ADF&G Comments - Draft Eklutna Study Plans

Response due to Samantha Owen November 25, 2020

Chapter	Study	Page	Section	Text	Comment	Author
2.0 Project Facilities and Operations	N/A	22 (Paragraph 3)	2.2.1	Lake level is drawn below the natural glacial moraine for about 9 months per year	Without major modification to project operation this, we believe, indicates that the only feasible timeframe to supply flows to the river (without construction of a conveyance pipe or decreasing the dam invert) would essentially be August-October. And in low water years maybe not at all. Project constraints such as this should be more thoroughly considered prior to development of IFS study components....knowledge of project constraints could inform the parameters of various projects.	ADF&G
2.0 Project Facilities and Operations	N/A	22 (Paragraph 5)	2.2.1	The 30 by 30 drainage outlet in the base of the spillway crest is controlled by a manually operated slide gate conduit and can release up to 191 CFS.....	Under current conditions the only avenue for a controlled water release into the river is through this drainage gate and the max discharge capacity (if reservoir is at the spillway crest [only a couple months a year]) is only 191 CFS max (and usually much less)). The only other avenue of release is if the spillway overtops which would be an uncontrolled release by definition. with these operational constraints what is the avenue for providing controlled releases sufficient to flush the channel and/or calibrate the models?	ADF&G
2.0 Project Facilities and Operations	N/A	27	Table 2-2	Table 2-2	Since construction of the upper dam there has been one spill flow of 1,000CFS (1995), but that was a very brief duration....the average flow during that event was 426 cfs for 30 days. The next highest spill event (1997) had an average flow of 242 cfs over 74 days. How will sufficient controlled releases to restructure the channel and calibrate models occur? What is the plan for supplying whatever flows are determined through modeling to be appropriate since whatever they are will be far in excess of anything that can be allocated under current project conditions. Suggest determining the operational sideboards prior to completing idealistic modeling exercise.	ADF&G
3.0 Study Plans	Instream Flow Study	General Comment about the IFS and modeling (HEC-RAS and PHABSIM) exercises			If a realistically achievable flow scenario, given project operational constraints, would result in a fairly flat sustained discharge of say 50 CFS with maybe a 30-day pulse of ~100 cfs during the fall, would a full-blown IFS/Modeling exercise even be justified? It seems that a full-blown IFS study would really only be justified if a realistic flow regime included discharge levels that would restructure significantly the existing channel and engage long abandoned lateral habitats...otherwise, it seems more reasonable to use a simple adaptive management process where controlled flows are selected, released, and resulting conditions observed. Once the range of feasible flow releases are assessed, experts and managers would, in collaboration with the utilities, prescribe a desired (and feasible) flow regime. Suggest considering implementing a Delphi-based methodology (*Arnold et al. 1997; USFS, 2007*) in which a panel of experts (including fish biologists and hydrologists with technical and local knowlege) assess actual discharge rates and reach a consensus of prefered hydrograph characteristics taking into account what is reasonably achievable given project sideboards. This would be a multi-year adaptive model that would idealy occur following study 3.9 (Hydro Operations Modeling Study) Which would inform sideboards.	ADF&G

