

# Susitna-Watana Hydroelectric Project Document

## ARLIS Uniform Cover Page

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<p><b>Notes:</b></p> <p>Contents: Part A. Transcripts -- Part B. Agenda and presentations.</p> <p>In the electronic version, this cover page and the cover letter precede Part A only.</p>		

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November 14, 2014

Ms. Kimberly D. Bose  
Secretary  
Federal Energy Regulatory Commission  
888 First Street, N.E.  
Washington, D.C. 20426

**Re: Susitna-Watana Hydroelectric Project, Project No. 14241-000**

**Filing of Initial Study Plan Meetings Transcripts and Additional Information in  
Response to October 2014 Initial Study Plan Meetings**

Dear Secretary Bose:

By letter dated January 28, 2014, the Federal Energy Regulatory Commission (Commission or FERC) modified the procedural schedule for the preparation and review of the Initial Study Report (ISR) for the proposed Susitna-Watana Hydroelectric Project, FERC Project No. 14241 (Project).<sup>1</sup> As required by the Commission's January 28 letter, the Alaska Energy Authority (AEA) filed the ISR with the Commission on June 3, 2014 and conducted ISR meetings on October 15, 16, 17, 21, 22, and 23, 2014. Attached as Attachments A-1 through F-2 are the written transcripts (along with the agenda and PowerPoint presentations) for these ISR meetings.

During the October ISR meetings, AEA and licensing participants identified certain technical memoranda and other information that AEA would file with the Commission by November 15, 2014. In accordance, AEA is filing and distributing the following technical memoranda and other information:

- Attachment G: *Glacier and Runoff Changes (Study 7.7) and Fluvial Geomorphology (Study 6.5) - Assessment of the Potential for Changes in Sediment Delivery to Watana Reservoir Due to Glacial Surges Technical Memorandum*. This technical memorandum documents AEA's analysis of the potential changes to sediment delivery from the upper Susitna watershed into the Project's reservoir from glacial surges.
- Attachment H: *Riparian Instream Flow (Study 8.6) and Fluvial Geomorphology (Study 6.6) - Dam Effects on Downstream Channel and Floodplain Geomorphology and Riparian Plant Communities and Ecosystems – Literature Review Technical Memorandum*. This literature review technical

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<sup>1</sup> Letter from Jeff Wright, FERC Office of Energy Projects, to Wayne Dyok, Alaska Energy Authority, Project No. 14241-000 (issued Jan. 28, 2014).

memorandum synthesizes historic physical and biologic data for the Susitna River floodplain vegetation (including 1980s studies), studies of hydro project impacts on downstream floodplain plant communities, and studies of un-impacted floodplain plant community successional processes.

- Attachment I: *Susitna River Fish Distribution and Abundance Implementation Plan, Appendix 3. Protocol for Site-Specific Gear Type Selection, Version 5.* In accordance with the fish distribution and abundance studies, as described in Revised Study Plan (RSP) Sections 9.5 and 9.6 and in the Fish Distribution and Abundance Implementation Plan, this appendix establishes the protocol for site-specific gear type selection for fish surveys. Throughout study plan implementation, AEA has updated this appendix as needed to provide consistent direction to all field teams. Version 1 of Appendix 3 was originally filed with the Fish Distribution and Abundance Implementation Plan in March 2013. That version was updated twice (Versions 2 and 3) during the 2013 field season to accommodate protocol changes that related to FERC's April 1, 2013 Study Plan Determination, field permits, and lessons learned during study implementation. Version 4 was the protocol used for the 2014 field season and was updated with respect to the prioritization of gear use and based on 2013 data collected. This version herein, Version 5, will be followed during the 2015 field season.
- Attachment J: *Fish Distribution and Abundance in the Upper and Middle/Lower Susitna River (Studies 9.5 and 9.6): Draft Chinook and Coho Salmon Identification Protocol.* This document established a Chinook and coho salmon identification protocol to support accurate and consistent field identification across field teams. It will allow for additional quality control and assurance of field identification calls and for estimation and reporting of any field identification error that may occur in future sampling efforts.
- Attachment K: *Characterization and Mapping of Aquatic Habitats (9.9), Errata to Initial Study Report Part A - Appendix A, Remote Line Mapping, 2012.* This errata provides a corrected version of map book for Remote Line Mapping, 2012. The version filed with the ISR (June 3, 2014) used a data query to build the maps in geomorphic reaches MR-1 to UR-5 that mistakenly did not include side slough habitat, so that no side sloughs were depicted on the Appendix A maps 1 through 21. This version was corrected by including side slough habitat in the data query for geomorphic reaches MR-1 to UR-5. This version now includes side sloughs.
- Attachment L: *Characterization and Mapping of Aquatic Habitats Study 9.9, Revised Map Book for 2012 Remote Line Mapping.* This map book represents an update to the version published on June 3, 2014 with the Study 9.9 Initial Study Report and the errata provided concurrently with this filing (see Attachment K). The maps presented include all macrohabitat and mesohabitat line identifications available in the 2012 Remote Line Mapping ArcGIS

shapefile. This map book should be considered a full replacement for previous versions and represents the final product for the 2012 remote line habitat mapping effort.

- Attachment M: *Study of Fish Passage Barriers in the Middle and Upper Susitna River and Susitna Tributaries (Study 9.12), Fish Passage Criteria Technical Memorandum*. This technical memorandum presents a proposed final list of fish species that will be included in the fish barrier analysis as well as depth, leaping and velocity passage criteria for selected fish species. AEA previously consulted with the federal agencies and other licensing participants regarding the information within the technical memorandum during a March 19, 2014 Fisheries Technical Meeting.

