD outdoor = **95 GPD** total consumptive use

Ecology Guidance Method: 15 GPD indoor + 208 GPD outdoor = **223 GPD** total consumptive use

Legal Limit Method: 108 GPD indoor + 1,536 GPD outdoor = **1,644 GPD** total consumptive use

Table 3-18: Projected Actual Annual Average Consumptive Use of Domestic Permit-Exempt Wells, Nisqually Watershed, WRIA 11 (2018-2040) – **Thurston PUD Data Source**

Sub-Basin	Total PE Connections	Annual Consumptive Use (AFY)	Cubic Feet/Second (CFS)	CFS per connection	AFY per connection
McAllister	155	16	0.023		
Thompson/Yelm	1,562	166	0.230		
Lackamas/Toboton/Powell	430	46	0.063		
Lower Nisqually River	2	0	0.000		
Mashel River	20	2	0.003		
Prairie Tributaries	596	63	0.088		
Ohop Creek	27	3	0.004		
Upper Nisqually (all counties)	195	21	0.029		
Total	2,987	318	0.439	0.000147	0.1064

Table 3-19: Projected Actual Annual Average Consumptive Use of Domestic Permit-Exempt Wells, Nisqually Watershed, WRIA 11 (2018-2040) – **Ecology Guidance Method**

Sub-Basin	Total PE Connections	Annual Consumptive Use (AFY)	Cubic Feet/Second (CFS)	CFS per connection	AFY 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	0.000345	0.25

Table 3-20: **Projected Legal Consumptive Water Use** of Domestic Permit-Exempt Wells, Nisqually Watershed, WRIA 11 (2018-2040)

Sub-Basin	Total PE Connections	Annual Consumptive Use (AFY)	Cubic Feet/ Second (CFS)	CFS per connection	AFY per connection
McAllister	155	285	0.394		
Thompson/Yelm	1,562	2,876	3.973		
Lackamas/Toboton/ Powell	430	792	1.094		
Lower Nisqually River	2	4	0.005		
Mashel River	20	37	0.051		
Prairie Tributaries	596	1,098	1.516		
Ohop Creek	27	50	0.069		
Upper Nisqually (all counties)	195	359	0.496		
Total	2,987	5,501	7.598	0.002544	1.84

Legal and Historical Context

- Nisqually Indian Tribe is signatory to the Medicine Creek Treaty of 1854 (35 years before statehood), in which they reserved the right to fish, hunt, and gather forever. The promise made to the Tribe was that salmon and salmon fishing would continue to be available into the future as it had been in the past.
- Over the past 160 years the region has changed dramatically, including loss and impacts to the fresh and marine habitats that are critical to the survival of salmon, to the point where the runs of salmon are less than 10% of historic levels.
- The decline of wild Chinook and steelhead has been so precipitous that they are both listed as Threatened under the Endangered Species Act.
- The Tribe's fishing seasons have decreased along with the demise of the various runs of salmon in the Nisqually River.
- In the years immediately following the federal court decision upholding treaty rights in *United States v. Washington* (1974), known as the Boldt decision, the Nisqually Tribe fished sustainably for eight months of the year on the various runs of salmon returning to the Nisqually River.
- The fishery reached its all time low in terms of time on the river in 2015, when the Tribe fished a total of eight days.

Net Ecological Benefit and Salmon Recovery Goals

In the Ecology *Interim Guidance for Determining Net Ecological Benefit* (Publication 18-11-009, Ecology 2018b), Ecology established criteria for determining if “**anticipated benefits to instream resources from actions designed to restore streamflow will offset and exceed the projected impacts to instream resources from new water use**”.

The guidance further specifies that NEB **may be achieved by a combination of water offset projects with direct flow benefits, and non-water offset projects, providing “ecological benefits by enhancing aquatic systems to improve capacity to support viable populations of native species.”**

Addressing this central issue required the Planning Unit to think about NEB at a watershed-wide scale beyond the twenty-year timeframe.

