



# SUSITNA-WATANA HYDRO

## Meeting Notes Fish Passage Technical Team Fish Passage Workshop #2 - Brainstorm September 9-11, 2014

**LOCATION:** 2353 130th Avenue N.E.  
Suite 200  
520 Corporate Center  
Bellevue, WA 98005

**TIME:** 9/9 Meeting: 7:30 am – 4:30 pm (AKDT), 8:30 am – 5:30 pm (PDT)  
9/10 Meeting: 7:30 am – 4:30 pm (AKDT), 8:30 am – 5:30 pm (PDT)  
9/11 Meeting: 7:30 am – 1:30 pm (AKDT), 8:30 am – 2:30 pm (PDT)

**SUBJECT:** Fish Passage Brainstorm Workshop (Workshop #2)

**GOALS:** Meeting goals include:

- Review of project and biological information updates relevant to the Fish Passage Technical Team (FPTT) brainstorm session
- Conceptual alternatives brainstorming
- Initial concept development
- Review of evaluation process and discussion of preliminary evaluation criteria
- Review of revised study schedule and next steps

**PARTICIPANTS:** *Fish Passage Technical Team Attendees:* Betsy McGregor AEA, Doug Ott AEA, Ron Benkert ADF&G, Chick Sweeney Alden Labs, Al Giorgi BioAnalysts, Inc., Dana Schmidt Golder, George Gilmour Meridian, Clint Smith MWH, Ed Meyer NMFS, Sue Walker NMFS, Ed Zapel NHC, Graham Hill NHC, Dana Postlewait R2, MaryLou Keefe R2, Tim Sullivan R2, Dan Turner R2, Betsy McCracken USFWS

*Other Attendees:* Dara Glass CIRI (via phone), John Haapala MWH (to present hydrology data), Kai Steimle R2, Matt Love VNF (via phone)

Three days of meetings were held from September 9 through September 11, 2014 at MWH's office in Bellevue, WA. These meeting notes are intended to give a brief overview of discussions, review the status of prior action items, and identify new action items. Active action items from this meeting, as well as those not completed from previous meetings, are provided in a table at the end of this document. Completed action items and "parking lot items" are included in separate tables following these meeting notes.

Materials for this workshop were posted on the Susitna-Watana Hydroelectric Project website at: <http://www.susitna-watanahydro.org/meetings/>. Posted materials included:

- Draft Agenda
- Information Needs, Location, and Status Summary, Rev 6
- Information Item B12: Summary of Biological Information
- Handout: Summary of Biological Information
- Physical, Hydrologic & Engineering Information (Information Items P3 – P5), Operating Scenarios OS-1b and ILF-1, Sept 9-11, 2014 by MWH
- Stream Flow Assessment, 2012 Study Report, February 2013 by Tetra Tech, Inc. This provides information related to the run-of-river operations
- Stream Flow Assessment Appendix A-K, 2012 Study Report, February 2013 by Tetra Tech, Inc.

Information handed out at the meeting included:

- Handout: Summary of Biological Information, September 9-11, 2014
- Handout: Relevant Study Data Location Maps, September 9-11, 2014
- Handout: Upper Reservoir Tributary Mapping Examples, September 9-11, 2014
- Wind Data for Information Item P11. This includes raw wind data from the SuWa MET station, and is provided in response for Information Item P11 (note that this is from the public SuWa website, and is repeated here for convenience)
- CEII Drawings of the dam plan and three cross sections to inform the team of the project design. These are not posted to the SuWa website per CEII conditions.
- CEII Drawings, 2 cross sections provided from just downstream of the dam site. These are not posted to the SuWa website per CEII conditions.

### **September 9, 2014**

After introductions, Dana Postlewait began the meeting by presenting the agenda.

#### **Introduction**

The purpose of the workshop is to brainstorm collaboratively in open process so that all parties understand issues, uncertainties, and risks. As described in the Study Plan, the overall goal is to develop passage options and document the process. The passage strategies in the Study Plan include: 1) the proposed Project without passage, 2) integrated upstream and downstream fish passage features into the current Project design, and 3) retrofit of upstream and downstream fish passage features into Project designed without passage. The study results will be feasible passage strategies that can be integrated into other decision processes. This study will not evaluate whether passage is to be provided; however, it will support that evaluation with data and identify technically feasible passage facilities.

The first step of the workshop will be to review the physical features of the Project, biological information, and operational information. The second step will be to use an iterative approach to brainstorm a full breadth of ideas and then start to organize components into systems. Elements of the brainstorming should include collection and transport for upstream and downstream passage. This will be the first time the group discusses fish passage ideas, as the work completed on the fish passage study to date has primarily focused on creating the fish passage technical team (FPTT), developing an information needs list, organizing data available to address this list, reviewing preliminary project information, and completing the site visit. The goal of this workshop is to identify concepts for later evaluation, and a revised schedule will be developed for the duration of the study following the workshop.

Dana Postlewait noted that all of the information provided to the FPTT through June 2014 was summarized in the ISR, which provides a good organized reference for future work. Looking ahead, the schedule is tight but manageable for the next year.

The Services' consultant, Ed Zapel of NHC indicated that it is important to identify biological goals for fish passage. The study lead responded that management goals for the future reservoir are not clear at this time. The FPTT will need to use assumptions to develop feasible passage facilities that can address a range of management objectives. The goal is to have a suite of systems to evaluate in the next steps.

The issues of ice timing was brought up as an information need. NMFS suggested a parking lot for ice related issues. AEA provided an update on coordinated studies. The ice study is ongoing: data collection is largely complete, but the modeling is ongoing. The team identified the timing of tributary freeze up and thaw as an information need. AEA was identified as the source of updates on relevant information from the ice study.

### **Previous Meeting Notes and Action Item Review**

On September 1, 2014, the September 18-19, 2013 meeting notes were distributed via email for attendees' review. Dana Postlewait asked if any attendees had outstanding comments on these notes, commented that it has been some time since that meeting, and asked if more time would be helpful to review. The group responded that they would like more time to review the notes, so the notes will be reviewed for finalization at the next meeting. Dana P. added that the action item list would be updated with this set of meeting notes, so the previous notes action item lists could be disregarded.