In addition to the technical memoranda and other information identified above, AEA is filing a short errata (Attachment N) to the *Mercury Assessment and Potential for Bioaccumulation Study (Study 5.7), Evaluation of Continued Mercury Monitoring Beyond 2014 Technical Memorandum*. This technical memorandum, which was originally filed on September 30, 2014, evaluates the need for continued monitoring of mercury data beyond 2014 and whether the existing data collection efforts are sufficient to satisfy objectives for characterizing baseline mercury conditions in the Susitna River and tributaries (RSP Section 5.7.1). Since the filing of this TM and based upon the ongoing QA/QC of the data reported in that TM, AEA discovered errors in the TM. The attached TM corrects those errors. Additionally, the errata corrects corresponding errors in the Mercury Assessment and Potential for Bioaccumulation presentation presented during the October 16, 2014 ISR meeting.

Finally, AEA notes that data collected during the Study Plan implementation, to the extent they have been verified through AEA's quality assurance and quality control (QAQC) procedures and are publicly available, can be accessed at [http://gis.suhydro.org/isr\\_mtg](http://gis.suhydro.org/isr_mtg). On November 14, 2014, AEA posted the following data to this website:

- *Baseline Water Quality Data (Study 5.5)*, 2013 QAQC water quality data and DVRs per the Quality Assurance Project Plan.
- *Breeding Survey Study of Landbirds and Shorebirds (Study 10.16)*, cumulative 2013-2014 data.
- *Characterization and Mapping of Aquatic Habitats (Study 9.9)*, ArcGIS shapefile "ISR\_9\_9\_AQHAB\_RemoteLineMapping\_2012.shp" used to generate the maps in Attachment L.

AEA appreciates the opportunity to provide this additional information to the Commission and licensing participants, which it believes will be helpful in determining the appropriate development of the 2015 study plan as set forth in the ISR. If you have questions concerning this submission please contact me at wdyok@aidea.org or (907) 771-3955.

Sincerely,

A handwritten signature in black ink that reads "Wayne M. Dyok". The signature is written in a cursive style with a horizontal line underneath the name.

Wayne Dyok  
Project Manager  
Alaska Energy Authority

Attachments

cc: Distribution List (w/o Attachments)

**Susitna-Watana Hydroelectric Project  
(FERC No. 14241)**

**Initial Study Report Meetings  
October 15, 2014  
Part A – Transcripts**

**Millennium Hotel  
4800 Spenard Road  
Anchorage, Alaska 99517**

Filed November 15, 2014



# SUSITNA-WATANA HYDRO

## Agenda and Schedule

### Initial Study Report (ISR) Meetings

#### Fish and Aquatics (Studies 9.05 - 9.17)

Millennium Hotel

4800 Spenard Road

Anchorage, Alaska

October 15, 2014

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#### **ATTENDEES**

Emily Anderson, Wild Salmon Center  
Julie Anderson, Alaska Energy Authority  
Nate Anderson, Alaska Energy Authority  
Greg Auble, U.S. Geological Survey  
Andrew Barclay, Alaska Department of Fish and Game  
Ron Benkert, Alaska Department of Fish and Game  
Mike Bethers, Alaska Department of Fish and Game  
Brian Bjorkquist, Department of Law  
Jessica Blizzard, Tetra Tech  
Martin Bozeman, Alaska Energy Authority  
Phil Brna, U.S. Fish and Wildlife Service  
Bryan Carey, Alaska Energy Authority  
John Clark, St. Hubert Research Group  
Justin Crowther, Alaska Energy Authority  
Scott Crowther  
Jennifer Curtis (phone), Environmental Protection Agency  
Matt Cutlip, Federal Energy Regulatory Commission  
Jeff Davis, Aquatic Restoration and Research Institute  
Molly Dischner, Alaska Journal of Commerce  
Connie Downing, Tyonek  
Wayne Dyok, Alaska Energy Authority

Bill Fullerton, Tetra Tech  
Sara Fisher-Goad, Alaska Energy Authority  
Hal Geiger, St. Hubert Research Group  
Jerry George, R2 Resource Consultants  
Harry Gibbons, Tetra Tech  
George Gilmour, Meridian Environmental  
Dara Glass, CIRI  
Domoni Glass, Environ  
Chris Habicht, Alaska Department of Fish and Game  
Leanne Hanson, U.S. Geological Survey  
Mike Harvey, Tetra Tech  
Stormy Haught, U.S. Fish and Game  
Jeremy Hayes, MSI Communication  
Sandie Hayes, Alaska Energy Authority  
Phil Hilgert, R2 Resource Consultants  
Graham Hill, Northwest Hydraulic Consultants  
Chris Holmquist Johnson, U.S. Geological Survey  
Darren Ireland (phone), LGL Alaska  
Nick Jayjack, Federal Energy Regulatory Commission  
Peter Jenson (sp) (phone), LGL  
Marylouise Keefe, R2 Resource Consultants  
Joe Klein, Alaska Department of Fish and Game  
Jan Konigsberg (phone), Unidentified  
Ellen Lance, U.S. Fish and Wildlife Service  
Keri Lestyk, National Marine Fisheries Service  
Becky Long, Susitna River Coalition  
Soch Lor, U.S. Fish and Wildlife Service  
Matt Love, Van Ness Feldman  
Betsy McGregor, Alaska Energy Authority  
Laurie Marczak (phone), R2 Resource Consultants  
Betsy McCracken, U.S. Fish and Wildlife Service  
Megan McFee, Unidentified  
Tom McMahan, Alaska Department of Fish and Game  
Joe Merz, Cramer Fish Sciences



