Peshastin Creek Tributary and Reach Assessment Comment Response

Comment responses by Gardner Johnston and Randy Goetz, Inter-Fluve, May-June, 2010.

Commentor: Casey Baldwin, WDFW

Comment: The primary missing piece is the lack of an overall strategy that would link the objectives within each reach, ensure appropriate sequencing and cost benefit of high priority actions versus low priority actions.

> **Response:** The reach summaries have been expanded to include a reach-scale strategy that outlines the overall prioritized strategy for restoration in each reach. Project prioritization is the next step and will include a consideration of habitat and stream process objectives as well as cost benefit. Actions will be ranked and identified as higher or lower priority actions. The prioritization strategy will also allow for grouping and sequencing of actions.

Comment: There is risk in trying to do too much treating of the symptoms when you have not fixed the cause of the degradation. With HWY 97 in its current alignment you may not achieve good longevity of these project ideas. There is a lot going on here and I think you would be well served to not get too far down the road on any one project idea until you get feedback from the WHSC, funding sources, permitting agencies, etc.

> **Response:** We acknowledge the deficiencies in approaching restoration from a symptom standpoint as opposed to a cause (and process-based) standpoint. The limitations imposed by Hwy 97 are discussed in depth in numerous locations in the report. In addition, project opportunities for re-alignment of the highway have been added to a couple of the reaches in the Reach Assessment.

Comment: You did not identify in-stream flow as a priority or potential action in Reach 2. Structures for juvenile rearing downstream of the PID don't make much sense when you do not know how much, if any, water will be there at base flow."

> **Response:** The reach summaries have been expanded to include a reach-scale strategy that outlines the overall prioritized strategy for restoration in each reach. Where applicable, in-stream flow has been included in this strategy. It should also be acknowledged that this issue is discussed in several locations in the Tributary and Reach Assessments. A strategy for addressing instream flows needs to be developed in collaboration with the appropriate entities, including the irrigation districts. In most cases, there is not a straightforward "action item" that can be identified at this point that could be evaluated on par with the other potential actions identified in the Reach Assessment. Nevertheless, moving projects forward in the downstream reaches that are affected by

flow diversions will need to consider the effects of flow diversions on project effectiveness.

Comment: Chapter 10 Project Identification and Prioritization, Page 6 "It is important to note that site-specific conditions, such as landowner cooperation, access and infrastructure constraints, often preclude the implementation of the highest priority measures." I agree and think it is good to note possible limitations within the subreach unit due to this; however, I do not think that the Reach Assessment should take options off the table and not include the highest priority actions based on pre-conceived notions about feasibility due to the current circumstances within the subreach.

In some of the individual reach assessment chapters, this reach assessment excludes high priority actions. Please see specific comments I made in Reach 5, as well as Reach 2 subunits (DOZ4, DIZ-2, DIZ5, DOZ9, possibly others) . I don't think you should exclude priorities just because you can't think of a feasible way to treat it in the near-term. In general, I don't disagree with many of your calls regarding near-term feasibility. The problem is that if the writers of reach assessments do not include all degradations in a priority list, start discounting potential projects based on their assumptions about feasibility, then we start to get a biased reach assessment. You need to report all the facts and stay true to the very good prioritization approach that the USBR uses and that you used throughout most of this assessment. At the end of each subreach unit profile you have a section to include the constraints and you can elaborate on your opinion on the current state of those constraints.

Partial solution: In the reach assessment chapters there needs to be an additional section. You go right from a short description to "Habitat Actions". It would help to first list the Priorities, then you can apply some feasibility filters and come up with your near-term action lists.

> **Response:** The reach summaries have been expanded to include a reach-scale strategy that outlines the overall prioritized strategy for restoration in each reach. Nothing in this Reach Assessment should be interpreted to suggest that any potential actions have been taken off the table. The Yakama Nation has emphasized that any potential measures that provide benefit to salmonids will be considered. We look forward to discussions with the WHSC members on this topic, including the potential for including additional actions even though it may be very unlikely they could be implemented in the near future.

Comment: I think you need to double check your data and pool definitions. There is not a biologically meaningful pool in Peshastin Creek until you get to the diversion dam at RM 2.5. Then there are no more than 2 or 3 more until Mill Ck. Your pool frequency data makes Peshastin Creek appear more functional than it is. This is also evident in the % pool by area, which seems way too high. 10-30% pools sounds pretty good, but the reality is that Peshastin Creek desperately needs more pools and habitat diversity. I e-mailed Ed Lyon (USBR) about this. According to Ed "Under the USFS stream survey the pool is measured from the head of

the scour to the tailout (riffle crest). So technically much of what is counted as a "pool" include a long run between the pool scour and riffle. When I map these features on aerial photographs the pool (scour), run, and riffle sequence are separated as "channel units" and not all combined into a pool "habitat unit". This may help explain why the residual depth is only 1-2 ft.