Permit-exempt well use is a relatively small component of the challenge the Nisqually Watershed will face in balancing its water budget for salmon and human uses over the coming decades, as climate change alters precipitation, storage, and flow patterns for the entire basin.

As in previous watershed planning efforts, the macro-mitigation strategies in the Addendum are aligned with longer-term efforts to manage water resources effectively in the face of these growing challenges, including:

- *Forest and Water Climate Adaptation Plan for the Nisqually Watershed* (Greene, 2014)
- *Nisqually Community Forest’s Upper Busy Wild Unit Forest Management Plan* (Nisqually Community Forest, 2016).
- *Nisqually Chinook Recovery Plan* (Nisqually Chinook Recovery Team, 2001)
- *Draft Nisqually Steelhead Recovery Plan* (Nisqually Steelhead Recovery Team, 2014).

Of these, the Chinook and Steelhead Recovery Plans provide the most comprehensive scientific framework, as well as the underlying rationale, for watershed-wide and basin-specific actions necessary to restore and sustain functioning riparian ecosystems for salmon.

Adaptive Management

The Plan Addendum identified mitigation strategies and preliminary policy recommendations designed to offset the impacts that new permit-exempt wells may have on streamflows or other senior water rights.

Also, in coordination with the Nisqually Salmon Recovery strategy, the Plan Addendum makes recommendations for habitat projects that will, in combination with the mitigation strategies, provide a Net Ecological Benefit (NEB) for streamflows in the Nisqually Watershed.

NPU, in adopting these recommendations, has good confidence that they will meet their mitigation offset and NEB/salmon recovery goals, but also recognize that estimates of rural growth and subsequent consumptive use may need to be modified and that some mitigation recommendations may yield different streamflow benefits than expected.

To address these uncertainties, NPU supports **adaptive management**:

- short- and long-term evaluation of the success of the recommendations and
- a commitment to modify, replace or supplement as needed, over the 20-year planning horizon, to meet the mitigation and NEB goals established in the plan Addendum.

Adaptive management recommendations from the NPU to Implementing Governments, Ecology or other entities will be subject to public review and approval through County legislative processes.

Habitat Projects

NPU's core strategy of major habitat projects which provide NEB mitigation is structured with built-in flexibility and expectations for ongoing adaptive management.

Table 4-1: Salmon Recovery Habitat Initiatives with Streamflow and Net Ecological Benefit

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

*Projects and quantification estimates discussed in Section 5.1.4 under county-led mitigation strategies.

Sub-Basin Mitigation Strategies

In the case of mitigation, the estimated per-connection consumptive use impacts are very small and it may not be possible to measure success directly (e.g., by measuring tributary streamflow).

The Planning Unit recommends a system of compliance monitoring.

Some of the micro-mitigation strategies may depend on policy development and implementation actions by the three counties. NPU acknowledges that the earlier (February 1, 2019) deadline means some of these actions will be further developed in coordination Streamflow Restoration Act processes in other WRIAs.

Possible that the counties may adopt an approach to mitigation that differs from this plan Addendum.

7.2 Summary of Watershed Mitigation Options

Table 7-2 summarizes three types of mitigation options or strategies proposed for the Nisqually Watershed; projects or regulatory situations that reduce the consumptive demand forecast, micro-mitigation strategies that are applied on a sub-watershed scale (Chapter 5), and larger scale salmon recovery projects associated with specific salmon recovery initiatives (Chapter 4). The total minimum and maximum mitigation expected from each of these strategies and for the entire watershed are also shown in Table 7-2. The timing of some mitigation benefits is year-round, while others are targeted summer and fall benefits.