Frank Mielle (sp), Alaska Unidentified  
Mandy Migura, National Marine Fisheries Services  
Bryan Nass, LGL Alaska Research Associates  
Sarah O'Neil, Trout Unlimited  
Tim Nightengale (phone), R2 Resource Consultants  
Doug Ott, Alaska Energy Authority  
Steve Padula, McMillen  
Kathryn Peitier, McMillen  
Ryan Peterson, Independent Media  
Kevin Petrone, R2 Resource Consultants  
Guy Phillips, Kier Associates  
Dana Postlewait, R2 Resource Consultants  
Dudley Reiser, R2 Resource Consultants  
Nikita Robinson, Alaska Energy Authority  
Greg Ruggerone, NRC  
Alice Shelly, R2 Resource Consultants  
Alan Shepherd (phone), Unidentified  
David Smith (phone), LGL  
Sam Snyder, Unidentified  
Marie Steele, Alaska Department of Natural Resources  
Kai Steimle, R2 Resource Consultants  
Miranda Studstill, Accu-Type Depositions  
Wayne Swaney, Stillwater Sciences  
Gene Therriault, Alaska Energy Authority  
Cassie Thomas, National Park Service  
Rachel Thompson, Alaska Energy Authority  
Chris Tillman, Alaska Energy Authority  
Chris Unidentified, Unidentified  
John Unidentified, Representative Josephson's staff  
Unidentified Speaker (phone)  
Unidentified Speaker (phone), LGL  
Unidentified Speaker (phone), National Park Service  
Sue Walker, National Marine Fisheries Service  
Richard Wilson, Alaska Unidentified

Fred Winchell, Louis Berger  
Whitney Wolff, Talkeetna Community Council  
Mike Wood, Susitna River Coalition  
Richard Yanuse, Alaska Department of Fish and Game  
Ed Zapel, Northwest Hydraulic Consultants  
Lyle Zevenbergen, Tetra Tech  
Craig Ziolkowski, LGL

## **INTRODUCTION**

MR. PADULA: Good morning. I'm going to be your facilitator for today and the next couple of days of meetings. This is AEA's formal Initial Study Report meetings. We have six days that have been scheduled over the next couple of weeks, and where's Justin?

UNIDENTIFIED SPEAKER: Do you want some water?

MR. PADULA: So here is just a summary statement of purpose of this meeting, following the filing of the ISR, the applicant to hold a meeting, and participants and Commission staff to discuss study results, and then potential proposals to modify the study plan going forward, in light of the efforts that has been done to date. So that's what we're all about today. Hopefully, folks are ready

to focus on that.

A little bit of housekeeping, if we have any sort of an emergency, these exits will get you out into a hallway, and also, straight back out the hall, you'll notice there are stairs immediately to the right. If anyone has a personal emergency, the restrooms are straight out and down to the end of the hall to the right.

We probably have a number of folks on the phone and we're going to get to introductions. Again, just from an etiquette perspective, please identify yourself clearly, and if you're representing an organization, we have a court reporter here today, who will want to get you accurately into the record.

There are microphones here at the table, and there's also going to be a roaming microphone, if we have any folks who have got comments or questions, who are not up front. Just as a word of caution, these microphones are sensitive and they'll pick up pretty much anything that is said in their vicinity. So if there's something you really don't want to end up in the official transcript, use your discretion, because it will go officially into the transcript, if it's picked up on the microphone.

We'll take breaks for lunch and a couple of breaks, morning and afternoon. If

anyone feels there is a need for, you know, caucusing, there's, you know, opportunity to do that, please request it, opportunities out in the hall here for folks to meet on that basis. I request that you keep those short, because everybody else will still be here, waiting for you to come back, and again, from an etiquette perspective, it's really helpful if you don't talk over one another, so the court reporter can clearly get information down on all of us.

So with that, I think I will move to introductions. So again, if we could work our way around the table, and then we'll go to the back of the room, just very quickly, name and organization that you represent, if that's appropriate. Let me start back there.

MR. REISER: Yeah (affirmative), I'm Dudley Reiser, with R2 Resource Consultants. I'm the instream flow program lead.

MR. NASS: Bryan Nass, LGL Alaska Research Associates, Senior Fisheries Biologist, working on (indiscernible - interference with microphone) primarily to one of the precepts.

MR. GEORGE: Jerry George, R2 Resource Consultants, study for the middle, lower, and upper FDA studies.

MS. KEEFE: MaryLouise Keefe, R2 Resource Consultants.

MS. STEIMLE: Kai Steimle with R2 Resource Consultants.

MS. SHELLY: Alice Shelly with R2 Resource Consultants.

MR. DYOK: Good morning, Wayne Dyok, Alaska Energy Authority.

MS. MCGREGOR: Betsy McGregor, Alaska Energy Authority.

MR. LOVE: Matt Love, Van Ness Feldman.

MS. LOR: I'm Soch Lor with the U.S. Fish and Wildlife Service.

MS. LANCE: And Ellen Lance, U.S. Fish and Wildlife Service.

MS. MCCRACKEN: Betsy McCracken, U.S. Fish and Wildlife Service.

MR. DAVIS: Jeff Davis with the Aquatic Restoration and Research Institute.

MS. WALKER: Sue Walker, National Marine Fisheries Service.