So if you want to be consistent with the USBR reach assessment and use the REI in the same way then you need to redo your pool calculations."

> **Response:** It is acknowledged that pool habitat is scarce and of poor quality in the lower 2 reaches (lower 5 miles) of Peshastin Creek. The USFS Level II protocol was used for the habitat assessments. Our understanding was that the other reach assessments also used this protocol and that there was a desire to remain consistent with these other efforts (and future potential efforts). No threshold residual depth is given in the protocol for when to consider a unit a pool, but instead it simply states that there must be residual depth. We chose, however, to use a threshold depth criteria of 0.5 feet. The REI uses pool frequency (i.e. pools/mile) as the indicator, but perhaps percent pool area would be a more appropriate metric especially because many of the pools barely meet the length threshold (pools must have length at least as long as the wetted width) and so whereas there may be decent pools/mi, there is an overall low abundance of pool habitat. State standards indicate that pool habitat is "poor" if pools make up less than 35-40% of the surface area. Reaches 1 and 2 have less than 20% pool habitat, and none of the reaches exceed 35%.

Commentor: David Morgan, USFWS

Comment: Add mile markers on all maps (ex: rm 0.1, 0.2, etc) so that flipping between text and maps is easier.

> **Response:** In subsequent drafts of the RA, all maps will be formatted with RM designations.

Comment: Provide estimates of lengths and acres of side channel, and floodplain access / protection opportunities, approx volume of fill needed for removal (crude est are OK at this point).

> **Response**: We'll work to include metrics where feasible and appropriate. In many cases, estimates are difficult to make at the project identification stage.

Comment: Would like rough estimate and description of a big-picture, reroute Hwy 97 option to Campbell Cr Rd. This would help facilitate the "chronic deficiency" discussions with WSDOT. Maybe reroute is a silly dream, but the RA would be even more useful if it could contribute here.

For example, is it really only the one spot we already know about where if we thought big we'd consider rerouting the stream to where it used to be (ie- near recent hwy washout)?

> **Response**: We have included a project that includes potential re-route of Hwy 97 in this area.

Comment: Add the inundation maps to the RA (they're in TA now, but fewer people are likely to read it, and it'd visually depict what you might gain if you did some projects described in RA).

> **Response**: Good point. Inundation levels definitely apply to project identification. However, there is a lot of information already in the RA and there is a desire to keep the RA focused and as clearly presented as possible. Although we may not add all the maps into the RA, we'll work to incorporate the results of the inundation analysis into the reach write-ups.

Comment: There is a significant area of bank erosion just upstream of the RA analysis area; we ought to at least include this long cut bank in the RA.

> **Response**: The RA has been extended to the mouth of Ingalls Creek in subsequent drafts. This extension includes identification and descriptions of projects in this reach.

Comment: At the end of the RA I was confused how "reconnect stream process" and "off channel and floodplain reconnection process" were distinguishable from each other.

> **Response**: The introduction to the reach assessment describes these categories. We have revised the examples in order to clarify the difference between these categories.

Comment: It'd be great to include a crude est of how many potential projects appear at this time to be realistic and doable, versus theoretically possible; can they point out the top 5 leaders in 2 categories: process and structure?

> **Response**: Project prioritization is the next step and will include a consideration of habitat and stream process objectives as well as cost benefit. Actions will be ranked and identified as higher or lower priority actions. The prioritization strategy will also allow for grouping and sequencing of actions. This strategy will be discussed at the next WHSC meeting.

Comment: I'm glad to see some info (in TA) about ISF, a huge limiting factor here, and other studies. I hope this is jump starts dialog with the ISF committee, because some of the ideas for improving ISF in Peshastin described in the other reports, and now pasted into the TA, are not viable (spilling Icicle canal water into Peshastin; probably also the reservoir idea), but others might be strong candidates for getting fish $ to implement (pumping from the Wenatchee).

Response: Agreed. In-stream flow is a significant limiting factor in the downstream reaches of Peshastin Creek (below the PID and Tandy Ditch diversions) and a strategy for tackling this issue should be developed with the ISF.

Commentor: Mike Kane, Chelan Co. DNR.

Comment (paraphrased): What is the reason for stopping the RA at RM 8.4? There are potential projects upstream to the mouth of Ingalls Creek that should be included in the RA.

Response: The RA has been extended up to the mouth of Ingalls Creek.

Commentor: Lucy Piety and Jennifer Bountry, BOR commenting on the TA only

Comment: Background hydrology reference, which is discussed in Chapter 6 and listed in Table 1 of each of the 5 reach assessment chapters (13 through 17), is listed as BOR (2008). According to the reference list (Chapter 19), this is the Nason Creek Tributary Assessment. There is a report of USGS gage analysis by David Sutley (2007) for the Wenatchee drainage basin, which would seem to be more applicable to the Peshastin drainage.

