

BAKER RIVER PROJECT RELICENSE

Aquatic Resources Working Group Technical Sub-committee on Instream Flows

April 22, 2002
8:30 a.m. – 4:30 p.m.
Washington Department of Ecology
Bellevue, WA

DRAFT MEETING NOTES

Fish Team Leader: Arnie Aspelund, 425-462-3442, aaspel@puget.com

PRESENT: Arnie Aspelund (PSE) Nick Verretto (PSE), Bob Barnes (PSE), Cary Feldmann (PSE), Brady Green (USFS), Jutta Marissayli (USFS), Dean Grover (USFS), Thom Hardy (Watershed Systems Group), Hal Beecher (WDFW), Brad Caldwell (DOE), Bob Wright (DOE), Rod Sakrison, (DOE), Steve Fransen (NMFS), Sue Madsen, Joetta Zablotney and Phil Hilgert (R2), Gary Sprague (WDFW), Ruth Mathews (The Nature Conservancy), Don Schluter (Trout Unlimited, by phone), Dee Endleman (Agreement Dynamics), Lyn Wiltse (PDSA), and Dawn Schink (PSE)

Note: If unable to attend meetings, please notify Team Leader. If something comes up on the day of the meeting, call Lyn at her new cell phone number: 425-890-3613.

FUTURE DATES AND LOCATIONS: A technical teamlet consisting of Phil Hilgert (R2), Hal Beecher (WDFW), Brad Caldwell (DOE), Thom Hardy (Watershed Systems Group), Cary Feldmann (PSE) and when available Steve Fransen (NMFS) will meet before the end of May to outline a study approach and report at the next Aquatics Workgroup meeting.

AGENDA
April 22, 2002
8:30 a.m. – 4:30 p.m.
Department of Ecology- Bellevue, WA

8:30-8:40	Introductions (Cary)
8:40-8:50	Review Agenda (Phil)
	Review existing and potential information sources:
8:50-9:05	Lower Skagit River Instream flow study (DOE)
9:05-9:20	Upper Skagit River Settlement Agreement (Steve)
9:20-9:45	Middle Skagit Habitat Recon May 2000 (Sue & Phil)
9:45-10:10	A-24 Hydrology and Geomorphology (Sue)
10:10-10:20	Break
10:20-10:45	A-09 Biological Studies (A-09B, A-09C, A-09D) (Phil)
10:45-11:30	Review USFS instream flow study method (Thom)
11:30-noon	Lunch (box lunches provided)
Noon-12:30	Review other instream flow study alternatives (Phil)
12:30-4:00	Evaluation of instream flow study components (Phil)
4:00-4:15	Next step (Cary)
4:15-4:30	Schedule and set agenda for next meeting, meeting evaluation (Lyn)

LOWER SKAGIT RIVER INSTREAM FLOW STUDY

Phil briefly reviewed the methods employed in the instream flow study recently conducted in the Lower Skagit River and estuary.

- Rod reported that the DOE instream flow regulations developed from the study identify limits to future water rights but does not affect existing water rights.
- Gary wanted to know if steelhead were addressed in the lower river study. Analyses of spawning flows used the results from a few transects specifically located at spawning areas.
- Rod noted that occasional flooding of the estuary was identified as necessary to protect estuarine processes.
- Rod stated that the instream flow rule was set at levels that would not necessarily be available under at all times under unregulated flow conditions.

UPPER SKAGIT RIVER INSTREAM FLOW STUDY

Phil reviewed results of the instream flow and ramping rate analyses conducted in the 1980s for Seattle City Light's Skagit River Project (FERC No. 553).

- Steve added that the results from the 1982 PHABSIM study were not particularly helpful in reaching settlement. They ended up developing an effective spawning habitat model that helped bring about a flow settlement.
- Rod clarified that Skagit Project instream flows involve management of an annual water budget that addresses both power production and fish life history requirements.
- Gary added that the regulatory agencies incorporated follow-up monitoring and testing of the flow releases to confirm the flows needed to protect incubating salmonid eggs.

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- Rod stated that the approaches to identifying and managing instream flows in the upper and lower river reaches are completely different, almost as if they were two different rivers.