MR. JAYJACK: Good morning, I'm Nick Jayjack with FERC.

MR. CUTLIP: Matt Cutlip, also with FERC.

MS. STEELE: Good morning, I'm Marie Steele with the Alaska Department  
of Natural Resources.

MR. KLEIN: Joe Klein, Alaska Department of Fish and Game.

MR. SWANEY: Wayne Swaney, Stillwater Science and FERC contracting.

MR. WINCHELL: Fred Winchell, Louis Berger, FERC contracting.

MR. TILLMAN: Chris Tillman, Alaska Energy Authority.

MS. THOMPSON: Rachel Thompson, Alaska Energy Authority.

MR. ZAPEL: Ed Zapel, Northwest Hydraulic Consultants (indiscernible - distance from microphone).

MR. HILL: Graham Hill, Northwest Hydraulic Consultants.

MR. GILMOUR: I'm George Gilmour, a fish biologist from Meridian Environmental, representing the services.

MS. GLASS: Domoni Glass, Environ.

MR. HOLMQUIST: Chris Holmquist Johnson, USGS

MR. AUBLE: Greg Auble, USGS.

MS. HANSON: Leanne Hanson, USGS.

MS. JULIE ANDERSON: Julie Anderson, AEA.

MS. ROBINSON: Nikita Robinson, AEA.

MR. ANDERSON: Nate Anderson, Alaska Energy Authority.

DOUG OTT: Doug Ott, Alaska Energy Authority.

MR. GEIGER: I'm Hal Geiger of St. Hubert Research Institute.

MR. BOZEMAN: Marty Bozeman, AEA.

MR. HILGERT: Phil Hilgert, R2 Resource Consultants.

MR. BRNA: Phil Brna, U.S. Fish and Wildlife Service.

MS. LONG: Becky Long, Susitna River Coalition.

MS. EMILY ANDERSON: Emily Anderson, Wild Salmon Center.

MS. FISHER-GOAD: Sara Fisher-Goad, Alaska Energy Authority.

MS. DISCHNER: Molly Dischner, Alaska Journal of Commerce.

MR. MERZ: Joe Merz, Cramer Fish Sciences for (indiscernible - distance from microphone).

MR. RUGGERONE: Greg Ruggerone, NRC, working with the services.

MR. CLARK: John Clark, St. Hubert Research Group.

MS. O'NEIL: Sarah O'Neil, with Trout Unlimited

MR. BJORKQUIST: Brian Bjorkquist, Department of Law, State of Alaska.

MR. FULLERTON: Bill Fullerton, Tetra Tech, Geomorphology Study Lead.

MS. BLIZARD: Jessica Blizard, Tetra Tech.

MR. GIBBONS: Harry Gibbons with Tetra Tech.

UNIDENTIFIED SPEAKER: Chris (indiscernible - distance from

microphone).

MR. THERRIAULT: Gene Therriault, Alaska Energy Authority.

MR. PETERSON: Ryan Peterson, Independent Media.

MR. PADULA: Great, thank you, and for folks on the phone, could you -- we'll see how this goes. Could folks introduce themselves, just name and association, please?

MS. CURTIS: Jennifer Curtis, Environmental Protection Agency, the Alaska (indiscernible - interference with speaker-phone) office.

UNIDENTIFIED SPEAKER: (Indiscernible - interference with speaker-phone).

UNIDENTIFIED SPEAKER: (Indiscernible - interference with speaker-phone), National Park Service.

MS. DARA GLASS: Dara Glass from CIRI, and just so you guys know, we're having a difficult time hearing people on the phone. It keeps breaking up and people who talk softly, we are unable to hear.

MR. PADULA: Thank you. We'll do better.

UNIDENTIFIED SPEAKER: (Indiscernible - interference with speaker-



phone).

UNIDENTIFIED SPEAKER: (Indiscernible - interference with speaker-  
phone).

MR. PADULA: There was a couple of folks who overlapped there. Can we  
take them one at a time, please?

UNIDENTIFIED SPEAKER: (Indiscernible - interference with speaker-  
phone).

UNIDENTIFIED SPEAKER: I can't hear him.

UNIDENTIFIED SPEAKER: (Indiscernible - interference with speaker-  
phone).

UNIDENTIFIED SPEAKER: (Indiscernible - interference with speaker-  
phone).

MR. JENSON: Peter Jenson, LGL.

MR. SMITH: David Smith, LGL.

MR. PADULA: Thank you. Can you see our screen, those of you who are on  
Go To Meeting?

UNIDENTIFIED SPEAKER: Yeah (affirmative).

UNIDENTIFIED SPEAKER: Yeah (affirmative).

UNIDENTIFIED SPEAKER: (Indiscernible - interference with speaker-phone).

UNIDENTIFIED SPEAKER: (Indiscernible - interference with speaker-phone).

MR. PADULA: Yeah (affirmative), that's -- I think you'll just have -- it's probably better if you can just raise your hand vocally, and we'll recognize you.

UNIDENTIFIED SPEAKER: (Indiscernible - interference with speaker-phone).

UNIDENTIFIED SPEAKER: (Indiscernible - interference with speaker-phone).

MR. PADULA: Okay, is that everybody? Good, thank you, again, for joining us. Again, and I'm going to try to run through some slides very quickly here, so we can get to the meat of the meeting, just a very big overview here, in terms of where we are in the process.

You'll remember, actually, back in February, there was a draft ISR that was developed by AEA. Then in June, on June 3rd, the formal Initial Study Report was

filed with FERC on all of the studies with the progress on the study program through that point in time.