Salmon Recovery Strategies	Mashel Watershed Community Forest	Forest Management, protection, acquisition, restoration	Mashel	Year-round	rate of purchase is linear and begins in year 1 - and compounds	1699	3798	2.347	5.246	Streamflow, habitat, ecosystem benefits, woody debris and sediment supply, erosion control	Funding, modeling uncertainties	Section 4.2.1 Tables 4-2 and 4-3 Appendix G
	Eatonville Capital Improvement Projects	Implementation of highest priority stormwater comprehensive plan projects	Mashel/Ohop ⁽¹⁾	Summer - Fall	0.639 - 1.843 AFY ⁽²⁾	38.7	38.7	0.128	0.128	Increased streamflow, improved water quality	Funding, modeling uncertainties	Section 4.2.2 Table 4-4 Appendix H
	Eatonville Water System Conservation	Leak detection and repair	Mashel	Year-round	N/A	69.35	69.35	0.096	0.096	Increased streamflow	Funding, unauthorized water uses	Section 4.2.2 Table 4-4 Appendix I
	Eatonville ASR	Capture high winter flows, recharge and store in the volcanic aquifer for recovery during high-demand season	Mashel	Summer - Fall	20 - 80 Acre-Feet ⁽²⁾	20	80	0.11	0.45	Increased streamflow	Funding, aquifer hydraulic properties, groundwater quality, ability to store water, impacts during recovery	Section 4.2.2 Table 4-4 Appendix H
	Eatonville Alternative Water Supply	Relocate Eatonville's water intake from Mashel River near town to mouth of Mashel River or Alder Lake	Mashel	Summer	95 Acre-Feet (0.8 cfs)	95	95	0.8	0.8	Increased streamflow	Funding, property ownership, right-of-way access, water quality	Section 4.2.2 Table 4-4 (Golder, 2010)
	Ohop Phase IV Floodplain Restoration & Protection	Floodplain reconnection and stream meandering, engineered log jams, revegetation	Ohop	Year-round	24.4 Acre-Feet/yr	24.4	24.4	0.0173	0.0173	Increase groundwater storage in floodplain, increased in-stream habitat, water quality improvements, increased streamflow during low flow season.	Project funding and land secured - low uncertainty	Section 4.2.3 Table 4-3 Appendix E
	Ohop Watershed Recovery/Community Forest	Forest Management, protection, acquisition, restoration	Ohop	Year-round	rate of purchase is linear, benefits are non-linear-begins in year 1 - and compounds	0	1112	0	1.5356	Streamflow, habitat, ecosystem benefits, woody debris and sediment supply, erosion control	Funding, modeling uncertainties	Section 4.2.1 Tables 4-2 and 4-3 Appendix G
	Bald Hills Watershed Recovery/Community Forest	Forest Management, protection, acquisition, restoration	Tobaton/Lackamas/Powell	Year-round	rate of purchase is linear, benefits are non-linear-begins in year 1 - and compounds	80.9	487	0.1117	0.6727	Streamflow, habitat, ecosystem benefits, woody debris and sediment supply, erosion control	Funding, modeling uncertainties	Section 4.2.1 Tables 4-2 and 4-3 Appendix G
	Upper Nisqually Recovery/Community Forest	Forest Management, protection, acquisition, restoration	Upper Nisqually	Year-round	rate of purchase is linear, benefits are non-linear-begins in year 1 - and compounds	0		0		Streamflow, habitat, ecosystem benefits, woody debris and sediment supply, erosion control	Funding, modeling uncertainties	Section 4.2.1 Tables 4-2 and 4-3 Appendix G
TOTAL						2470	8623	4.22	14.36			