MIDDLE SKAGIT RIVER STUDIES

Phil and Sue reviewed the studies that have already been started. They showed a PowerPoint presentation of a 3-day reconnaissance-level survey of the middle reach (Baker River confluence to Hamilton boat launch) conducted in May 2000 as a way of introducing discussions of the middle Skagit River. The study request/study plan/implementation procedure that was established as the Baker relicensing process was reviewed and studies relevant to instream flow were highlighted. Phil was asked why the recon survey was stopped at Hamilton instead of continuing down to Sedro-Woolley. Phil responded that they wanted to survey the river under stable flows. They only had a couple of days when the Baker and Skagit Project flow releases were going to be stable to conduct the study. As it turned out, rainfall and snowmelt in the upper Sauk River valley caused flows to fluctuate from 11,000 to 17,000 cfs anyway. In addition, the effects of the Baker Project lessen farther down river.

STUDY A-24 HYDROLOGY AND GEOMORPHOLOGY

Sue reviewed the objectives of the study and presented the results of the hydrological analyses portion of the study as a PowerPoint slide show.

- Hydrological analyses followed the IHA process (Indices of Hydrologic Alteration). Utilizes measured and simulated flow data to identify changes in Magnitude, Duration, Timing and Frequency of various flow components.
- Steve asked about flow fluctuations on the essentially unregulated Sauk River. Sue showed the results of statistical analyses of downramping data (Slide 13).
- Sue and Phil believe that IHA analyses do not answer how rivers should be managed, but help identify what flow patterns to evaluate.
- Gary, referencing Slide 7, would like the numbers calculated for present day, 1981 to 1996.
- Ruth supported the use of the IHA assessment to evaluate different flow conditions and pointed out that simulated runs can be done and might be helpful.
- Rod noted that the IHA results indicate that Skagit River flows are going up in Aug and Sept and wanted to know how that was occurring. Bob answered that Baker and Ross are being evacuated during that period.

STUDY A-09 - BIOLOGICAL STUDIES

Phil presented the results of the 2001 chinook spawning surveys as a PowerPoint presentation and discussed plans for future surveys.

- 2001 chinook surveys covered Baker confluence to Hamilton, 2002 steelhead surveys will cover Baker confluence to Sedro-Woolley, coverage of 2002 salmon surveys will be determined this summer.
- In addition to recording field measurements conducted by boat in 2001, Pete Castle (WDFW) was contacted to identify areas of high spawning concentrations based on Pete's years of aerial observations.
- Stan asked what was used for the redd depth measurement. Phil said survey was done in pit, at the tail spill, and at what would be the depth before redd construction.

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- Don asked whether chinook redds were displaced by redds of other species. Phil noted that the huge run of pinks in 2001 seemed to cause pinks to spawn just about everywhere – and smaller pink redds were observed within larger chinook redds.
 - Gary mentioned that as of mid-April no steelhead have been observed spawning in the upper Skagit, Phil noted that the PSE crews have also not observed steelhead spawning in the middle Skagit River.

REVIEW USFS INSTREAM FLOW STUDY METHOD

Thom showed a PowerPoint presentation of an instream flow approach using aerial photography and soft-copy Photogrammetry. The presentation was the same one given at the last Aquatics Working Group.