Response: Appendix D of the Nason Tributary Assessment (BOR 2008) appears to be the same as the Sutley (2007) assessment you mention. This assessment included flood peak estimates at the sub-basin scale for the entire Wenatchee Basin including Nason Creek and Peshastin Creek. This GIS was the source for information provided in Table 1 of each reach summary and referenced as the Nason Creek Tributary Assessment. It seems like the appropriate citation is BOR (2008). Please let us know if this needs clarification or if there is a better citation.

Comment: Modeling methods, chapter 7 - it would be useful to note the river flow at the time of LiDAR data collection and the % of 2-year and 100-year flood values (assume it will show it is a minimal value).

Response: Agreed. The information will be obtained and included in subsequent drafts of the TA.

Comment: Existing conditions floodplain mapping in modeling chapter 7 – it may be useful to plot levees on inundation map that were imposed in the model along with the natural floodplain boundary to show reduction in floodplain access in existing conditions.

Response: Agreed. Subsequent drafts of the TA will include modeled human features on floodplain inundation maps.

Comment: It would be interesting to note the magnitude of historical channel incision that has occurred and where, or what information and analysis would be needed to determine this. It would be interesting to correlate this to proposed projects to determine the potential for reconnection opportunities.

> **Response**: Agreed. This information would be a valuable addition to the TA/RA and would help inform project location and design. Very little historical information, such as stream bed elevations, exists. Most information on aggradation or incision is based on field observations of current conditions; these observations are included where applicable.

Commentor: Ed Lyons, BOR

Comment: Consider changing the title to the following (or something similar with geographic references): *Preston Creek Tributary and Reach Assessments, Wenatchee Subbasin, Chelan County, Washington*.

> **Response**: We'll ensure the Wenatchee Subbasin and county are included on the title page in subsequent drafts.

Comment: In the report, General Regional Characteristics, Drainage Basin Characteristics, Valley Segment Characteristics, and Channel Segment Characteristics could be incorporated (this request has been made by Casey Baldwin, UCRTT Chairperson, on other tributary/reach assessments; and my preference is to include a table format prior to the REI condition evaluation table). These items are also requested in the *Monitoring Strategy* (Hillman 2006), and by USFWS and NMFS to be included in *Biological Assessments* for project permitting (Skidmore et al. 2009). You have many of these characteristics identified throughout the report. A GIS source of information I recommend you acquire and use is *Morrison, P.H. and Smith IV, H.M., 2007, Ecological classifications of the Upper Columbia evolutionary significant unit for spring Chinook salmon and summer steelhead trout: Pacific Biodiversity Institute, Winthrop, WA.* They have constructed a geodatabase for the Upper Columbia Regional Technical Team to evaluate most of these characteristics and in some subbasins they also have road densities at the HUC 6 scale. If you cannot get a copy of the geodatabase from PBI, then please contact Kristin Swoboda (kswoboda@usbr.gov) for the shapefiles.

Regional Characteristics include: Bailey Classification, Omernik Classification, Physiography, Geology

Drainage Basin Characteristics include: Basin Area, Basin Relief, Drainage Density, Hydrologic Unit Code, Strahler Stream Order, Stream Classification, Landownership

Valley Segment Characteristics include: Subwatershed Acreage, Valley Bottom Type, Valley Bottom Width, Valley Bottom Gradient, Valley Confinement, and Channel Patterns

Channel Segment Characteristics include: Valley Type, Elevation, Channel Type, Bed-form, Channel Gradient, and Sinuosity

> **Response**: We agree that this is all pertinent and valuable information that should be included where possible. We will attempt to obtain this information an incorporate it into subsequent drafts where time and resources allow.

Comment: The geomorphic reaches could have been further refined. If I remember correctly, BOR placed many of the reach breaks at the apex of alluvial fans and/or bedrock outcrops. Some of these confined reaches could have been further separated as additional geomorphic reaches (it appears that these have been addressed as subreaches, which is also appropriate).

> **Response**: In our designation of geomorphic reach and sub-reaches, we followed previous BOR designations. Additional resolution was gained by identifying and describing sub-units that include specific floodplain or active channel areas.

Comment: CH 1: 4 Description of Study Area. Peshastin Creek is technically part of the larger Ingalls Creek subwatershed (HUC 1702001105) (Morrison and Smith 2007).

> **Response**: This information will be included in subsequent drafts.

Comment: CH 3: 3.2 Glacial History. Consider including a brief discussion on the Ingalls Creek glacier and its impact on the valley type within the Ingalls Creek drainage and within the Peshastin Creek valley. There has been local discussion on reconnecting a channel at about RM 7 river right. This channel is interpreted to be a coulee formed by outwash flows from the Ingalls Creek glacier during the Leavenworth or younger glacial advance and is elevated above the current creek channel.