FERC amended the schedule to add some additional review time through October 1st, which brings us, essentially, to today and this first set of meetings. There were a number of supplemental technical memos. They were issued just last month. Again, FERC looked at that amount of information and sought it appropriate to, again, grant some additional review time.

They did that in their letter on October 3rd, and essentially, that sets up a second set of meetings, which will be held in January. So again, today, the focus really is on the ISRs and all the information that has been published to date. So again, we hope to engage with you on all of that.

The meetings in January are clearly intended to be supplemental, in that they will cover that information that has come out since the ISR and reflected in the technical memos.

So the new schedule, as it currently sits, based on FERC's last guidance letter, is that on January 22nd, is the target for AEA to file meeting summaries on both sets of meetings. So that will all come out at once, in January, and then again, the typical

30-day review time by February 21st, licensing participants have the opportunity to file comments on both the meeting summaries, as well as to make their recommendations, if they have any, for either modifying existing studies or recommending new studies.

There's a 30-day period in which folks can respond to any of those comments that are made on the record and to identify any disagreements, and then FERC has its own target of April 22nd for issuing a determination on the efforts to date and their recommendations, as to whether, again, existing study plans should be modified or whether any request for new studies should be entertained, and then after the complete next field season, you can see the markers that are out there for the updated study report and study report meeting, comparable to what we're doing today.

So I think we have ahead of ourselves, in terms of a general schedule...

MR. JAYJACK: Hey, Steve.

MR. PADULA: Yeah (affirmative).

MR. JAYJACK: Real quick on that schedule, so we didn't go through and account for, you know, try to identify weekend days on there, but there is, in the

actual issuance, there's a note on there that says that the due date falls on a weekend day, or if it falls on a non-business day, so we get, you know, work gets cancelled or the office closes for any particular reason, the due date rolls over to the next business day.

So Sue pointed out to me, that for instance, the -- is it February 21, falls on a Saturday, but actual -- the actual due date thus far will be the close of business on Monday, February 23rd, unless, for some reason, Monday's schedule rolls to the next business day. So again, we don't attempt to try to figure out, you know, what days we may or may not be closed on, but we put that note in the -- on the schedule and we follow it accordingly.

MR. PADULA: Thanks, and I appreciate that clarification. Again, just a quick detail, I know this information has been up on the website for a couple of weeks, so hopefully, you've had a chance to look at it. This is just our -- these six days' worth of meetings, three days this week, three next week, and in terms of the topics that are reflected in the detailed agendas, what we hope to cover. Those are just some notes from -- for folks who may have read this online.

MS. LONG: I have a question.

MR. PADULA: Yes, Becky.

MS. LONG: Unexpectedly -- my concern is, can FERC clarify -- will AEA be able to go ahead with the second year of studies before your determination in April?

MR. JAYJACK: Well, they -- I mean, AEA can -- so they can gather information to the extent they want to. As far as whether, you know, what information is second year studies, that's to be determined through the directive modification decision in April as to, you know, what we call it, but at any time, I mean, they can go out and study right now, if they wanted to put that information into the record.

As to whether or not we would consider it to be second year studies, well, that's left to that April determination, as to, you know, what officially is the second year of ILP studies.

MS. LONG: Thank you.

MR. PADULA: Thanks for the question, Becky. Again, just a little bit of roadmap on the big documents that have been out there for a while. Again, you may recall, the draft ISRs were February, and then we filed the final ISRs in June, and those ISRs had three major parts to them. Part A was essentially, again, just refileing

the draft technical information, and we had made a commitment to folks not to modify that information and make it any harder for folks to follow that. So Part A stayed the same.

Part B presented any new supplemental information or if there was some errata with respect to the February filing, and then Part C was new information that had not been included in the draft ISR. So again, anybody who's been looking at those documents, that should look familiar to you, in terms of how information was organized.

In terms of today, our approach for today, we definitely want to encourage discussion and interaction. So we are going to keep technical presentations short. On average, we're looking at no more than about 10 minutes, particularly on today's studies. We may go a little longer. We may give Bill Fullerton a little bit more time in his presentations, but again, trying to just do very much of an overview on the assumption that folks have had time to review the information.

So our presenters, generally, are going to follow this format, a brief overview of objectives, components, and methods with references to the ISR, if we need to go there and look at any detailed information, trying to be clear about any variances

that occurred during the study through the ISR filing. So if something changed and it did not go exactly according to the approved study plan, we have flagged those for folks, both in the documents and we'll summarize those today.

We're going to summarize results, and if AEA is proposing any modifications of its own, as it looks ahead, to continuing studies, we will summarize those today, too. A few of the ISRs actually had decision points embedded within the plan. So if that's relevant, that will also get covered today, and then the -- the next steps, if you will, to the extent AEA has already laid out what it feels are the steps to complete a study, that gets covered, and then again, we hope to do that very quickly.

We can reference documents, if need be, and then we want to open it up, again, to discussion, and again, hear from folks as to how they feel progress is to date and whether there is some discussion you want to have about potential modifications to the study plan going forward.

These last three slides were online, and I'm not going to go through them again. It's basically the regulations and they're also up on the wall for anybody, during a break, who -- it's the same thing on both sides here. It's essentially the regulatory language about what the requirements are for someone who actually



wants to file a comment with FERC about either the need for a new study or a necessary, from their perspective, modification to the study plan. It's laid out there. It's in the regulations. We just wanted to make sure it was available to folks.