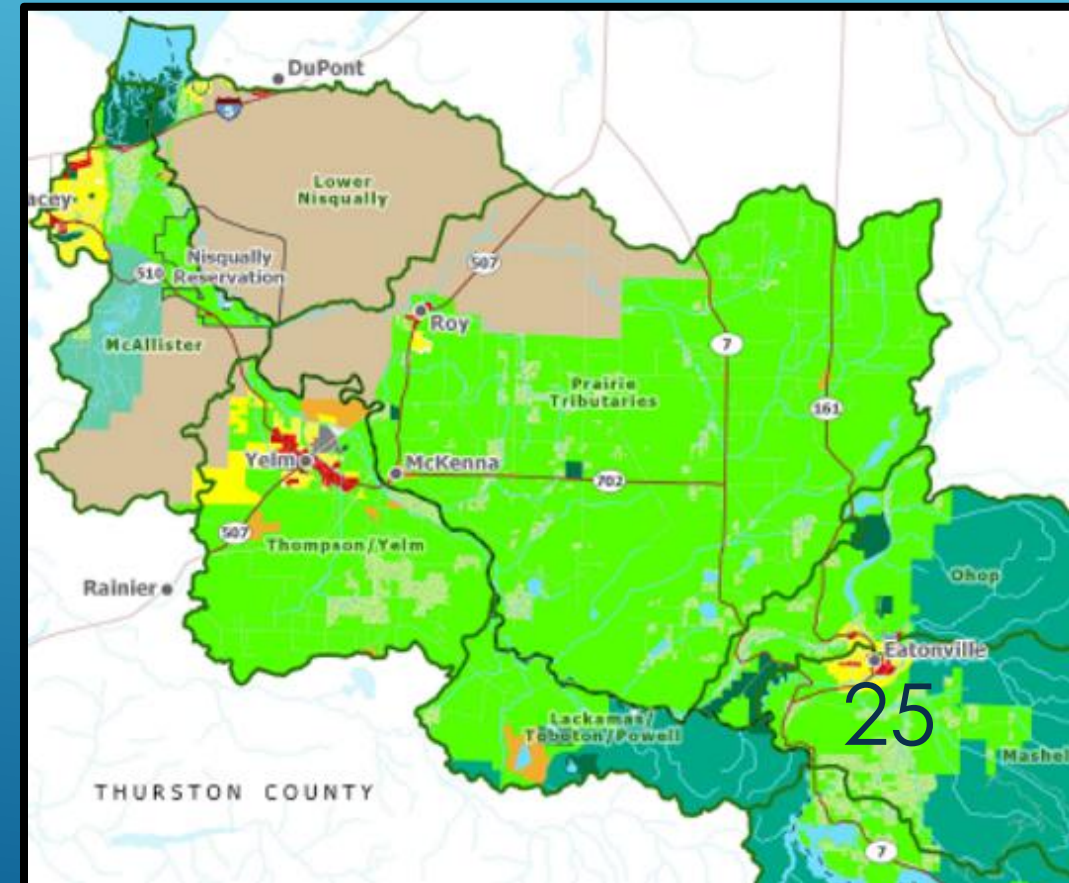
⁽¹⁾ All Eatonville CIP Projects are accounted for in Mashel Sub-basin (in actuality CIP 1&2 are in Mashel; 3&4 are in Ohop; 5&6 are on the divide between the two sub-basins)

⁽²⁾ Seasonal flow benefit only. CFS shows maximum seasonal benefit; Annual AF shows total benefit averaged over one year. See Chapter 4 and Appendices for assumptions.