### **Biological Information Review**

Tim Sullivan summarized biological background information previously provided in Appendices B1-B11 from the ISR and B12, which included newly compiled information. After a review of the ISR content, NMFS pointed out that it does not include anecdotal observations of sockeye in Tsi Lake and at the mouth of the Oshetna River in the Upper River. ADF&G indicated that the anecdotal observations were visual observations from 20 years ago that were not documented or confirmed by any subsequent sampling. NMFS requested that anecdotal observations of sockeye in the Upper River be included in future reports.

AEA's consultants indicated that the target species included in Appendix B12 are intended to be representative with respect to type of swimming, spawning timing, etc. AEA wants to consider Chinook salmon representative of all Pacific salmon species. Specific species may be more important to evaluation than to the brainstorming workshop.

Dana Schmidt asked if capacity requirements have been identified for passage facilities (such as the number of fish expected in a trap in one day). R2 pointed out that peak daily run estimates were provided in B12, but capacity issues would be more important for evaluation of concepts than for brainstorming.

R2 presented the ISR content with respect to downstream migrant trapping as well as an update with preliminary 2014 catches. A second August pulse of Chinook salmon outmigrants was observed in 2013, AEA will be looking for that again in 2014.

Appendix B12 focused on Chinook salmon, Arctic grayling, burbot and round whitefish. These four species span the range of swimming abilities and spawning timing, and should be representative of all the species that could be encountered in any fish passage facilities. R2 presented the 2013 radio telemetry results from the ISR.

### **Chinook Salmon**

The ISR map of juvenile Chinook salmon distribution was presented along with the results of aerial surveys and radio telemetry tracking of adult Chinook salmon. In 2013, Chinook salmon apparent exploratory behavior was observed above the dam site. In 2014, one adult Chinook salmon was assigned to Kosina Creek despite exploratory behavior.

### **Grayling**

The ISR results from 2013 sampling were presented including distribution maps and radio telemetry results from late summer 2013. Downstream movement past the dam site was observed in multiple individuals. In 2014, some radio-tagged Arctic grayling tagged in the Oshetna River appeared to be overwintering in the Tyone River. PIT tag data was also presented. R2 confirmed that PIT detections represent a spatial subsample as antennas did not span the full channel.

### **Round Whitefish**

The ISR results from 2013 sampling were presented including distribution maps. Round whitefish were more common in the mainstem Susitna River from summer into fall 2013. No radio telemetry data was available for the ISR. In 2013, one humpback whitefish PIT-tagged in the Oshetna River moved downstream through Devils Canyon into Middle River FA-104 (Whiskers Slough).

### **Burbot**

The ISR results from 2013 sampling were presented including distribution maps.

### **Discussion**

Discussion of the biological background information continued. R2 confirmed that the timing of downstream movement in May was a function of sampling timing as traps were installed after ice

breakup. The services' consultant asked whether redd surveys had been conducted for Chinook salmon. R2 confirmed that redd surveys were not conducted but that aerial surveys were completed every 5 days from the first week of July through August 15. The team inquired about any evidence of habitat partitioning among species. R2 indicated that there was some evidence of Dolly Varden using smaller tributaries. ADF&G asked about observations of lake trout. R2 indicated that 2014 sampling had documented more lake trout in the Upper River than were observed in 2013. R2 shared that overwintering Arctic grayling showed spatially distinct movement patterns. From the Oshetna River, Arctic grayling tended to head upstream to overwinter. From Kosina Creek, overwintering Arctic grayling used downstream tributaries, moving downstream of the dam site but staying above Devils Canyon. It was noted that these observations are representative of larger, taggable fish.

R2 presented sonar data from the dam site for Chinook salmon and residents during the period of Chinook migration. The daily peak count for Chinook salmon was 3 individuals on August 1, 2014. The daily peak for resident species, defined as fishes less than 50 cm, was 55 fish on July 9, 2014.

The USFWS asked if radio tagged fish were tracked above Oshetna and R2 confirmed that they are. The FPTT discussed why the upper extent of the study area for the Upper River Fish Distribution and Abundance Study was limited to the Oshetna. The response was that the study area was limited to the area of project effects. There was disagreement over the extent to which project effects extended upstream of the proposed reservoir. The question was raised as to whether the Biological Performance Tool (BPT) for the Fish Passage Study would analyze effects on productivity. R2 confirmed that it will not and indicated that effects on productivity are outside the scope of this study and technical team.

R2 presented Appendix B12. The biological information was organized into a three-part conceptual model for fish information

- 1) Existing conditions: run timing, spawning, rearing habitats, outmigration timing
- 2) Impacts of project: flow timing, habitat (temp & flow), downstream migration, habitat impacts
- 3) Summary tables to be used as a reference, revised based on site visit comments.

Action item: identify rainbow trout stocking in Upper River.

Action Item: distinguish distribution above Devils Canyon / below Devils Canyon in the Middle River in summary tables.

### **Project Features**

Clint Smith presented a video fly-through of MWH's 3-D facility design model showing the current status of the Project features, and also presented CEII design drawings of the dam. The video presented a more recent design status than the drawings, which are still in flux due to the ongoing design effort. Two sets of drawings were reviewed; the first was the same set reviewed in September 2013 and which addresses Information Item #P16 on Rev 5 of the Information List document. An additional set of drawings with elevation contours and cross-sections were presented based on the request from the last meeting. NMFS asked about the availability of cross-sections further downstream. AEA confirmed that

LIDAR from 2014 will supersede the Mat-Su LIDAR and provide elevation data. Also, the flow-routing study has at least one transect per mile in the tailrace of the dam. Additional data sources include tributary gages on Fog Creek, Tsusena Creek, Kosina Creek, and the Oshetna River.

The state of the current Project design was described as preliminary and for the purposes of the brainstorm; some alterations to the location of features like intake structures could be considered in the workshop but the concepts should be developed based on the current documents.