So anybody have any basic questions about how the day will go today and what our focus is? Great. Wayne, I think you wanted to make some remarks before we go to the first presentation.

MR. DYOK: Yes, thanks, Steve. Welcome, everyone, my name is Wayne Dyok, with Alaska Energy Authority, and I just have a couple of open remarks here, but I want to make sure folks on the phone can hear me. Dara, can you hear me clearly?

MS. DARA GLASS: I can, Wayne, thank you.

MR. DYOK: Okay, great. So I want to take a real high level here, because not everybody is maybe as familiar with what we're trying to accomplish as maybe others, so what are our goals for these studies? There's really two major goals. The first one is, we need to collect information for the Commission, so that they can do their environmental analysis.

The second need for these studies is to be able to assess project effects so we

can develop appropriate protection, mitigation, and enhancement measures. So most of you probably are aware that we spent, essentially, all of 2012 in a collaborative effort to come up with the right studies, and you know, those studies are a robust, you know, set of studies, and you know, FERC had, you know, come out with their study plan determination in April, I guess, February and April of 2013. So we have a good set of studies to work with.

We also collected some data in 2012. So in 2013, we did our first year of studies per the FERC study plan determination, and then as Steven mentioned, we filed that Initial Study Report that pulls all that information from our first study year, plus information from 2012, and as appropriate, information from the 1980s. As you all know, there was a lot of information collected in the 1980s.

Based on that information, we proposed some study plan modifications in our Initial Study Report. We also mentioned, in that Initial Study Report, that we were going to be providing additional information in 2014.

So we all should keep in mind, too, that we didn't have full access to Alaska Native, you know, lands in 2013. So we used this year, 2014, to fill in some of those, you know, some of those, you know, data gaps, and based on that information

and continued work that we did, we filed, you know, technical, you know, memos, you know, with the Federal Energy Regulatory Commission.

We are, in these brief presentations, going to touch lightly upon, you know, those 2014, you know, field efforts, to the extent that they affect the, you know, project, you know, modifications. As we also had pointed out, we're going to have an opportunity for full discussion of, you know, those technical memoranda in January of 2015. We will get out a schedule of those meetings after we have these meetings this week and next week.

So what I'd like to do is I'd like to encourage all of us to work together over the next, you know, two weeks. Let's make sure we understand the data, understand what it means and how we're going to be, most importantly, how we're going to be using this information in decision-making, and then, really work together to identify what study plan, you know, modifications we should have going forward.

AEA is going to produce, you know, in the next couple of weeks, the information that it thinks is appropriate, but I think with the input of all participants here, we can have a more, you know, robust, you know, set of study plan, you know, modifications that we put forth, you know, to FERC. So I would encourage us,

again, all of us to work together collaboratively over the next couple of weeks.

MR. PADULA: Thanks, Wayne. Yes.

MR. JAYJACK: The only thing I would add, I agree with what Wayne is saying, but because we're integrating multiple agency responsibilities, I would say our goal here, it's not only to get the information that we're going to need for our NEPA process, but it's information the agencies are going to need, as well, for their responsibilities and their processes, as well, which was the intent of the ILP and why it was designed.

MR. PADULA: Thanks. (Indiscernible - distance from microphone). Okay, we're going to go to...

MS. DARA GLASS: Hey, guys, this is Dara, again.

MR. PADULA: Hi, Dara.

MS. DARA GLASS: We can't hear anything that was said after Wayne stopped speaking. Whoever the next person was, I heard nothing. I knew somebody was speaking, but I didn't hear it.

MR. PADULA: All right, we're going -- we're going to make folks take the microphones -- in front of them before they make any other comments. That was

Nick Jayjack that you didn't...

MS. DARA GLASS: Okay.

MR. PADULA: ...quite hear, and he was just reinforcing what Wayne had said and adding, that you know, we need to collect information that each of the agencies also need for their own purposes.

MS. DARA GLASS: Okay, thank you, and Nick is one of them that we absolutely need to hear, so sorry, Nick. Thank you.

MR. PADULA: We just taped a microphone to Nick.

MS. KEEFE: Ready?

MR. PADULA: Yes. So Marylou's going to get us started with the first set of technical presentations. Again, if I could ask -- we think we can probably make it through the day if we can let the presenter get through the 10 minutes or thereabouts, wait to ask questions, just until they get through, take some notes, and then we'll open it up to a good, long discussion.

MS. LANCE: Sorry, I have quick comment to Wayne.

MR. PADULA: Identify yourself, please.

MS. LANCE: Ellen Lance, Fish and Wildlife Service, just wanted to

comment on being able to provide meaningful comments in the next couple of weeks following this meeting on the supplemental information that was filed in September.

This -- I believe the services are going to need more time to understand the 1,871 pages that were filed in September, and perhaps in the next two weeks, we won't be ready to do that.

MR. DYOK: Understood.

MS. LANCE: Okay, thank you.

MR. SHEPHERD: This is Alan Shepherd. We still can't hear anything on the phone and is there -- are there more mics in the room or something that you could (indiscernible - interference with speaker-phone) or you could look to or (indiscernible - interference with speaker-phone).

UNIDENTIFIED SPEAKER: Is there wi-fi in here?

UNIDENTIFIED SPEAKER: (Indiscernible - distance from microphone)  
than do without their discussion.

MR. PADULA: Yes, we're now getting all of the microphones turned on. That comment was from Fish and Wildlife Service and it was just, again, indicating

that with the amount of information that's been recently filed, it will be a challenge for Fish and Wildlife Service to really be responsive in the next couple of weeks.