Table 7-2: Summary of WRIA 11 Watershed Mitigation Options												
	Mitigation Strategy	Description	Sub-Basin(s)	Timing of Benefits	Project Assumptions	Annual AF Benefit (AF) MIN	Annual AF Benefit (AF) MAX	Streamflow Benefit (cfs) MIN	Streamflow Benefit (cfs) MAX	Ecological Benefits	Uncertainties	Reference
Demand Reduction	Yelm Offset Action 1	Connect new development in Yelm UGA to City water service using deep well	Thompson/Yelm	Year-Round	The consumptive use portion for each new P-E use would be reduced, depending on location and depth (up to 0.249 AF per connection).	240.5	240.5	0.33	0.33	Streamflow increases equal to the amount of consumptive water saved.	Water right permitting	Section 3.1.1 Appendix L
	Upper Nisqually Sub-basin regulatory status	Mitigation not required because sub-basin is not closed and ISFs are normally met	Upper Nisqually	Year-Round	49 Acre-Feet	49	49	0.067	0.067		Drought conditions could result in ISFs not being met	Section 3.3.8 Appendix B
Micro Mitigation Sub-Basin Strategies	Deep Groundwater Option 1	Complete new P-E wells only in deeper aquifers	All Sub Basins	Year-round	The consumptive use portion for each new P-E use would be reduced, depending on location and depth (up to 0.249 AF per connection).					Streamflow increases equal to the amount of consumptive water saved.	Funding, regulations, quantifying volume and timing of actual benefits	Section 3.1.1
	Deep Groundwater Option 2	Replace shallow P-E well withdrawals with withdrawals from deeper aquifers	Prairie Tributaries Thompson/Yelm Lackamas/Toboton/Powell	Year-round	The consumptive use portion for each P-E use that is replaced (0.249 AF per connection).					Streamflow increases equal to the amount of consumptive water saved.	Permitting, quantification of impacts and benefits	Section 3.1.1
	Deep Groundwater Option 3	Deepen PUD-managed Group A water system groundwater withdrawals.	Prairie Tributaries Thompson/Yelm Lackamas/Toboton/Powell	Year-round	The consumptive use portion for the Group A use would be reduced, depending on location and depth (up to 0.249 AF/connection).					Streamflow increases equal to the amount of consumptive water saved.	Funding, hydrologic conditions	Section 3.1.1
	Water Right Acquisition	Purchase and retire water rights	Prairie Tributaries	Irrigation season	Water right specific - Tier 1 only	0	673	0	0.93	Streamflow increases equal to the amount of consumptive water saved.	Funding for analyses and purchases, consumptive use volumes, water right owner willingness to sell.	Section 3.1.2 Appendix K
	Yelm Offset Action 2	Connecting existing Permit Exempt uses to Yelm's water service	Thompson/Yelm	Year-round	10% of existing wells replaced, consumptive use portion is credited (0.249 AF per connection).	10.4	10.4	0.014	0.014	Streamflow increases equal to the amount of consumptive water saved.	Assume 10 % of existing wells in service area, funding permitting	Section 3.1.1
	Yelm Offset Action 3	Infiltration of reclaimed Class A water to provide mitigation	Thompson/Yelm	Year-round	Additional recharge of reclaimed water	87	400	0.12	0.552	Streamflow increases equal to the amount of reclaimed water discharged to the shallow aquifer.	Funding, permitting, reclaimed water volume, site-specific factors	Section 3.1.1
	Pierce County Stream Restoration	Ditch removal with off channel storage, Beaver reintroduction, floodplain reconnection and stream meandering, re-vegetation	Prairie Tributaries	Year-round	Assume 0.0096 cfs/mile of linear channel and 6-60 miles	41.7	417	0.0576	0.576	Increase groundwater storage in floodplain, increased in-stream habitat, water quality improvements, increased streamflow during low flow/intermittent flow season.	Funding, land availability and access, limited data on potentially restorable areas and hydrologic conditions	Section 3.1.4 Table 3-6 Appendix E
	Thurston County Stream Restoration - Thompson/Yelm	Ditch removal with off channel storage, Beaver reintroduction, floodplain reconnection and stream meandering, re-vegetation	Thompson/Yelm	Year-round	Assume 0.0096 cfs/mile of linear channel and 1.6-16 miles	11.12	111.2	0.01536	0.1536	Increase groundwater storage in floodplain, increased in-stream habitat, water quality improvements, increased streamflow during low flow/intermittent flow season.	Funding, land availability and access, limited data on potentially restorable areas and hydrologic conditions	Section 3.1.4 Table 3-6 Appendix E
	Thurston County Stream Restoration - Lackamas/Toboton/ Powell	Ditch removal with off channel storage, Beaver reintroduction, floodplain reconnection and stream meandering, re-vegetation	Lackamas/Toboton/Powell	Year-round	Assume 0.0096 cfs/mile of linear channel and .23-2.3 miles	1.6	15.9	0.002208	0.02208	Increase groundwater storage in floodplain, increased in-stream habitat, water quality improvements, increased streamflow during low flow/intermittent flow season.	Funding, land availability and access, limited data on potentially restorable areas and hydrologic conditions	Section 3.1.4 Table 3-6 Appendix E
	Managed Aquifer Recharge	Diversion of higher winter streamflow for infiltration and storage	Mashe, Ohop, Prairie Tribs, Upper Nisqually, Lower Nisqually	Summer-Fall	Project Specific - assume 0-3 projects in 3 sub-basins @ 200 AF per project and 6 month benefit	0	1000	0	2.7626	Reduction in high flows, increases in low flows	Land availability, funding, permitting, water quality, site specific factors	Section 3.1.3 Appendix M
	Barrier Removal Projects	Culvert Replacement	Lackamas/Toboton/Powell	Year-round	Peissner Road Project 3.03 Acre-Feet (0.0023 cfs)	1.67	1.67	0.0023	0.0023	Re-open stream reaches & habitat, increase low flows	Funding, analyses, permitting	Section 3.1.4 Table 3-6