> **Response**: We will seek out references for the history of the Ingalls glacier and will work to include that in the overview of the glacial history of the basin. Re-connecting the Coulee is not identified as a project in this study.

Comment: CH 7: 9.1 Channel Morphology. “These locally steep sections occur in both confined and unconfined valley reaches.” Are any of the sections artificially confined within the unconfined valley reaches? If so, this may imply localized incision and a significant change in sediment transport capacity.

> **Response**: Yes, some of these sections are artificially confined. A discussion of the implications of artificial channel confinement on channel processes will be expanded in subsequent drafts.

Comment: CH 7: 9.7 Fish Passage Barriers. Reach 1 – the alluvial fan deposit basically dewaters during late summer causing a fish passage barrier. This is an extremely important point that needs to be thoroughly discussed. Why does it dewater (i.e. fan depth, channel incision, channel confinement, irrigation diversions, riparian vegetation etc). The point is if this fan is a fish barrier, then it needs to be addressed prior to implementing any upstream habitat actions (i.e. reconnect isolated habitat), except those actions pertaining to water quality and LWD recruitment potential.

Reach 2 – the diversion dam. Has this dam been evaluated for upstream juvenile migration at all biological flows? In the photo, it appears that it could be a partial barrier (velocity) during high flows?

> **Response**: We agree that these are important issues that deserve expanded discussion. We will increase our discussion of the dewatering of the lower reaches. We will also seek clarification on the passability of the diversion dam from WHSC members.

Comment: CH 10: 10.2 Habitat Restoration and Preservation Framework. Consider adapting the Roni strategy to Skidmore's

(1) Protect and Maintain current function

(2) Reconnect Isolated Habitat (i.e. subwatersheds and off-channel habitat) which should be a priority over processes and enhancement. Here again, if the fish cannot access the habitat then there is no reason to be spending money on habitat actions upstream except to improve water quality and large wood recruitment potential.

(3) Reconnect Processes (stream channel and floodplain)

(4) Riparian Rehabilitation

(5) Reconnect Isolated Habitat Units (i.e. instream habitat enhancement). Note: the UCRTT wants to see these type of projects developed at the reach-scale.

> **Response**: The categories used in the RA reflect the process-based strategies put forth by many different researchers and practitioners; and have been customized to fit the specific conditions and purposes of project identification and prioritization in the study area. The categories were chosen to distinguish between process-based strategies and more short-term habitat-based strategies. There are few fish passage enhancement projects in mainstem Peshastin Creek; and these were incorporated into the "reconnect stream channel processes" category. It may be worth keeping these as a separate category.

Comment: Inner zone and outer zone subreaches should be identified as continuous tracts of active channel and side channels (including disconnected side channels) for the inner zones, and continuous tracts of floodplain (laterally and longitudinally, including disconnected floodplain)

that are truncated by the river at the upstream and downstream ends and bounded by geologic features (i.e. glacial terrace, bedrock).

These subreaches can then be further refined as parcels (this report refers to them as sub-units which may be confusing to some readers as subreaches). The parcels are essentially your project areas. I had to incorporate this hierarchical relationship in the Middle Methow reach assessment where anthropogenic impacts are much more complex. Each parcel presents its own problems with connectivity, feasibility, and other constraints, and habitat actions can be implemented on some parcels independently while others have to be combined (i.e. habitat actions need to be implemented on parcel X before actions are implemented on parcel Y).

Example of the hierarchical relationship:

RM X to Z (length of inner zone subreach and adjacent outer zone subreaches) – description of the channel and floodplain interactions along the length of the inner zone. Is the channel a transport segment, transition (actively adjusting), or deposition (response)? What I have found in the past are that some channel segments prior to anthropogenic disturbances would have been in a depositional regime, but do to riprap, levees, etc. are now in transition (actively adjusting to the impacts; i.e. localized incision).

Subreach IZ-1 (include a table of metrics; i.e. acres, channel units, riparian buffer zone etc.

Subreach Complex OZ-1 (include table of metrics; i.e acres etc.; and list of parcels)

Parcels OZ-1a, DOZ-1b, and OZ-1c (include table of metrics; i.e. acres, length of features, vegetation condition etc.)

For purposes of monitoring interventions (habitat actions), metrics need to be tabulated for each subreach and/or parcel so that a time series of the physical changes and biological response can be monitored overtime (intervention analysis; BACI).

Response: In the majority of cases, the sub-unit boundary covers the entire geomorphic feature, however, in areas where anthropogenic impacts varied significantly in different portions of the unit, we designated a separate unit. This allowed more flexibility to discuss restoration strategies at this scale. Sub-unit scale metrics will be calculated as time and resources allow and with consideration of how these data support project identification.