The team was reminded that the meeting materials were available on the public website under the "Meetings" header. The email list would be used to distribute meeting minutes and action items. An action item is to redistribute the information previously posted to the ftp site for the FPTT. This is addressed with the posting of information and handouts for this meeting on the SuWa public website.

### **Operational Scenarios**

John Haapala made presentation to the FPTT summarizing the operational scenarios that AEA has analyzed, based on the Physical, Hydrologic & Engineering Information (Information Items P3 – P5), Operating Scenarios OS-1b and ILF-1, Sept 9-11, 2014 by MWH information posted to the SuWa web site). OS-1b is a maximum load-following scenario being used as a boundary case with maximum variation on hourly, daily, and seasonal time scales. Flow duration curves were presented, along with flow through the turbines, flow through fixed cone valves and reservoir elevation duration curves. ILF-1 is an intermediate load-following scenario that includes using load following at other railbelt hydropower resources which can accommodate approximately one half of the railbelt's load variation. In addition, spring inflow forecasting was added to the model. Flow duration curves and reservoir elevation duration curves were presented for both scenarios. Under both operating scenarios the spillway gates are designed to not operate at less than the 50-year flood during full pool conditions. During simulation using 61 years of load and flow data at an hourly time scale, the spillway was never used. The simulations predict the turbines will run 100 percent of the time. The FPTT requested a summary of daily variation in outflow by month for both weekdays and weekends as a data request.

John H. noted that the simulation does not include ramping rate restrictions and uses environmental flow requirements from the 1980s studies. NMFS asked when those assumptions might be updated. AEA indicated that due to the ongoing nature of the studies that will support the development of environmental flows, there is not an ETA for an operational scenario with updated environmental flows at this time. NMFS asked how AEA was considering run of river (ROR) scenarios and suggested there were two ROR alternatives: ROR operations at certain times of the year (e.g., smolt outmigration, adult spawner returns) and simply ROR operations which would preclude a dam and reservoir of this magnitude. This issue was characterized as a sideboard discussion.

### **Brainstorm**

After lunch, the FPTT began brainstorming passage components. Passage options were uncoupled from collection options to maximize flexibility. Elements of fish passage facilities to be brainstormed included attraction, collection, transport and release. USFWS requested that fish passage facilities during a

lengthy construction period should be considered in addition to passage around a completed Project. Table 1 summarizes the upstream fish passage components identified during the afternoon brainstorming session.

After the afternoon brainstorming session, a discussion ensued regarding burbot passage considerations. The team discussed that burbot are poor swimmers with anguilliform swimming and low burst speeds. The biological information item includes specifics of swimming ability metrics for burbot. Burbot passage through denil fishways over low-head projects has been documented. Burbot are benthically oriented and spawn in winter. They are broadcast spawners that spawn in aggregations; the larvae drift downstream and become benthic.

### **Wrap-up for Day 1**

The next step will be to categorize upstream passage ideas by location, type of concept and the degree to which the element is supplemental to other concepts or components. The goal is to develop a list of concepts and identify any information needs. The team requested that R2 circulate comparable passage studies as an action item.

### **September 10, 2014**

Upon reconvening, Dana Postlewait reviewed the goals for the second day of the workshop. The goal was to complete the brainstorming list with notes about each brainstormed item, capture any reference facilities or known examples and prioritize options within each group of features as a first priority, second priority, supplemental feature or to be deferred. For deferred options the group should capture notes of the discussion and any fatal flaws.

Before beginning the team reviewed burbot ecology. Dana Schmidt indicated that Keenleyside Dam on the Columbia River had an adfluvial burbot population. For the first 4-5 years after the dam was completed, there was a tailrace fishery for burbot that subsequently collapsed providing clear evidence of a migratory component of the population. At Boundary dam, there is evidence of volitional adult downstream migration through outlet works – considerably off the bottom of the reservoir. NMFS questioned whether riverine burbot can successfully be passed into deep water habitats and survive. In Lake Champlain in Vermont, burbot were observed alongside lake trout. The team went on to review burbot life history, spawning timing, and diet. They spawn in tributaries and in off-channel habitats in winter. They get very large (90 cm). Larvae drift downstream although the exact timing is unknown. After approximately 1 month, they become benthic and disperse. Other systems have both fluvial and adfluvial life histories; but burbot life history has not been extensively studied in the Susitna basin. ADFG burbot studies from Lake Louise indicate that burbot spawn in late March and early April in the area lakes, and appears to be ice-free dependent. A sport fishery for burbot exists in upper lakes. Telemetry work in the 1980s showed spawning aggregations at the mouth of the Deshka River under ice. There is not abundant off-channel habitat in the Upper River so tributary habitat is likely important. The team agreed to an action item to compile available burbot information.

The team went on to review existing information about Chinook salmon in the Upper River. There is some evidence of tributary rearing; large Chinook salmon juveniles (>100mm) have been captured in downstream migrant traps in the tributaries. There was a discussion of where downstream-migrating Chinook salmon should be released; both the Tailwater of the dam and below Devils Canyon were discussed as potential release locations. The team asked about in-river residence time for adult Chinook salmon. Current studies have very low sample sizes for Chinook above Devils Canyon, but in general, in-river residence times are relatively short. NMFS pointed out that the current population abundance of Chinook salmon is low, relative to the 1980s. The team agreed that any feasible passage options should consider scalability. The team identified an additional information need to identify habitat expansion potential due to any changes to existing barriers.

It was noted that efforts to capture downstream migrants in tributaries should provide for upstream passage as well for both adult Chinook salmon and resident species. It was noted that road construction beyond the forebay is not very feasible.

It was noted that the Oshetna River is a major sediment contributor to the Susitna River.

The team discussed the potential advantages of a phased approach for fish passage facilities. It was noted that this would align with the study goal of identifying strategies for retrofit of fish passage features.

The team agreed that sorting by species and size should be considered at all systems at this stage of design. The team was reminded that the head of the reservoir ranges from PRM 222.5 to PRM 232.5 depending on reservoir pool. The team agreed that tributary collection options would make the most sense in tributaries used by Chinook salmon. All features should include flexibility for adaptive management of non-Chinook salmon species.