3.0 Study Plans	Instream Flow Study	29 (Paragraph 3)	3.1.1	From 1929 through 1955 there were controlled releases of flow from the lake downstream but were not designed for fish habitat….it is likely that resident fish populations were maintained to some level during this period….	This seems to suggest that following controlled releases of flow in 1955 that resident fish populations were expected to die back. This does not appear to be the case; in fact there are intact, stable aquatic habitats upstream from the removed dam that support a fairly prolific year-round population of large stream-resident Dolly Varden. Under current conditions we are already seeing a recolonization of these habitats by juvenile and adult (likely spawning) salmon....and this trend will continue even without additional flow allocation. These existing conditions should be considered during IFS project design; do we want to risk impacting these habitats to calibrate a model that may not be reliable and having the resulting flow recommendations be unachievable?	ADF&G
3.0 Study Plans	Instream Flow Study	30 (paragraph 3)	3.1.1	Conventional instream flow studies that are focused on fish habitat generally make an assumption that the existing channel bed morphology is and will remain stable, thereby the longevity and applicability of instream flow prescriptions mad under field measured conditions is generally accepted. This is clearly not the case for the Eklutna River....This study explicitly recognizes this and is designed to be completed in 3 phases: 1. Defining initial conditions... 2. Estimating future conditions based on alternative flow regimes and feasible operational scenarios. 3. Monitoring and adaptively managing selected flow regime.	IFS's generally assume that existing channel geomorphology is relatively stable in order to have confidence in model results. This is not the case here and we strongly suspect that model predictions will not be accurate unless the channel is reformed with a flushing flow first. Recommend considering alternatives to development of a full ISF study. One alternative that could be considered is start with #3 and release controlled volume of flow at 25, 75 ,150 CFS for extended periods of time and simply observe conditions and assess habitat conditions. These observations could be used to adaptively manage the system for desired flow, duration, timing, etc. (essentially Delphi methodology) Concurrently, the Utilities could proceed with study 3.9 Hydro Operations Modeling to develop some realistic project sideboards for flow, duration and timing. Given modeling limitations and currently undefined operational sideboards why expend the time and money to model scenarios that wont be practically achieved.	ADF&G
3.0 Study Plans	Instream Flow Study	31 (Paragraph 1)	3.1.1.1	TU and NVE convened a workshop to discuss instream flow and developed a vision for salmon recovery in the Eklutna River. As noted in the IIP, participants concluded that establishing and maintaining adequate streamflow was the most important consideration for restoring salmon runs to the Eklutna River.	This is true, but the workshop only discussed the issue from an idealistic perspective. There was very limited discussion associated with the realistic sideboards of the project and what could be reasonably achieved under a realistic scenario and what the resultant improvements to aquatic habitats and salmon abundance would look like.	ADF&G
3.0 Study Plans	Instream Flow Study	32	3.1.2	Bullet 2: Utilize relationships for determining habitats under varying operational flow release scenarios.	If modeling is indeed done, recommend limiting this analysis to those flows that are realistically achievable rather than through an idealistic view of returning the river to its historic state…the proposed calibration flows of 25, 75, and 150 cfs seem reasonable and will account for the full range of possible flow scenarios from the project and will not result in damaging existing productive habitats.	ADF&G
3.0 Study Plans	Instream Flow Study	33	3.1.2	all Objectives	It seems like it will be unlikely to achieve any of the Objectives without first allocating a flushing flow to redefine the channel to improve model calibration. But we are not supportive of allocating a large flushing flow down the system and damaging 5 miles of existing productive habitats just to calibrate models that will predict (likely inaccurately) what stream and fish habitat conditions might look like under a range of flow scenarios that are not achievable in the first place due to project operational constraints.	ADF&G
3.0 Study Plans	Instream Flow Study	44 (last bullet)	3.1.4.5	Bed Elevations measure to the nearest .5 ft.	0.5 ft does not seem precise enough in a stream that in many places isn't even 0.5 feet deep. 0 .1 ft accuracy is recommended.	ADF&G