- Thom discussed his Acoustic Mapping Techniques, how process works and how results were incorporated into the digital terrain map developed from aerial photography. Cary asked if stable flows were needed for the aerial and bathymetric surveys. Thom said that if flows are unstable they may take the data twice to develop the topography. Velocity measurements are not required to construct the model.
- Phil noted that aerial photogrammetry may be problematic on the Skagit River due to longitudinal changes in turbidity associated with the input of various glacial and non-glacial tributaries
- Cary asked if they compensate for changes in topography associated with sediment transport. Thom said that they do account for bed changes associated with sediment transport, but that accounting for such changes is beyond most instream flow studies.
- Thom noted that the model can be used to predict velocity vectors and magnitude. These predictions are driven by the accuracy of the topography. Cary asked if there was a calculation of error on predicted and actual velocity. Thom said they would go back out and check the accuracy of the topography and my check velocity predictions. Cary asked the difference between calibration and validation. Thom said with calibration, difference from predictions can be fed back into model and changes made.
- Thom thought the model worked very well, as shown by comparing predicted spawning areas and actual chinook redd locations. Phil commented that based on the slides Thom had shown, it appeared the chinook were spawning in the same locations irrespective of the flows. Even doubling the flows, the fish appeared to be spawning in the same areas. Thom noted that some of the downstream areas showed chinook spawning in predicted habitats and not spawning in areas predicted to present unsuitable spawning habitat.
- Thom described the way the model can account for chinook fry habitat by incorporating the availability of escape cover into model predictions.
- Ruth questioned how fish suitability was developed for the model, pointing out how important that step is. Thom responded that suitability was developed from electrofishing and snorkel surveys.

REVIEW OTHER INSTREAM FLOW STUDY ALTERNATIVES & EVALUATION OF INSTREAM FLOW STUDY COMPONENTS

Phil led the discussion referring to an Instream Flow Information Components handout. The objective of the exercise was to evaluate and ultimately identify a preferred method to determine instream flows.

Information Use

- There was confusion regarding the difference between data needed to develop a settlement agreement (column A) compared to data needed to alter default conditions (column B). Phil noted that if the state ramping criteria were used as a licensing condition, much of the typical ramping study would not be needed. If PSE wanted something less restrictive than state criteria, additional and more robust information would be needed.
- Rod pointed out that instream flows often drives the settlement process.
- Steve stated that each agency is going to have to identify how the flow effects each of them and how much information and objections are needed.
- Ruth pointed out it is one thing to study historic alterations in flow, but that does not provide direct information on environmental effects. Phil responded that if state criteria are part of a Settlement Agreement, studies of the effects of ramping, such as the incidence of stranding and trapping of salmonid fry would not be needed. He did note that where the criteria would be monitored would need to be worked out, and an evaluation of a critical flow level would still be needed.
- Don asked if Seattle City Light's project directly affects Baker, even though the Seattle Project is not part of the Baker relicensing, does the FERC have an obligation to consider cumulative effects? Steve and Cary say not necessarily.
- In response to a question regarding how the state criteria were developed, Gary responded that WDFW studied effects of fish on many rivers to determine ramping rates.
- Thom asked for an explanation on how flow levels are now set for the Baker and Skagit projects. In response, Rod mentioned Sue's past presentation regarding the workings of the Baker and Skagit Projects.
- Don asked if there was an ongoing communication between Seattle and PSE regarding flow rates? Cary said there is no formal communications, and no demand from the FERC to do so. From Seattle's position there is nothing to be gained, since they already have their limitations.

Sources of Information

- The group went through the list of possible instream flow approaches and Phil noted that it would be very difficult and costly to build a 2D model for 30 miles of mainstem Skagit River, and the results may not be robust as what would be available on other rivers due to the problems of turbidity and channel complexity below Hamilton. Phil suggested that a 2D model could be done on selected reaches, though selecting a one or two reaches introduces additional error and it would be important to understand between each variability.
- Steve asked if we could use available information to determine which gravel bars have highest potential stranding. Perhaps pick two bars that have the most stranded fry. Which gravel bars are the most critical? Phil says we don't know yet. We can look at existing aerial photos to identify reaches with exposed bars at lower flows but we do not have any biological data to confirm that they are the most sensitive.
- Thom asked if there is a flow routing model for the middle Skagit River? Phil responded that they do not know of a good flow routing model. R2 looked at the FEMA model but it is not

very accurate at the lower range of flows that are of interest during relicensing. So far they have looked at the USGS gage records to give an indication of flow attenuation.

- Thom suggested that given the slow progress the group is making, perhaps a small Technical Teamlet (3-4 people) would be better suited to complete the matrix. The sub-sub group could send out their results for everyone before next meeting.
- Bob wanted to know if this matrix should be considered a way to prioritize studies for relicensing? comparing what would be nice vs. what is needed?