The USFWS requested examples of glacial systems with passage facilities. This was similar to the past information requested about arctic passage examples. Two issues of concern are ice blockage in tributaries and migration of Chinook salmon in glacial systems. Dana Schmidt completed a review of BC and Scandinavian projects, but did not produce a formal report. On the Kenai, Chinook salmon migrated and overwintered in a lake where overwinter survival was high. Production was driven by primary productivity. An action item was identified for Dana Schmidt to post the primary literature on glacial systems that he compiled to the FPTT ftp site.

The team asked why the Project was designed with no spill over the spillway. The answer was that TDG management is a concern for this high-head dam. NMFS asked what run-of-river operation looks like at this project. For the fish passage study, run-of-river operation would mean releases would match inflow with the pool held high. It was discussed that velocities through the pool under any operating scenario would be imperceptible.

The USFWS was able to speak with a Fairbanks ADFG fishery biologist during a short break and relayed the following information to the FPTT regarding burbot. The ADFG biologist described two glacial systems with burbot.; the Tanana and Kuskokwim Rivers. In the Tanana River, telemetry showed no

long-distance spawning migration but did show a feeding migration. In the Kuskokwim River study, the spawning migration was in September and October upstream to spawning areas hundreds of miles away. Estuarine rearing observed with associated piscivory. Spawning is highly synchronized. In one system spawning was in January, in the other system March-April. The biologist's professional opinion is that burbot spawning in the Susitna River would likely occur in January. An action item was noted for Betsy McCracken to provide burbot life history reports to the FPTT ftp site. The action item will be completed by Tim Sullivan per discussions during the December 3<sup>rd</sup> FPTT FPT meeting.

### **September 11, 2014**

Dana P. opened the third day of meetings by reviewing the goals for the day.

#### **Goals**

The first goal of the day was to complete the description and prioritization of downstream passage elements. The second goal was to review the development process for evaluation criteria and the evaluation matrix. This discussion will include an update on the Biological Performance Tool (BPT). The third goal was to review fish passage study goals and the final goal was to review the schedule work plan moving forward.

After Dana presented the goals, NMFS presented their goals for the final day of the workshop. NMFS's goals included: (1) completing prioritization of downstream passage elements, (2) reviewing the schedule moving forward, (3) clearly defining the roles and timing for development cartoons of passage systems, (4) defining a run-of-river operational scenario for the fish passage study that is coordinated with the Geomorphology and Water Quality studies and accommodates seasonal downstream passage needs, (5) identifying a "modern operational plan" that incorporates ramping rate restrictions and ecological flows as an information need, and (6) addressing outstanding action items.

#### **Brainstorm Review**

The FPTT reviewed and prioritized the remaining downstream passage elements as summarized in Table 1. An action item was identified for the AEA team to post Merwin trap examples on the FPTT ftp site.

During discussion the issue of ice formation upstream of the dam was raised. There were discussions that the ISR for the ice processes study provided helpful background information and an ice breakup technical memo would be available before the ISR meetings in October. Ice in the reservoir is also being analyzed by the environmental fluid dynamics code (EFDC) model in the Water Quality Study. Examples of passage facilities designed for ice conditions were discussed including heated trash racks. An action item was noted for the FPTT members to review the Ice Processes Technical Memo when it is available.

AEA invited John Zufelt, the lead for the Ice Processes Study, to discuss ice conditions in the reservoir and its tributaries and answer FPTT questions via conference call. John called in to the meeting and described likely conditions in the reservoir as being similar to a frozen lake. He anticipated significant frazzle ice moving downstream into the reservoir which could cause freeze-up jams where the mainstem and tributaries enter the reservoir. The pool would be falling throughout the winter, so the associated

ice cover and accumulation would set down along the shoreline and may form ice rings on the face of the dam that would cantilever out as the pool dropped. He estimated that by the end of December reservoir ice would be approximately 2 feet thick and would be approximately 3 feet thick by the end of March. Water velocities less than 1.5-2 ft/sec allow frazzle ice to stick. Anchor ice forms in 3-5 feet of water when frazzle ice is delivered but does not form under ice cover. Spring ice conditions would depend on weather and precipitation. The minimum pool is predicted in mid-late May. For reference, lakes in the Susitna Basin have ice in mid-May but it tends to be rotten and melting starts along the shoreline and is accelerated by wind. When asked about managing ice near the inlet structures, John mentioned that using a bubbler to bring warmer water from depth is used to keep structures ice free in other settings. Discussion of ice in the Oshetna River and Kosina Creek acknowledged the challenge of designing permanent structures. John suggested that piles of some sort, like bridge piers, could be used to protect permanent structures. John noted that the study has not been completed, so his quick observations will need to be supplemented and validated as the Ice Study progresses.

### **Meeting Recap**

After discussion, Dana reviewed the study goals. First to develop a clear understanding of *what needs to be done, what can be done, and how well we think it will work*. *What needs to be done* includes the range of species that should be accommodated, including Chinook salmon, possibly burbot, lamprey, and other resident fishes with an adaptive management approach. An action item is to take the new data and group species under representative passage targets and provide biological information and periodicity.

*What can be done* needs to include the three strategies outlined in the 9.11 RSP: 1) proposed Project without passage, 2) integrated upstream and downstream fish passage features into the current Project design, and 3) retrofit of upstream and downstream fish passage features into Project designed without passage. For each strategy we need to define what fish passage facilities look like, how they will affect operations, how well does the FPTT think they will work, how much they cost, and how certain the cost estimates are. The study will take an approach similar to a value engineering study: the FPTT's job is not to optimize ideas, but to define functions, estimate performance characteristics, and develop alternatives and cost estimates for comparative purposes.

NMFS asked if features not shown on the dam are fair game to consider for potential passage systems, the group and AEA agreed that they are for the initial analysis. The evaluation matrix and BPT will support comparison of passage concepts and sensitivity analysis regarding any uncertainties. The BPT incorporates hydrology and biological response functions to run 10,000 fish/day through scenarios for comparative purposes. Dana P. will circulate a draft evaluation matrix to the FPTT for input on criteria development for the next meeting.