CONCLUSIONS - Why was the Plan Adopted

- Thus is the Nisqually Tribe's "home". They place a high value on salmon recovery projects, streamflow and natural resources protection and sustainable management.
- On the other hand, for Pierce, Lewis and Thurston Counties, population growth is expected to be lower in the Nisqually portion of those Counties than in other WRIAs (12,10, and 13 especially) that border WRIA 11.
 - The Prairie Tributaries (Pierce) and Yelm-Thompson (Thurston) sub-basins are where the future growth will occur and this growth is limited by more limited road access than the rest of Pierce and Thurston County.
 - The Lewis County portion of the Nisqually Watershed is forested and not expected to be widely accessible by new roads
- The geography and land-use in the Nisqually Watershed helped to focus attention to the critical parts of the Watershed where growth would occur and where (micro) mitigation offsets could also occur.
- Mainstem river flow is not an issue since it is managed by Tacoma Power's Alder Dam.
- Other parts of the Watershed (the upper part) are mostly undeveloped and has good potential for larger scale, long term mitigation and salmon enhancement projects.
- JBLM and the Billy Frank Jr. Nisqually National Wildlife Refuge keep a considerable part of the lower watershed unavailable for development.



CONCLUSIONS - Why was the Plan Adopted

- NPU members had a level of trust and understanding between themselves that is not always present in other similar committees.
- NPU had successfully adopted the Nisqually Watershed Plan in 2003 [under RCW 90.82] and they saw this effort [under RCW 90.94](even though all of the individual representatives were different (except 2 individuals)) as just a continuation of the previous successful effort.
- NPU members agreed to a “macro-mitigation” and “micro-mitigation” approach that helped everyone focus on sub-basin specific possibilities and basin-wide long term possibilities.
- Ecology held to the February 1, 2019 “adoption date” that is specified in RCW 90.94. The clear message was either submit a plan for adoption or Ecology would go to rule-making.

Lessons for Success

- Leadership
- A really good facilitator
- Trust among partners
- It's hard work – take it seriously
- Translating between languages: water rights, salmon recovery, flood management, growth planning
- Treat this process as the opportunity it is to reach for some big goals



**DEPARTMENT OF ECOLOGY'S
ORDER
ADOPTING THE UPDATED WATERSHED PLAN
FOR WATER RESOURCES INVENTORY AREA 11 (NISQUALLY)**

In accordance with the Streamflow Restoration Act, RCW 90.94.020, the Department of Ecology (Ecology) received the Addendum to the Nisqually Watershed Management Plan (WRIA 11 Updated Plan) submitted by the Water Resources Inventory Area 11 Planning Unit on January 18, 2019.

