

	Technical Expertise Needed				
	Priority Concerns	Estuarine Ecologist	Fresh Water Biologist	Engineers	Other
I. List of Concerns about a Swinomish Diversion Channel					
Salinity/Outlet Structure					
■ Will salt water intrusion be a problem? Will a tidegate be required to prevent salt water intrusion? If yes, how will this reduce the quality of the available channel habitat? Are there alternatives other than tidegates to prevent intrusion? For example, could a 15-20 foot ditch filled with clay be used to prevent intrusion, although that might be an expensive alternative?	X	X	X	X	X
■ How will the design of the channel encourage or discourage salt and fresh water mixing? How would salinity affect the quality of water and habitat in the channel and the surrounding farmland?	X	X	X	X	X
■ How far might salt intrude around the salt marsh at the diversion outlet?					X
■ How will salinity affect the quantity of habitat for different fish species?		X	X		
■ What is the appropriate level of modeling to determine salinity and hydrologic changes?		X	X	X	X
■ How will the diversion affect salinity in the Swinomish? Lower salinity in the Swinomish would be beneficial to fish.					X
Flow in the Diversion					
■ Where does the year-round low flow come from? Are the flows in the diversion subject to in stream flow requirements? Is the diversion legally considered a consumptive use of water?	X				X
■ Will the sediments in the channel support surface flows, or will the water seep into the ground?	X			X	X
■ Are there total maximum daily load (TMDL) concerns?					X
■ How will the amount of water in the diversions be determined?		X	X	X	X
■ How does the diversion affect the groundwater regime?				X	X
■ How can the engineers guarantee that the main body of the river will not flow down the diversion channel during a flood event?				X	
■ What is the likelihood of catastrophic failure, and how do you ensure against it?				X	
■ How will the amount of water in the floodplain be regulated?				X	X
Fish Passage/Inlet Structure					
■ How will the fish passage structure function?	X	X	X	X	
■ How will the water and fish flow into the diversion during low flow? Would that necessitate moving water up hill?	X		X	X	

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I. List of Concerns about a Swinomish Diversion Channel					
■ Where along the bend will the inlet for the diversion be? Both the configuration and location of an inlet structure could have huge effects on the potential for fish passage. Where the inlet structure currently is for Alternatives 1 and 2, there is sufficient large wood debris to cause fish to congregate.			X	X	X
■ How is the diversion going to change over time? Although the inflow for the diversion may be located at a place favorable to fish now, what is it going to look like in 20 years?			X	X	X
■ Will the gate allow woody debris to flow into the channel at high and/or at low flow?			X	X	
Channel Design					
■ How will numbers of returning adult fish be assessed and monitored?	X		X		
■ Will a viable riparian zone be feasible along Highway 20 as planned in Alternative 7?			X		
■ Is it possible to design refugia for fish during high-flow events in the diversion? For example, could beads or meanders be designed in the channel?			X	X	
■ Would it be possible to incorporate wetlands within the footprint of the diversion?			X	X	X
■ How would wood be placed/recruited into the channel?			X	X	
■ Is it possible to incorporate Sullivan Slough or others into the design? Can some water be diverted to Big Indian slough?			X	X	
■ How will grade control structures function and allow for natural function of the river?				X	
■ What is the relationship between the current bypass and historic sloughs and wetlands?	X				
■ Is it possible for the diversion to divide as it comes toward the outlet, thus imitating a more natural and historic course?	X			X	
■ Can the riparian zone go beyond the 500-foot wide buffer?			X	X	
■ What will the land use be within the 2000-foot diversion and how will it be regulated?			X	X	X
■ What will be the construction impact of the diversion?	X		X	X	X
Sedimentation					
■ At high flows, where will the sediment in the diversion be deposited?				X	X

Priority Concerns	Technical Expertise Needed			
	Estuarine Ecologist	Fresh Water Biologist	Engineers	Other
I. List of Concerns about a Swinomish Diversion Channel				
■ How will the outflow impact the Swinomish Channel and the Reservation (including Marina Site)? Will there be sedimentation changes, which might cause navigation problems?			X	X
Land Use				
■ How will land uses be regulated outside the diversion, especially in light of the removal of the 100-year floodplain designation for the surrounding area?				X
■ Currently, there are sloughs in the area of the diversion. With the potential for increased development in the floodplain, how will their water quality be affected?				X
■ How will a diversion change FEMA maps?			X	X
Other Considerations				
■ How will the sport and commercial fish harvest change as fish travel along a narrow diversion channel?				X
■ Will other sloughs still be opened up as mitigation?				X
Downstream Effects				
■ If water for the diversion comes from the Skagit, what will be the downstream salinity effects in the Skagit?	X			X
■ If you take water out of the Skagit, how will temperature and habitat quality on the lower Skagit be affected? This is particularly important to bull trout, which are more sensitive than Chinook.	X	X		X
■ If water for the diversion comes from the Skagit then what will be the downstream sedimentation effects in the Skagit?			X	X
■ What will the standard maintenance practices be for the channel during low-flow?		X	X	
■ What will maintenance needs be after a flood?		X	X	
■ Setbacks offer reduced maintenance costs, and therefore would be financially advantageous to include with the diversion alternatives.				