For the next meeting, R2 will prepare proposed criteria, a mock-up evaluation matrix, and an update on the BPT under development for the FPTT's use. Dana P. initially proposed the next meeting be in mid-November. Due to schedule conflicts with other ILP processes, the next meeting will occur in January of

2015. Dana P. will facilitate distribution of a Doodle poll to identify a workable date, and R2 will provide an updated study schedule.

### **Attachments**

Attachment 1: Table 1-1, Brainstorm List of Ideas – see attached Excel file.

### **Action Items**

The following tables show the current status of Active action items, Parking Lot Items, and Completed action items. Note that a year designation was added to all item numbers as of these notes. This version also provided a comprehensive update to the list intended to supersede the 9/18/13 action item list.

ID	Active Action Items	Date Due	Responsibility	Distribution	Notes
04.09.13-06	Distribute report on glacial lakes study, if one was produced.	11/14/2014	D Schmidt; AEA	Email to study leads. Post after review. Potentially available on ARLIS ( <a href="http://www.arlis.org/resources/susitna-watana/">http://www.arlis.org/resources/susitna-watana/</a> )	9.13.14 - Dana Schmidt will reach out to Siberia and Scandinavia. Will confirm if any information exists, and will transmit status or summary and links to R2, for FPTT distribution.
04.10.13-08	Biological Performance Tool to be populated/created as straw man	12/19/2014	Tim Sullivan, Phil Hilgert	For review at FPTT meeting, planned for mid-January, 2015.	Will be distributed as a working model. If completed early, early distribution will occur.
9.19.13-10	Provide FPTT with otolith analyses of humpback whitefish	Once available	Stormy Haight	email	

ID	Active Action Items	Date Due	Responsibility	Distribution	Notes
9.19.13-15	Provide other studies using same framework as this study	11/14/14	Dana Postlewait	FTP site	<p>Options may include the following, depending on public release policy of owners.</p> <ul style="list-style-type: none"> <li>• Cowlitz example, 2008 workshop – Tacoma Power (Dana)</li> <li>• Fall Creek fish trap – USACE (Chick)</li> <li>• Peace River (Site C) – BC Hydro (Ed, Chick)</li> <li>• Freeman Dam, Panel output – United Water Cons Dist, CA (Dana, Dennis)</li> <li>• Baker Trap, FSC's – PSE (Dennis, Chick, Dana)</li> <li>• USACE Compendium (Chick)</li> <li>• Action Item – all make Others (individuals look)</li> </ul>
9.09.14-1	Finalize minutes from September 18-19, 2013 meetings. 9/11/14 update: see notes, ignore action items and review 9/11/14 action items.	Next meeting, planned for mid-January, 2015	All team members	September 1, 2014 email from Betsy McGregor	FPTT members to review and provide concurrence ready to finalize. Action items from 9/19/13 notes are superseded with 9/11/14 notes.
9.09.14-2	Review and update action item list	11/14/14	Dana Postlewait, Dan Turner, and Clint Smith	With 9/11/14 meeting notes	Done, FPTT members to review.

<u>ID</u>	<u>Active Action Items</u>	<u>Date Due</u>	<u>Responsibility</u>	<u>Distribution</u>	<u>Notes</u>
9.09.14-3	Identify stocking of Rainbow Trout in Upper River	12/19/14	Ron Benkert	Via email to Betsy McGregor	In time for planned mid-January, FPTT meeting.
9.09.14-4	Distinguish distribution above DC/below DC in Middle River in summary table	12/19/14	Tim Sullivan	Post to FPTT FTP site.	In time for planned mid-January, FPTT meeting.
9.09.14-5	Redistribute ftp information for 9/9-9/11 meeting.	11/14/14	Dana Postlewait	Post to FPTT FTP site.	Much of this is also on the meetings page of AEA's public SuWa web site.
9.09.14-6	The FPTT requested a summary of daily variation in outflow by month for both weekdays and weekends as a data request.	11/14/14, (contingent on AEA approval)	John Haapala, Dennis Dorratcague	Post to FPTT FTP site.	Dennis D. to coordinate.
9.10.14-1	Compile available burbot information	12/19/14	Tim Sullivan	Post to FPTT FTP site.	In time for planned mid-January, FPTT meeting.
9.10.14-2	Information need: ID habitat expansion potential due to any changes to existing barriers	12/19/14	Tim Sullivan, MaryLou Keefe	Discuss during review of Action Items at next meeting. Table of Upper River tributaries with barriers is included in Fish Passage Barrier's ISR 9.12.	In time for planned mid-January, FPTT meeting.

<u>ID</u>	<u>Active Action Items</u>	<u>Date Due</u>	<u>Responsibility</u>	<u>Distribution</u>	<u>Notes</u>
9.10.14-3	Share primary literature on glacial systems	12/19/14	Dana Schmidt	Post to FPTT FTP Site	See also 04.09.13-06
9.10.14-4	Confirm TDG implications of spill over current design	12/19/14	Dennis Dorratcague,	Post to FPTT FTP Site	Dennis Dorratcague (MWH) to prepare brief technical memo.
9.10.14-5	Distribute burbot life history reports from USFWS biologist	11/15/14	Betsy McCracken  (Tim Sullivan will now post as of 12/03/2014 FPTT FP meeting)	Post to FPTT FTP Site	In time to compile other information per 9.10.14-1
9.11.14-1	Share Merwin trap examples	11/15/14	Dana Postlewait	Post to FPTT FTP Site	C. Sweeney transmitted example to D. Postlewait
9.11.14-2	Review the Ice Processes Technical Memo when it is available.	TBD	FPTT	AEA SuWa Website	Ongoing, to be discussed at future meetings when significant milestones are completed.
9.11.14-3	Group species under representative passage targets and provide biological information and periodicity for Info Item B12.	12/19/14	Tim Sullivan, MaryLou Keefe	Post to FPTT FTP Site	In time for planned mid-January, FPTT meeting.