They see themselves needing time beyond that. Is that fair? Okay.

All right, Mary, you're -- Sue.

MS. WALKER: I'd like to ask a clarifying...

MR. PADULA: Sue Walker.

MS. WALKER: I'm Sue Walker with a clarifying...

MR. PADULA: You need a microphone.

MS. WALKER: I'd like to ask AEA a clarifying question about the materials that we're being asked to review. We were told in a recent meeting that there will be additional materials provided by the end of November. We would not receive anything new after November 30th. So is that still the case, because that's different from what we heard just now.

MR. PADULA: Wayne, maybe somebody -- so could you repeat, because Wayne was in a sidebar there.

MS. WALKER: Sure. Wayne, at our last meeting, you indicated that there will be additional materials prepared for agency and other stakeholders' review, but

that the cutoff date for new information would be November 30th. Is that still the case or is the information that we have now, all that we will receive?

MR. DYOK: So this is Wayne again here. So the question is, are we going to be providing additional information, and if so, will it be provided by November, the 15th? The answer is, if there is additional information, it will be provided by November, the 15th. We're going to see how these meetings go, Sue, and at the end of these, you know, meetings, we should look at if there's a need for providing additional information to address, you know, questions and concerns that have been raised, but all the information will be provided by the middle of November.

MS. WALKER: Okay, so the date's changed from November 30th to November 15th?

MR. DYOK: I believe the date that we talked about was the middle of November.

MR. PADULA: Becky, Ms. Long.

MS. LONG: I don't really understand what this additional information is. We have 40 technical memoranda and there's even more?

MR. PADULA: If there's any way, can you answer Becky's question?



MR. DYOK: Yeah (affirmative). So you know, Becky, the question is, is there additional relevant information that may pertain to study plan modifications? We haven't stopped work on this project. Okay. We're continuing to review the information.

If there is anything that is of value to folks for decision-making for study plan modifications, that information, you know, would be provided. At this point, you know, we don't have any specific information in mind to be provided.

MR. PADULA: Again, I appreciate there may be kind of these broader questions and it's good to get some of them out here to start. Again, if there are specific questions you may have come up with during the course of today, that you either want to have a conversation with AEA staff about or FERC staff, they will make themselves available during breaks and lunch.

I really, as a facilitator, I see us running late already and I'd really like to launch into the technical presentations. Again, I'm not trying to cut off conversation, but anything that's really not focused on the 13 studies that we need to get through today, I'd appreciate it if you folks could open an opportunity to have that conversation offline. I appreciate that.

MS. DARA GLASS: Another comment on the microphone situation, the turning on all the mics (indiscernible - interference with speaker-phone), now there's sort of an echo chamber effect when people are talking and then -- so when the audience is talking, it's almost impossible to make out what they're saying and I think if you speak very clearly, but (indiscernible - interference with speaker-phone) picked up by multiple mics, there's an echo.

MR. PADULA: Okay, I appreciate the feedback (indiscernible - distance from microphone). We'll try and get this worked out. I think what we'll do now is we'll keep the mics turned off until someone needs to respond and then we will, hopefully, get in the habit of turning them on and off over the course of the day. So thanks, please keep giving us that feedback.

**THE FUTURE WATANA RESERVOIR FISH COMMUNITY AND RISK OF ENTRAINMENT STUDY (STUDY 9.10), AQUATIC RESOURCES STUDY WITHIN THE ACCESS ALIGNMENT, TRANSMISSION ALIGNMENT, AND CONSTRUCTION AREA (STUDY 9.13), ANALYSIS OF FISH HARVEST IN AND DOWNSTREAM OF THE SUSITNA-WATANA HYDROELECTRIC PROJECT AREA (STUDY 9.15)**

MS. KEEFE: Okay, Dara, I'm going to start and the first question is for you, can you hear me? That's a no.

UNIDENTIFIED SPEAKER: (Indiscernible - distance from microphone) you use a mic.

MS. KEEFE: Nobody on the phone can hear me?

UNIDENTIFIED SPEAKER: Yeah (affirmative), we can hear.

MS. KEEFE: Okay, all right, can you still hear me? Can you hear me now?

MS. DARA GLASS: You're starting to echo a little bit.

MS. KEEFE: Okay, well, I'll try not to echo.

MR. PADULA: She really needs you to use a microphone, too.

MS. KEEFE: Can I use the stand-up mic?

UNIDENTIFIED SPEAKER: Turn it on.

MS. KEEFE: Is it on?

UNIDENTIFIED SPEAKER: It's off.

UNIDENTIFIED SPEAKER: No, it's on the back. Push the button.

UNIDENTIFIED SPEAKER: The little button.

MS. KEEFE: Okay, how's this? Is this better on the phone? Apparently not.

UNIDENTIFIED SPEAKER: (Indiscernible - interference with speaker-phone).

MS. KEEFE: Okay, I'm going to take that as a yes. So we're going to start with three studies that were delayed in 2014. So they'll -- they should go -- or 2013, so they should go pretty quickly. The first of these studies is Study 9.10. It is -- I have to set the presentation up. Sorry about that.

The Future Watana Reservoir Fish Community and Risk of Entrainment, there are four study objectives for this study and basically, the are -- three of them are to develop future scenarios for what the reservoir might look like and what the fish assemblage in the reservoir will look like, and then the fourth objective is to conduct a qualitative assessment of entrainment risk at the proposed dam, and this will be a desktop analysis based on existing information at other hydro projects, and the proposed configuration for the dam at Watana.