3.0 Study Plans	Instream Flow Study	45 (first bullet)	3.1.4.5	Bank Profile (to the nearest 0.1 ft) - Survey of channel area extending from water's edge to approximately the ordinary high water mark.	Ordinary High water is nothing more than a legal term for the approximate point on the bank of a waterbody that's created by roughly a 1.5 year return interval. Conversely, Bankfull is a geomorphically delineated (and defined) point on the river bank that represents the transition point between the channel and the floodplain. Suggest using BF rather than OHW	ADF&G
3.0 Study Plans	Instream Flow Study	45 (second bullet)	3.1.4.5	Water Depth measured to nearest 0.5. ft.	This is not precise enough….0.1 ft. accuracy should be easily achievable.	ADF&G
3.0 Study Plans	Instream Flow Study	48 (last paragraph)	3.1.4.5	The proposed release of target flows to the Eklutna River….as part of the IFS will likely cause some changes in channel morphology….These will be occurring in the short term during field measurements and to some extent will be integrated into the development of the current conditions modeling. Subsequent releases of higher flushing flows and or agree-to sustained flow releases will likely result in both near-term (1-10 years) and long-term (10-20 years) changes…In this case, the fish habitat results derived from current channel morphology will change as a result of changes to channel morphology.	Our interpertation of these statements is that the projections developed for fish habitat from these modeling exercises will become moot as soon as the inevitable geomorphic changes occur following increased flow allocation. If that is the case, what are we gaining by conducting these modeling efforts if the model predictions are not relevant once the channel adjusts to the new flow regime?	ADF&G
3.0 Study Plans	Eklutna River Fish Composition and Distribution	64 (Paragraph 1)	3.3.1.2	Dolly Varden have been documented in the Eklutna River in relatively low numbers….	This may be true in the lower reaches, but in the reaches upstream from the Thunder Bird Confluence and especially above the sediment wedge, Dolly Varden are very abundant with what appears to be a healthy size structure with many large (200 mm) adults present and lots of small juveniles.	ADF&G
3.0 Study Plans	Eklutna River Fish Composition and Distribution	66 (Paragraph 3)	3.3.3	The study area for the Adult Salmon survey task includes an approximately 4 mile reach…starting just upstream of he beaver complex to a bit below the removed dam.	We believe that we are going to see adults begin to move into the habitats upstream from the sediment wedge as they are the best spawning and rearing habitats in the entire system. Suggest extending adult surveys upstream much further.	ADF&G
3.0 Study Plans	Macroinvertebrate Study	78 (Paragraph 1)	3.4.4	A composite of 8-10 benthic sampling areas will be collected from riffle habitats at each study site using D-Frame kick net.	What about drifting aquatics and riparian terrestrial? It seems like if the goal is to, "characterize the current macroinvertebrate community along the longitudinal profile of the Eklutna River…." then we would want to include the full suite of invertebrates that use these habitats and support the fish populations. Stomach content analysis of fish would also be interesting although this would probably more appropriately fit under the fish study.	ADF&G
3.0 Study Plans	Lake Aquatic Habitat and Fish st	93	3.7.1.3	Traditional knowledge from members of the Native Village of Eklutna have suggested that historically there was a sockeye salmon run into Eklutna Lake. A recent study used radio isotopes of lake sediment to search for evidence of this run, but couldn't draw definite conclusions.	There is no reason to doubt that this lake used to support anadromous salmon. F&G did not stock Kokanee here, and sockeye salmon commonly revert to Kokanee salmon in lakes where access is intermittent…this occurs commonly across Alaska and is the only reasonable explanation for the presence of self sustaining Kokanee population. The essential question is where are these fish spawning and are conditions currently available to support returning anadromous salmon if that becomes a reality in the future.	ADF&G
3.0 Study Plans	Lake Aquatic Habitat and Fish st	103	3.7.4.2	Fish sampling to take place in July and August.	One very interesting aspect of this study is attempting to identify the locations used by spawning Kokanee salmon and to a lesser extent Dolly Varden. In both cases, a fish sampling window of July and August is probably a bit early. Suggest September and October sampling as well. ADF&G has observed pre-spawn Dolly Varden in full spawning colors in late October in Southcentral Alaska.	ADF&G
3.0 Study Plans	Hydro Operations Modeling Stu	General Comment about this study			Ideally, this study should be completed first to inform breadth of proposed IFS studies or alternative scenario. The IFS is time and labor intensive and modeling hydro and habitat scenarios for a range of flows that may not be realistically achievable seems unproductive.	ADF&G

Arnold, S.H., D.W. Culligan, J. Homa, and J.L. Sabattis. 1997. Collaborative instream flow resolution utilizing an enhanced Delphi technique. In Proceedings of the International Conference on Hydropower, Volume 1, pp 500-509. D.J. Mahoney Editor. ASCE, New York, New York.

USFS 2007. Instream Flows Below Cascade Creek Diversion Dam and in Little Cascade Creek. Tacoma Hydroelectric Project FERC No. 12589. Colorado Division of Wildlife; and Devine Tarbell & Associates, Inc. December 9, 2007.