<u>ID</u>	<u>Active Action Items</u>	<u>Date Due</u>	<u>Responsibility</u>	<u>Distribution</u>	<u>Notes</u>
9.11.14-4	Circulate a draft evaluation matrix, and criteria	12/19/14	Dana Postlewait	Post to FPTT FTP Site	In time for planned mid-January, FPTT meeting.
9.11.14-5	Doodle poll to schedule January meeting	11/15/14	Dana Postlewait, Betsy McGregor	Via email	To set date for mid-January, 2015 meeting

<u>ID</u>	<u>Parking Lot Item</u>	<u>Date Noted</u>	<u>Responsibility</u>	<u>Distribution</u>	<u>Notes</u>
02.22.13-01	Identify Strategy Statement (e.g., Senate Bill; PAD)	3/31/2013	AEA	Will be in FSP, ISR	
02.22.13-02	Clarify meaning of “retrofit” with space/time components	3/8/2013	R2	Will be in FSP and ISR	
02.22.13-06	Include discrepancies in data to information table	3/8/2013	R2	Will be in final product.	
04.10.13-04	Add a series or component to the Information Needs table that relate to management considerations of the target species (policy information on species management or how to handle nuisance species)	9/3/2013	Dana Postlewait, Stormy Haught	Stormy to go back to ADF&G staff and try and get more information on what might be policy considerations that could be identified. Dana going to draft template for June 24, 2013.	ADF&G finds it is premature to comment. They prefer 1-2 years of field data before considerations are made. - parking lot item 07.09-02 created
07.09.13-02	ADF& G policy information on species management or how to handle nuisance species	7/9/2013	Dana Postlewait, Stormy Haught	ADF&G finds it is premature to comment. They prefer 1-2	ADF&G will comment in year 2015 after field data is

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				years of field data before considerations are made.	available.

<u>ID</u>	<u>Completed Action Items</u>	<u>Date Completed</u>	<u>Responsibility</u>	<u>Distribution</u>	<u>Notes</u>
02.22.13-03	Confirm next meeting location	3/8/2013	AEA		Done. Next meeting will be held in Bellevue, WA. Future meetings will be held at most cost-effective locations.
02.22.13-04	Data needs table: Input from TWG on list of items	3/8/2013	All participants		
02.22.13-05	Add changes in spawning and rearing habitat in proposed inundation zone to data needs table	3/8/2013	R2		
02.22.13-07	Produce/distribute communications protocol from PAD (cc: Betsy, Ed, Sue)	3/8/2013	McMillen		Done 3/8/2013.
02.22.13-08	Standing agenda item for agendas – review and approve previous meeting notes and future meeting schedule	NA	NA		
02.22.13-09	Follow-up with others re: future participation in TWG; FERC (AEA), EPA (Catherine Berg), NGOs (AEA), ADF&G (AEA), FWS (Sue Walker), ADNR (Marie Steele), Jan Konigsberg (AEA)	3/20/2013	AEA, Catherine Berg, Marie Steele	Email	
02.22.13-10	Meeting protocol – summarize action items, decisions, parking lot items	NA	NA		
02.22.13-11	Identify other fish passage at high head dam experts	3/20/2013	MWH, R2, Ed Meyer		Done 3/20/2013.

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02.22.13-12	Issue updated meeting and workshop calendar (Gantt chart)	3/20/2013	R2	FPTT email	Done 3/20/2013.
02.22.13-13	Provide a list of all Susitna River species and life stages. Provide rationale of species not considered to travel to dam site	3/26/2013	R2	Website: Meeting Materials for April 9 and 10; Listserve email	
02.22.13-14	Distribute updated data needs table and data synthesis to TWG	3/26/2013	R2	Website: Meeting Materials for April 9 and 10; Listserve email	Done 3/26/2013.
02.22.13-15	Provide a list of all Susitna River species and life stages. Provide rationale of species not considered to travel to dam site	3/26/2013	R2		Done 3/26/2013.
02.22.13-16	Distribute sample biological tool spreadsheet and description of tool	3/26/2013	R2	Website: Meeting Materials for April 9 and 10; Listserve email	Done 3/26/2013.
02.22.13-17	Presentation of videography at first workshop	4/9/2013	AEA	April 9 and 10, 2013 FPTT	
03.20.13-01	Distribute MSWord document of 2/22/13 meeting notes to attendees for edits	3/20/2013	Kathryn Peltier	Email	Done. Betsy McGregor distributed to FPTT 3/22/2013.
03.20.13-	Create an archive list of completed action	3/20/2013	Kathryn	Email	Done. Distributed to FPTT 4/8/2013.

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02	items		Peltier		
03.20.13-03	Update communication protocol and distribute	3/22/2013	Kathryn Peltier	Email	Done. Distributed to FPTT in 3/20/2013 mtg notes on 4/8/2013.
03.20.13-04	Distribute list of all Fish Passage team members	3/22/2013	Kathryn Peltier	Email	Done. Distributed to FPTT on 4/8/2013.
03.20.13-05	Provide Ed Meyer with Dana Schmidt's resume	3/21/2013	MaryLou Keefe	Email	Done. MaryLou Keefe sent to Ed Meyer 3/21/2013.
03.20.13-06	Review Dana Schmidt's and Chick Sweeney's resumes as high head dam fish passage experts	3/22/2013	Ed Meyer	Email	Done.
03.20.13-07	Add to applicable entrainment reference in the data needs table	3/26/2013	MaryLou Keefe	Data Needs Table	Done.
03.20.13-08	Include reservoir effects on migration timing is in the data needs table	3/26/2013	MaryLou Keefe	Data Needs Table	Done.
03.20.13-09	Provide MaryLouise Keefe with a detailed description regarding data needs of trophic cascade information	3/25/2013	Jeff Davis	Email, Data Needs Table	Done 3/26/2013.
03.20.13-10	Distribute draft Agenda for April 9 and 10 Fish Passage Meeting	3/27/2013	AEA	Website: Meeting Materials for April 9 and 10; Listserve email	