Ecology has reviewed the WRIA 11 Updated Plan to determine whether it meets the requirements for adoption under RCW 90.94.020(4). As part of this review, Ecology staff conducted a technical review of the WRIA 11 Updated Plan, and produced a report entitled the "Washington State Department of Ecology Water Resources Program Technical Review of Nisqually Watershed Response to the 2018 Streamflow Restoration Act (RCW 90.94) - Addendum to the Nisqually Watershed Management Plan," dated January 23, 2019¹. This technical report supports Ecology's decision on the WRIA 11 Updated Plan and is incorporated into this Order by reference.

Ecology's Water Resources Program, through its Program Manager, issued a Memorandum to Ecology's Director dated January 24, 2019, delivering the Program's Recommendation to Adopt, with Conditions, WRIA 11 (Nisqually) Watershed Plan Addendum. This Memorandum supports Ecology's decision on the WRIA 11 Updated Plan and is incorporated into this Order by reference.

Under RCW 90.94.020(4)(c), "[p]rior to the adoption of the updated watershed plan, the department must determine that actions identified in the watershed plan, after accounting for new projected uses of water over the subsequent twenty years, will result in a net ecological benefit to instream resources within the water resource inventory area."

Ecology finds that the WRIA 11 Updated Plan's projection of 2,987 new wells being installed over the twenty-year period, resulting in 1.03 cubic feet per second (cfs) of new consumptive water use, is based on sound methodology. In particular, the Planning Unit selected figures derived from application of a method to calculate consumptive water use that was based on guidance provided by Ecology, rather than an alternative method that would indicate a lower estimate of consumptive water use.

Ecology further finds that, with appropriate conditions to provide reasonable assurance that actions will be carried out, the 22 different actions, i.e. projects, identified in the WRIA 11 Updated Plan are sufficient to offset consumptive use impacts to instream flows that would be caused by the 1.03 cfs of new consumptive water use that is projected to occur throughout the watershed over the twenty-year period.

¹ Minor wording changes were made on January 29, 2019 that did not change the overall technical conclusions.

Ecology's technical review segregated the projects into three categories, or "tiers," to reflect the relative probability that benefits will be achieved, based on apparent certainty of a strategy occurring, along with certainty of projected benefits if the strategy does occur. Offsetting consumptive use impacts can be achieved through a variety of combinations of strategies in Tiers 1, 2, and 3. Overall, there is flexibility in how offsetting potential consumptive use impacts to instream flows can be accomplished.

Ecology finds that projects in Ecology's "Tier 1" (most certain) category include the following strategies that, when totaled, are projected to offset 2.114 cfs of stream flow impacts, or slightly more than double the 1.03 cfs potential consumptive use impacts to instream flows projected to occur in the basin over the next 20 years:

Ecology Staff "Tier 1" Project List	
WRIA 11 Plan Action	Projected Offset (CFS)
Yelm Offset Action 1 – Connect New Development in Yelm UGA to City Water Service (Deep well)	0.33
Water Right Acquisition(s)	0.093
Yelm Offset Action 2 - Connect Existing Development on Permit-exempt Wells in Yelm UGA to City Water Service and Decommission Permit-exempt Wells	0.014
Managed Aquifer Recharge (MAR) Projects	1.66
Ohop Phase IV Floodplain Restoration & Protection	0.0173

After evaluation of the WRIA 11 Updated Plan to determine that it identifies strategies to offset all potential consumptive use impacts to instream flows, Ecology evaluated the WRIA 11 Updated Plan for additional strategies necessary to achieve a net ecological benefit. Reviewers considered the unique hydrogeological characteristics of the basin, locations of projected new permit exempt domestic wells, and habitat benefits of the 22 strategies described in the WRIA 11 Updated Plan. While most of the consumptive use associated with new permit-exempt domestic wells will occur in the lower part of the watershed, a high percentage of the Tier 1 habitat projects are located further upstream and are connected to habitat features in the upper portions of the WRIA that are most valuable for fisheries. This relationship contributes significantly to benefits associated with these projects.

