

October 1, 2021

Co-Chair Senator Keith Wagoner; Washington State 39th Legislative District

Co-Chair Representative Debra Lekanoff; Washington State 40th Legislative District

RE: ESSB 6095: Water in the Skagit Basin Sources and Uses, Present and Future Revised Story Map, and Peer Review of the Duke Estuary Study

Dear Senator Wagoner and Representative Lekanoff,

Thank you for your continued involvement and support of the Skagit Water Task Force. We have reviewed both the Washington State Academy of Sciences (WSAS) Independent Peer Review of the Estuary Study Portion of the 1999 Duke Engineering “Final Technical Report: Lower Skagit River Instream Flow Studies” (WSAS Peer Review) (WSAS 2021), and the Skagit Water Supply and Demand Synthesis: Story Map Series (Story Map) (Yoder et al. 2021) prepared for the Task Force. Based on this review, we have prepared several follow-up topics for discussion during the October 4, 2021, task force meeting as it pertains to next steps.

Story Map

- Differentiation and specificity regarding the term “scarcity”
- Distribution of Floodplain Sensitive Species in the Skagit
- Clarification of future municipal/residential demand estimates

WSAS Peer Review

- Follow-up regarding use of averages
- Scope of work to address key issues

Story Map: Differentiation and specificity regarding the term “scarcity”

The Story Map includes the following caption:

“Water is a scarce resource. People would often prefer more of it than is available for instream and off-stream uses, especially at certain times and places. Water scarcity is a condition of wanting more water than is available at any given place or time (Jaeger et al. 2013). Water insecurity relates to the degree of uncertainty over and risk of bearing negative consequences from unexpected water scarcity. As with scarcity itself, water insecurity depends not only on weather and other natural variables, but on law, regulation, and water rights.”

We respectfully request Water Task Force members consider additional revisions to the Story Map to define scarcity more clearly and precisely. Specifically, we request the authors to

synthesize and present the existing data and information in a manner that more clearly differentiates between scarcity and insecurity due to “*law, regulation, and water rights*” versus scarcity and insecurity due to “*weather and other natural processes.*” In support of this request, we ask that Water Task Force members consider the following additional points.

Better understanding of demand

To fully understand scarcity, it is important to have a clearer picture of water demand. We urge Task Force members to request the State of Washington Water Research Center (WWRC) team to build upon their current synthesis to screen the water rights database and include claims. This is critically important because claims make up a super-majority of the water right authorizations in WRIA 3 and 4 and are a significant source of uncertainty in understanding the water budget.

We ask that Water Task Force members request the WWRC to prepare a scope of work to perform a simple GIS screening technique that can be used to separate potentially valid claims from those that may not be valid. We realize that only an adjudication can formally evaluate claims, but there is room to make better generalizations about the magnitude of this water right authority than simply omitting them.

1. For example, the priority date of all surface claims after 1917 (or after 1932 if listed as riparian on the claim) and all groundwater claims after 1945 could be omitted as potentially invalid because they post-date the adoption of the surface and groundwater codes.
2. For claims that were mapped by Ecology, screening that includes a GIS comparison of their *places of use* to identify likely overlaps with certificated water rights could be completed to avoid double-counting.
3. The balance of claims should be included to better reflect likely water right authority in the basin. We understand there is some risk that this number is still too high (e.g., claims may have been relinquished due to nonuse), but it will better inform the overall authority question than the current process where the largest potential authority is entirely unquantified.

We would also like to see water demand be reported using several methods, starting with the current method, and then reporting a range based on screening protocols, demand, consumptive use, and future demand.

Scarcity related to “*weather and other natural processes*”

Based on our review of the Story Map (Big Picture Figures 4, 5, and 6), we have concerns related to the use of scarcity as applied to “*weather and other natural processes.*” In an effort to better understand scarcity, we converted values for water supply and demand from the Story Map to cubic feet per second (cfs) for comparative purposes. As shown in Table 1, July, August, and September have the lowest average flow rates and correspond to periods of time

when “*weather and other natural process*” would most directly affect water supply and thus scarcity.

Table 1. Summary of Values from Story Map Big Picture Graphics

Category	Flow Rate (converted ac-ft/month to cfs)				
	Oct.	Jun.	Jul.	Aug.	Sep.
Skagit River	12,424	22,313	16,633	9,686	8,094
Agricultural water use	0	97	254	236	6
Exempt water use	7	7	8	8	7
Municipal water use	52	54	67	73	63
Domestic water use	38	42	47	47	42
Sub-total	96	200	376	363	118
Percentage of river flow	0.77%	0.90%	2.26%	3.75%	1.46%
Increase in PSE summer discharge (after 2006)			920	920	
Estimated USGS Mount Vernon Gage			+/- 333	+/- 194	+/- 162

The low-flow periods in July, August, and September occur naturally due to the climate of the Skagit watershed and more generally the Pacific Northwest. Compared to other rivers in Washington, the Skagit has relatively high volumes of water during summer months. In addition, the natural water supply in the Skagit River, as shown in Table 1, is nearly two orders of magnitude greater than the estimated demand, which makes it difficult for us to understand how natural processes lead to scarcity of water as a resource.