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04.09.13-01	Provide edits to 2/22/2013 FPTT meeting notes to AEA	Complete. Notes posted	FPTT 2/22/2013 meeting attendees	Email for edits. Susitna- watanahydro.org	
04.09.13-02	Provide edits to 3/20/2013 FPTT meeting notes to AEA	Complete. Notes posted	FPTT 3/20/2013 meeting attendees	Email for edits. Susitna- watanahydro.org	
04.09.13-03	AEA to discuss its choice of additional fish passage experts with Ed Meyer/Sue Walker	Complete. Added Dr. Al Giorgi to FPTT	Wayne Dyok	Phone call	
04.09.13-04	Provide FPTT Information Needs Table in MSWord	Complete	Betsy McGregor	Email	Dana Postlewait distributed by email for Betsy McGregor.
04.09.13-05	Include appendix titles in website link description/title	Complete. Posted	Justin Crowther	Susitna- watanahydro.org	
04.09.13-08	Flow duration data in Excel; data presented today plus totals	Posted	John Haapala, Dennis Dorratcague	Susitna- watanahydro.org	Dennis Dorratcague to reprint with pagination corrected for re-posting.
04.09.13-09	Need guidance from Wayne/AEA on how run of river scenario will be handled; and importantly when some scenarios with environmental flows will be available to be	See 05.21-02	W Dyok		Merged with action item 5.21-02

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	modeled and available to the FPTT (in between run of river and maximum load following).				
04.09.13-10	Find out from Stuart when he will be completed with estimating flows in tributaries to reservoirs and just below dam – when that data will be available to the fish passage study team.	Complete.	MaryLou		Stage data to be collected this year, and stage/ discharge relationships to be developed in 2014 with results available after 2014 season.
04.09-12	Distribute synthesis book to hand out before July 8-12 site visit. [now planned for Sept 17-19]	9/3/2013	Dana Postlewait, Dennis Dorratcague, Tim Sullivan	Planned for email and posting Susitna-watanahydro.org	FTP site link emailed by Dana Postlewait on 9/4/13
04.10.13-01	Update biological appendices to account for other target species added to Target Species list (those added into Table 1- No. B1 Biological Data Needs)	9/3/2013	MaryLou Keefe, Tim Sullivan	Nuisance species is another list and to date we have not included periodicity type information on those nuisance species.	Dana Postlewait provided electronically on 9/4/13
04.10.13-02	Fix appendix B2 to note lake trout are native	9/3/2013	Tim Sullivan		Dana Postlewait provided electronically on 9/4/13

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04.10.13-03	Clarify Table B3 headings/categories and if appropriate update periods.	9/3/2013	Tim Sullivan	If needed follow up with smaller group of Stormy Haught, Jeff Davis, MaryLou Keefe.	Dana Postlewait provided electronically on 9/4/13
04.10.13-05	Take out Adult Chinook relative abundance bulleted item in the B7 slide (on relative abundance)	9/3/2013	Tim Sullivan	At request of Jeff Davis and Sue Walker – not really needed	Dana Postlewait provided electronically on 9/4/13
04.10.13-06	Create combined table to address design criteria information for B3-B6 for target species	9/3/2013	Tim Sullivan, MaryLou Keefe		Dana Postlewait provided electronically on 9/4/13
04.10.13-07	Obtain Chick Sweeney's input to Evaluation of Alternatives Matrix	9/3/2013	Chick Sweeney, Tim Sullivan, Dana Postlewait		Chick will provide draft to Dana Postlewait and Tim Sullivan by 8/26/2013. Tim and Dana to add to 9/3/2013 distribution package.
04.10.13-09	Compile available mapping of tributaries with plan/profile information to extent possible prior to the workshop	9/3/2013	Dennis Dorratcague, Dana Postlewait	For review/use at brainstorming meeting.	Dana Postlewait provided electronically on 9/4/13 and at the site visit.
05.21.13-01	Provide remaining edits to April 9-10, 2013 Workshop #1 meeting notes to AEA	5/24/2013	Jeff Davis and Sue Walker	Email	

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05.21.13-02	AEA to follow up off-line with B. Long and S. Walker regarding operational scenarios.  Need guidance from Wayne/AEA on how run of river scenario will be handled; and importantly when some scenarios with environmental flows will be available to be modeled and available to the FPTT (in between run of river and maximum load following).	7/9/2013	Wayne Dyok	Phone call	Sue Walker will remind Wayne 7/9/2013 call.
05.21.13-04	Provide edits to Information Needs List and update table	Edits to AEA by 6/18/2013	Workshop #1 participants	Betsy McGregor to email MS-Word version participants for editing. Updated table distributed for 7/9/2013 meeting.	Distributed 6/24/2013
05.21.13-05	Doodle Poll for site reconnaissance	5/31/2013	Dana Postlewait, Betsy McGregor	Email	Completed confirming 9/17-9/20
05.21.13-06	Rework schedule/meeting list including 7/9/13 check-in and March 18-19, 2014 brainstorm session	7/15/2013	Dana Postlewait	Email	Done - Distributed with draft Meeting Notes on 7/23/2013

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05.21.13-07	Draft notes of 5/21/2013 check-in meeting and action items	5/31/2013	Steve Padula, Dana Postlewait, Tim Sullivan	Email	
07.09.13-01	Materials to be distributed 2 weeks prior to site visit - AI 04.09-12 - AI 04.10-04 - AI 04.10-07 - AI 04.10-09 - Information Needs Appendices - Safety/gear requirements for site visit - Workbook	9/3/2013			
07.09.13-03	Review of the Information Needs Table	7/23/2013	FPTT	Email to Dana Postlewait, with cc to Betsy McGregor.	R2 and MWH will consider comments for update to Table, to be distributed on 9/3/2013. (no comments received)
07.09.13-05; 07.09.13-06	Clarify attendance by "other participants and contacts": - Eric Rothwell (NMFS) - CIRI - FERC – Matt Cutlip - NGOs	9/18/2013	Betsy McGregor	Update for next meeting	