Therefore, **Ecology finds** that, with appropriate conditions, the WRIA 11 Updated Plan meets the requirement "that actions identified in the watershed plan, after accounting for new projected uses of water over the subsequent twenty years, will result in a net ecological benefit to instream resources within the water resource inventory area."

Based on the foregoing, Ecology **ADOPTS** the WRIA 11 Watershed Plan Update, with the following **CONDITIONS**:

1. Annual Reporting

- a. The planning unit is required to prepare and submit a brief (fewer than 10 pages) mainly narrative report to Ecology by June 1 of the year following plan adoption, and every year thereafter during the planning horizon period, describing:
 - i. Plan implementation actions to date.
 - ii. Any changes in approach since the last report.
 - iii. Any significant implementation challenges identified that will require a change in approach.
 - iv. Specific information regarding the Tier 1 actions that Ecology relied on in adopting the plan:
 1. Yelm Offset Action 1 – Connect New Development in Yelm UGA to City Water Service (Deep Well): Status of the permit application process, including progress on preparing a draft Report of Examination for review by Ecology.
 2. Water Right Acquisition: Status of any efforts to identify and acquire suitable water rights for transfer to the state trust water right program for instream flow purposes.
 3. Yelm Offset Action 2 - Connect Existing Development on Permit-exempt Wells in Yelm UGA to City Water Service and Decommission Permit-exempt Wells: Status of progress on decommissioning wells and connecting homes which previously used domestic wells to the City's water system.
 4. Managed Aquifer Recharge (MAR) Projects: Status of feasibility studies for project(s) that contribute toward offsetting consumptive impacts and achieving net ecological benefit.
 5. Ohop Phase IV Floodplain Restoration & Protection: Status of project implementation.

2. Five-year Self-Assessment

- a. The planning unit is required to prepare and submit to Ecology by June 1, 2024, and every five years thereafter during the planning horizon period, a detailed description of:
 - i. project implementation; and,
 - ii. a calculation of quantity of water and instream flow benefits realized through implementation of projects identified in the WRIA 11 Updated Plan.
- b. Ecology may review the self-assessment to determine if any modifications to the conditional adoption of the WRIA 11 Updated Plan are necessary.

3. Ongoing Compliance with RCW 90.94.020(5)

- a. Planning unit governments will continue to fulfill the requirements of RCW 90.94.020(5) - which include recording relevant restrictions on titles, and recording and reporting the number of building permits issued by the County – after Ecology's adoption of the WRIA 11 Updated Plan.

Neither this decision to adopt the updated watershed plan, nor the inclusion of any conditions in this approval, provide any guarantee that Ecology will approve any requests for project funding.

So ordered this 1st day of February, 2019.



Maia D. Bellon, Director
Department of Ecology

Enclosure: Your Right to Be Heard

YOUR RIGHT TO APPEAL

You have a right to appeal this Decision to the Pollution Control Hearings Board (PCHB) within 30 days of the date of receipt of this Decision. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do all of the following within 30 days of the date of receipt of this Decision:

- File your appeal and a copy of this Decision with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Decision on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

ADDRESS AND LOCATION INFORMATION

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey WA 98503	Department of Ecology Attn: Appeals Processing Desk PO Box 47608 Olympia WA 98504-7608
Pollution Control Hearings Board 1111 Israel Road SW, Suite 301 Tumwater WA 98501	Pollution Control Hearings Board PO Box 40903 Olympia WA 98504-0903

For additional information visit the Environmental Hearings Office Website: <http://www.eho.wa.gov>
To find laws and agency rules visit the Washington State Legislature Website: <http://www.leg.wa.gov/CodeReviser>