Due to the large difference in magnitude of supply as compared to demand, we believe it is important for the authors to provide a summary of the relative error when estimating water supply and demand. Based on our literature review, the USGS indicates discharge estimates usually have a 2 percent error; at 10,000 cfs, this would be plus or minus 200 cfs, which is similar in magnitude to the estimated summer withdrawals in the Revised Story Map.

Based on our review, we request that Water Task Force members ask WWRC to make additional revisions to the Story Map product to provide more clarity regarding “*weather and other natural processes*” relative to demand when they define scarcity and include a discussion of relative error.

Scarcity related to “water rights”

In addition, we also believe it is important for Water Task Force members to better understand the importance of “*law, regulation, and water rights*” as they individually relate to scarcity of water for instream and additional consumptive uses. In particular, we have several questions related to the importance of water rights. Table 1 summarizes the estimated monthly water use based on water rights during summer months; the period of time when WWRC highlights

scarcity being of highest concern. Again, water use is approximately 4 percent of the total river flow, during the low flow season, and may be less if actual demand or consumptive use are reported.

Furthermore, as shown on BP-Map 3, many of these diversions occur downstream of the USGS gage in Mount Vernon in the tidally influenced portion of the river, which means they have no effect on upstream water rights or the river flows measured at the USGS gage. We request that the WWRC summarize water demand both above and below the USGS gage and illustrate the spatial distribution of water use and diversions to provide more clarity on where water rights results are causing scarcity of water supply. As is, we believe there is the potential for the Story Map audience to draw improper conclusions regarding the effect of out-of-stream diversions on instream flows.

In addition, it is our understanding that Puget Sound Energy (PSE) actively manages their Baker facilities to re-time summer hydrographs. The current PSE FERC license issued in 2006 requires PSE to discharge 920 cfs more water during summer months as compared to the requirement prior to 2006 and prior to the study period for the 2001 Instream Flow Rule.

As shown in Table 1, based on our review, the PSE required discharge rate is nearly three times more than all of the existing water rights combined. We request that WWRC summarize water demand below the Baker River as compared to the input from PSE in order to clarify the use of “scarcity” as it pertains to “*water rights*” given this important role of hydropower. We believe it would also be helpful to show a pre- and post-2006 hydrograph of a similar water year (e.g., a year when average runoff is similar) to show the effect of this major change in river operations.

[Story Map: FH-Map 1. Distribution of floodplain sensitive species in the Skagit Basin](#)

FH- Map 1 declares that “Distribution includes some inaccessible artificial ditches in the lower river and delta below Mt Vernon.” We are concerned that FH-Map 1 and the associated text does not synthesize all available published data and maps government agencies with jurisdictional authority use to classify the waters of the state in the lower Skagit River. We request that WWRC work with staff from WDFW and NOAA Fisheries to revise FH-Map 1 to remove artificial ditches as critical freshwater habitat for all salmonid species.

[Story Map: Clarification of future municipal/residential demand estimates](#)

Based on our review of the 2040 municipal water demand estimates and the municipal inchoate water supply (BP Figure 5 and Residential Demand), we request that additional analyses be performed as to it pertains to forecasted growth and municipal/residential water demand. It is our understanding that the municipal water suppliers have service areas, and possible agreements, that extend outside the current boundaries of the study area. We believe it is important to have a more comprehensive and spatially explicit understanding of growth projections and future municipal/residential water demand.

[WSAS Peer Review: Additional information regarding use of averaging](#)

The 1999 Duke Study is currently the basis for two key elements of the 2001 Instream Flow Rule as it pertains to the estuary. Table 5.4-1 of the Duke Study recommends flow rates and total maximum allocation for the Skagit River that extend downstream of the USGS gage in Mount Vernon to Skagit Bay.

The WSAS Peer Review stated that one of the issues with the Duke Study was that the *“habitat analysis was conducted using a February to August time period and the analysis was averaged over this time period to develop a single recommended flow level”* (WSAS 2021). Based on our review of the Duke Study, it appears that the recommendation for 10,000 cfs in the lower river was intended to optimize instream flows for chinook and steelhead rearing at cross sections located upstream of the tidally influenced portion of the river. According to Section 5.1.1.3 of the Duke Study, the Committee determined that the best way to balance rearing habitats of these target species was to *“weight the habitat available for each species equally.”* According to Table 2.3-4 the optimum flow rate for steelhead rearing is 26,000 cfs and the optimum flow rate for chinook is 7,500 cfs.