Technical Expertise Needed

II. List of Concerns about Overtopping	Priority Concerns	Estuarine Ecologist	Fresh Water Biologist	Engineers	Other
<i>Fish Losses</i>					
■ What will be the number of fish lost due to overtopping and catastrophic failure? Assume all fish going over the overtopping structure will be lost (take involved), and no return mechanism is planned.			X	X	
<i>Construction Impacts</i>					
■ What impacts will occur from construction in the river?			X	X	X
<i>Long Term Effects</i>					
■ What are the long-term effects of riprap in the river?			X		X
■ How will eliminating any floods over 25-year flood stage change the way that the river develops? Many important habitat features are formed in large flood events.			X		X
■ Would the additional federal involvement in the levee system preclude additional restoration projects? Will breaches still occur with overtopping?			X	X	X
<i>Water Quality</i>					
■ The water will pick up additional waste (including pesticides and other hazardous waste) as it travels over the area farms. How will this be dealt with?			X	X	X
■ Might overtopping be considered a consumptive use?					X

III. List of Concerns about Levee Setbacks	Technical Expertise Needed				
	Priority Concerns	Estuarine Ecologist	Fresh Water Biologist	Engineers	Other
Riprap Disposition					
■ What will happen to the riprap on the river?	X			X	X
■ Is the 500-foot setback measurement from the toe of the levee or the middle? How much increased area free of riprap will the river be able to meander in? Would the river be able to meander from levee to levee?				X	X
■ Would removal of 50-75% of the riprap allow the river to meander naturally?				X	X
■ Will setbacks be placed at the outside of the river's curves to maximize habitat quality?			X	X	X
■ What will be the construction impacts?			X	X	X
Buffer					
■ How much planting could be allowed in the riparian buffer? Could trees be part of the plantings?			X	X	
■ What would the maintenance plans be for the buffer?			X	X	
■ Will the buffer be set as the river changes?			X	X	
Channel Morphology					
■ How will the channel react to the setbacks? Will a Geomorphologist examine the plans?			X	X	X
■ What would happen to the sediment from eroding riverbanks before stabilization?			X	X	X
Other					
■ What will be done with the landfill in West Mount Vernon?				X	X
■ How will water temperature be affected by a wider channel?			X		X
Land Use					
■ How will land uses be regulated in light of the removal of the 100-year floodplain designation for the surrounding area?					X
■ Will the alternative preclude the restoration of sloughs previously cutoff from the main channel?			X	X	X
■ Currently, there are sloughs in the area lower valley. With the potential for increased development in the floodplain, how will their water quality be affected?					X
■ How will setbacks change FEMA maps?				X	X

IV. Samish Diversion	Technical Expertise Needed				
	Priority Concerns	Estuarine Ecologist	Fresh Water Biologist	Engineers	Other
Concerns for this alternative were not scoped because it was felt that there were too many negatives about this option particularly the potential mixing of stocks. Before this option is completely dismissed we have to agree that an on average once every 25 year use of the bypass would cause a detrimental loss of chinook and bull trout stocks due to mixing even though it would be infrequent, and the water quality impacts to Samish Bay would be a show stopper.	X	X	X	X	X
Would NMFS actually issue a jeopardy determination for the Samish Bypass?		X	X		

At the previous meeting, Kurt had been the only person voicing support for the Samish diversion option. Although he could not be present at the meeting, Brendan read a few items from him. He thought that the Samish diversion alternative would be an opportunity to return to historic patterns flooding patterns during which the Samish was part of the Skagit floodplain. Also, many sloughs are located in the Samish area that could be reopened. Since Brendan had not had the chance to discuss the items with Kurt, he could not comment further. He did mention that even if the Samish option were not selected, some of the sloughs there could be restored as mitigation for construction impacts. Although they were not suggesting eliminating it, Brendan did not believe that this option was favored by WDFW.