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07.09.13-07	Confirm site tour travel is feasible based on latest weather.	9/16/2013, by 17:00 ADT	Dana Postlewait	Email to meeting attendees	Dana Postlewait will confirm feasibility of helicopter travel based on latest weather forecast, and coordinate with Betsy McGregor.
04.09.13-07; 04.09.13-11	Rob Plotnikoff to request John Hamrick provide some background information on simulating reservoirs and fish movements based on past experience; Determine when reservoir ice study will have some results to report to the Fish Passage group, or at least some findings of preliminary observations, particularly effects of ice formation and breakup at tributary mouths in reservoir.	9/13/14	Rob Plotnikoff	Conference call with John Zufelt (Ice study lead)	9/11/14 – R2 (MaryLou K and D Postlewait) will coordinate with Ice Studies to provide any updates at future FPTT meetings. FPTT can follow ice studies independently for other updates through their progress reports. Close action item.
04.09.13-13	Provide updated wind speed data in excel file format to assist in estimating wave heights/loads	9/11/14	Dennis Dorratcague	Posted to SuWa web site	Raw wind data from SuWa public web site.
05.21.13-03	AEA to follow up with Rob Plotnikoff regarding the timing/availability of ice modeling results	9/13/14	Betsy McGregor	Conference call with John Zufelt (Ice study lead) at 9/13/14 meeting.	Combined with 04.09-11. Also follow ongoing ice studies. Also see 9/11/14 meeting note text.
07.09.13-04	Contact CIRI regarding their concern (as expressed by Sue Walker) with AEA hosting meeting outside of Alaska	After 1/1/14	Wayne Dyok	Conducted via meeting coordination and planning calls.	AEA is managing meeting travel needs to minimize FPTT travel costs.

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09.18.13-01	Compile updated mapping of tributaries with plan/profile information, low/high pool, site locations, updated data and locations of documented fish/spawning	9/11/14	Dana Postlewait	With 9/11 meeting notes, and posted to FPTT FTP site	Initial maps are done to confirm what information exists, additional info will be developed by R2 and MWH to meet study needs with alternatives.
09.18.13-02	Provide Dana Postlewait with mapping needs and details identified on the maps.	9/11/14	See notes	n/a	No input received, FPTT has adequate info without further input, close action item.
09.18.13-03	Distribute an agenda for a check in call on 1/16/14 at 10am-12pm (AK time)	n/a	Dana Postlewait	n/a	Not needed due to study delay early 2014. Info presented at 9/11 meeting supersedes this need. Close action item.
09.18.13-04	Coordinate with Wayne and MWH to determine reasonable operation scenarios.	9/11/14	Betsy McGregor, Dennis Dorratcague	9/9-9/11 meeting discussion	See OS-1b, ILF-1, and ROR discussions.
09.18.13-05	Determine turnover time necessary for engineering to refining operation scenario	9/9/14	Dennis Dorratcague	9/9-9/11 meeting discussion	Runs are now done, see 09.18-04.
09.18.13-06	Review of the updated (as of 9.18.13) Information Needs Table	9/11/14	FPTT	n/a	No info received from any FPTT members by deadline. Info needs table Rev 6 is latest so work from that. Note this is still a living document. Close action item.

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09.18.13-07	Clarify public status of fish passage meetings	9/18/13	Wayne Dyok	9/18/13 FPTT meeting.	Meetings are open for observation. CEII info restricted to FPTT members.
09.18.13-08	Provide feedback on Appx B, Table 1 and Table 2				Appx B, Table 1 - split juvenile and adult into separate rows - add caveat explaining that this table's purpose is to provide general information as an input to the document - add upstream juvenile/sub-adult migration
09.18.13-09	Provide a mock-up table with synthesis of fish run timing over hydro project with ice influence	9/24/13	Chick Sweeney	Dana Postlewait via email	Will be considered with other input for future use.
09.19.13-11	Provide a sample evaluation process (dummy Project)	10/2/14	Dana Postlewait, Chick Sweeney	9/11/14 meeting notes.	Close action item. AEA will provide specific criteria and process overview specific to what will be utilized for this project by next meeting

<u>ID</u>	<u>Completed Action Items</u>	<u>Date Completed</u>	<u>Responsibility</u>	<u>Distribution</u>	<u>Notes</u>
09.19.13-12	Distribute draft agenda for brainstorming meeting <ul style="list-style-type: none"> <li>- Dates are 3/18/14 – 3/20/14</li> <li>- At Van Ness Feldman’s downtown Seattle office</li> <li>- First half of first day = review updated data</li> <li>- Bracketed third day</li> </ul>	9/11/14	Dana Postlewait	Via email and FPTT FTP site.	Close action item. Brainstorm agenda and meeting are complete as of 9/11/14. Was conducted at MWH Bellevue, WA office.
09.19.13-13	Confirm that turbidity response modeling in the reservoir will be available for the March brainstorming meeting	9/11/14	Betsy McGregor	Meeting discussion	Close action item. FPTT to stay apprised of other ongoing studies.
09.19.13-14	Populate evaluation matrix with straw men and distribute to FPTT for feedback.	9/11/14	Dana P, Dennis D.	Meeting discussion and 9/11/14 notes.	Close action item, see 9.19.13-11. AEA will provide specific criteria and process overview specific to what will be utilized for this project by next meeting in Jan, 2015. Remember, evaluation matrix is intended to challenge alternatives to improve all options, and compare alternatives relative to each other. See 9/11/14 meeting notes.

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09.19.13-16	Follow up with point of contact at various fish passage facilities. Determine when fish passage would likely be occurring, which species, and if a tour would be possible at times that correspond with fish passage meeting(s) in the area.	9/11/14	Dana P	Prior to 9/11/14 meeting.	Agencies coordinated their own tours prior to brainstorm meeting. Close action item, not needed.
09.19.13-17	Provide photos of relevant fish passage facilities to post on wall during brainstorm meeting in March, 2014	9/11/14	Dana P	n/a	Sample photos were shown at meeting as needed. Additional photos will be provided as applicable with development of alternatives. Close action item, not needed given current status.