Based on our review of USGS Skagit River Mean Daily Discharge statistics for the Mount Vernon gage¹ there are no optimum flows, as defined by the Duke Study, for steelhead rearing in August or September (Figure 1).

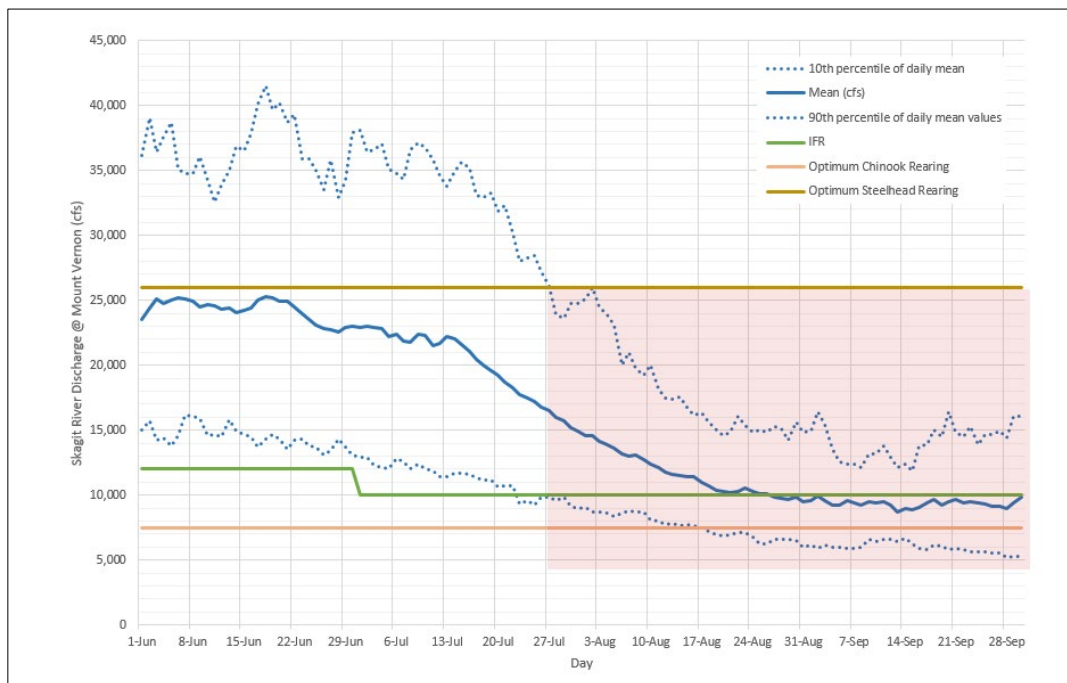


Figure. 1 USGS Skagit River Mean Daily Discharge Statistics 1940-2018.

¹ USGS Gage 12200500 period of record 10/1/1940 to 9/30/2018

We request that Water Task Force members authorize the WSAS perform a review of the method used to support the recommendation of 10,000 cfs to establish the instream flow for the river below the USGS gage in Mount Vernon in the estuary. We are concerned that the use of averages associated with flows that don't occur in the river is an unrealistic method for establishing regulatory flows in the estuary.

WSAS Peer Review: Scope of work to address key issues

We also request that Water Task Force members authorize the WSAS to develop a scope of work for an additional study that would address *“several issues with the study’s methods”* as summarized in Section 1 of the Peer Review, including *“the methods used in watershed site selection, data collection and use, water level and tidal data analysis and evaluation of low-flow conditions, measures of water quality, evaluation of fish ecology and habitat, and modeling.”*

As part of that process, we request the WSAS, or other recommended experts, be asked to present currently available physical and/or biological modeling methods, data, and tools which can be used to address the concerns identified by WSAS.

Once Water Task Force members have a better understanding of the currently available physical and/or biological modeling methods, data, and tools, we believe it will be important for Water Task Force members to work with the WSAS to establish study objectives and to refine a scope of work to address key concerns identified by WSAS.

Thank you for your consideration of our comments. We appreciate the opportunity to continue to provide comments and requests for additional studies. As always, we are available for additional discussion/follow-up questions and look forward to the meeting in October.

Sincerely,



Jenna Friebel
Executive Director
Skagit County Drainage and Irrigation Districts Consortium
jfriebel@skagitdidc.org
360-708-0344



Allen Rozema
Executive Director
Skagitonians to Preserve Farmland
allenr@skagitonians.org
360-336-3974

References

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