Sediment/Wood

Phil noted that sediment and wood delivery are addressed by existing study plans that are currently underway. The results of the analyses will be incorporated into A-09.

Flow Fluctuation

- Ruth - in the pattern of high flow events, are we looking at history or at appropriate flow patterns for the future, such as the need for high flow events? Stan added that some high flow events are beneficial.
- Phil responded that flood control is a requirement of the existing license and is unlikely to be relaxed under relicensing. The Baker Project controls less than 20% of the Skagit basin area and given the limited reservoir flood storage the Baker Project at best can slightly reduce but not prevent flooding.
- Under i, add, "lateral habitat connectivity. Refer to 5"
- Under j, add "bank stability"

Salmonid Spawning

- Steve and Stan want to know if amplitude of flow fluctuations should be considered, along with ramping. Daily flow can fluctuate dramatically daily.
- Phil asked whether quantifying the relationship between flow and spawning habitat flow is as important as reservoir management? Rod thinks that information is important but not necessarily the standard WUA values; the priority has yet to be decided.
- Thom thinks 3A to 3E will answer 3F.
- Risk assessments of flows are more important than spawning habitats.
- Under j, add "WUA vs. Flow with HSC data"
- Crossing off h

Salmonid Incubation

- Ruth asked if we are looking at incubation timing or flow requirements? Phil explained that the timing of fry emergence is a consideration for flow levels.
- Steve wants C checked because there is no way to tell if spawning levels are enough.
- Phil asked if the Baker Project is responsible for the Baker releases, or is the Baker Project responsible for the effects on Skagit incubation flows?
- Is an incubation mortality study needed? Phil noted that the existing assumption is that if the redds are wet, incubation is protected. Protection of incubating eggs is complicated by issues such as freezing, reduced oxygen transfer affecting embryo development, etc.; but at present they are going with the assumption that keeping water at the surface of redds protects the incubating eggs.
- Add to d, side channel vs. mainstream survival.

Salmonid Rearing

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- Phil asked how important is the rearing habitat vs. flow relationship if the Baker reservoirs are held near full pool from Memorial Day to Labor Day? Daily ramping rates are an issue, but do we need rearing WUA calculations?
 - On “e”, change to rearing habitat vs. flow
 - Add g, “rearing WUA vs. flow”

Downstream Migration

- Phil indicated that they are assuming that higher flows result in faster travel times and higher survival. There are lots of complicating factors, but they will assume higher flow = higher survival unless other evidence suggests otherwise.
- Ruth thinks the group should be able to use the IHA & Chuck Howard model results to develop criteria of flow requirements.

Upstream Migration

- Would we make decisions on low flow hindrances, like for Chum? Possibly.
- Add c, “side/secondary channel connectivity

Water Quality

- Add Water temperature and incubation
- Add b to “low flow thermal hindrances
- Add c, “State H2o quality standards

Biodiversity

- Add c, “riparian vegetation

(add) Little Baker

- Add a, “connectivity”
- Add b, “spatial niche analyses
- Toss Little Baker questions to Tech Teamlet

TECHNICAL TEAMLET:

- Will include Phil, Brad, Hal, Thom, PSE person, and Steve (Steve indicates he does have time but others wanted him kept in the loop)
- Meeting Date
- Task – Flesh out matrix for this group to review

NEW ACTION ITEMS

- IHA analysis split out current Skagit River operations 1981 – 1996 (**Sue**)
- Get meeting notes to people on the phone (**Arnie**)
- Send out updated matrix (work product) from tech Teamlet to participants prior to the next meeting. (**Arnie**)

MEETING HANDOUTS

- Lower Skagit River Instream Flow Study (1999)
- A-24 Hydrology and Geomorphology of the Baker and Lower Skagit River PowerPoint Presentation
- 2001 Chinook Redd Distribution color handout
- Instream Flow Information Components oversized chart
- Aerial Photography and Soft-Copy Photogrametry

EVALUATION OF MEETING

Well-Dones

- Got out early!
- Made good progress
- Creative thinking
- Good meeting preparation
- Excellent facilitator

Opportunities to Improve

- Get POG for Gary
- Get started on time
- Phil should have had the table filled out