The study components of this study mimic the study objectives. The variance, as I mentioned, was that this study was delayed. AEA is not feeling that this is a very significant delay because this is a desktop study that will take much less than one year to complete. So we feel comfortable that we'll be able to meet the study

objectives in the time remaining, and we have all four steps left to complete this study in 2015.

Any questions, feedback on this future reservoir study? Great, I love this. Okay, and Justin's going to run up and help me, since it's his computer.

We're going to go on to Study 9.13, which is the Aquatic Resources Within the Access Alignment, the Transmission Alignment, and the Construction Area. So there are two simple objectives for this study. The first is to characterize the aquatic habitats and the fish assemblages at potential stream crossings.

So where the alignments would cross a stream, we want to get in there. We want to survey within a 200-meter-wide section and we want to understand the aquatic habitat and assemblage. In addition, this study covers any construction area from the dam, itself, or related facilities.

The two components, synthesis of existing information, that's been started a little bit. You can find some in the ISR, and then a field data collection component that has been delayed, and the delay of this field data collection is a variance, as described in Section 4 of the ISR, for 9.13.

We weren't able to start this study in the first year. We will be able to start it

in 2015, and we're adjusting the schedule a little bit. We want to make sure we get out early in the season, as soon as we can after breakup, and survey all the sites, and then if there's any potential concerns, any issues, and we have to go back to a site, we'll have time in the September timeframe to go back and do any resampling that we may need to do.

Another -- I guess a result since the ISR of this study, is that AEA is -- sorry, this is a surprise slide. So these are the three corridors that are summarized in -- this is the existing information that's summarized in the ISR. It talks about the number of stream crossings, the potential of the fish, based on the existing information. That's all summarized in the ISR for 9.13, Section 5.

The proposed modification for this study is that AEA is now trying to move away from the Chulitna Corridor. There's a couple of issues with that corridor. One is it crosses Portage Creek and Indian Creek streams, and they'd like to minimize impacts to those streams, if they could, and another is that there's some high elevation crossings, which also are high risk, and so they'd like to move away from that corridor and they're proposing to eliminate that corridor, and I already talked about the two sampling events within the next year.

So steps to complete this study are everything that we have to do, everything that's been described in that list, and I understand there might be a comment about this access alignment study, so Becky.

MR. PADULA: Becky.

MS. LONG: Okay, here's a copy of my comments for AEA, and a copy for FERC. Well, I am just concerned that all of this stuff can be done in one year. You've got incomplete field surveys. You've got a preliminary synthesis of the data that means that the majority of the tasks, RSP goals, will occur during the second year of study, which means the comprehensive fish distribution and (indiscernible - voice lowered) habitat dataset.

I'm just concerned, is this realistic. The Denali West Gold Creek Corridors have a total of 23 proposed stream -- stream, I'm sorry, I'm nervous, stream crossings that have no historical data. They are classified as unknown.

We don't know that if the Chulitna Corridor is officially dropped. The stakeholders have yet to be consulted on that. The Chulitna Corridor has 17 sites that have never been surveyed. The new Denali East Corridor has not been surveyed, the stream crossings. There is no preliminary synthesis of potential

crossing and aquatic resources.

The four major study objectives must be met, a complete synthesis of the existing data, a complete field data collection that may be need two collection season for fish escapement and applying habitat surveys and data analysis and recording.

I'm just concerned that the goal of the least environmentally damaging access and line out, can this be accomplished, and on the project infrastructure outside of the corridors, it is understood that the specific location of the airports and construction camps are not established yet, that there is a distinct lack of detailed maps about this infrastructure areas that's lacking in the ISR.

For instance, Part A, Figure 3.1, shows a red solid area that represents dam and camp facility or (indiscernible - voice lowered) larger study area. There needs to be a close-up map of this corridor with the airport locations. You have that particulars -- you have that for the corridors in Figures 5.1 through 5.3. We need more specific maps for that infrastructure corridor.

Preliminary synthesis of these areas have apparently not been done. Perhaps there is no existing information. Specific study methodology to gather this



information in the field is absent. If you look on the USGS maps, within three miles north of the dam site, in Section 14 through 16, Sections 21 and 22, of the T23 North Arc and East, they have a lot of wetlands in there. The USGS map shows numerous wetlands.

This information is presumably necessarily to apply for US Army for 414 permits. It entitles us to habitat permits. As a licensee participant, I would like to receive a detailed map of the new Denali East Access route (indiscernible - voice lowered). That's it.

MR. PADULA: Thanks, Becky. I think -- I appreciate the details in your comments. I think the first part really dealt with the question of the ability to get the work done in a single season, versus two, and then I think the second one dealt more with the level of work done, maybe with regard to existing information, planning for getting out and doing work on the new report. Can you take care of that?

MS. KEEFE: Yeah (affirmative), I can take the study schedule, implementation schedule question for you. So a total, even if you include the 17 sites from the Chulitna Corridor, is 40 sites. We would anticipate that we would be able to knock off an average of two sites a day with a team of three out there doing

the surveys. So that team would have about 20 working days in the field to conduct that initial survey.

That said, I think there's plenty of time if we get out there in July to get out there and complete that survey and ample time, then, for us to look at the data that's collected and go back in September, if we need to do any cleanup or anything that was missed, resurvey anything that was missed. I don't know if AEA or...

MR. PADULA: Yeah (affirmative), and I guess at the tail end, Becky, I think you had a request there to get a detailed map of the new corridor?

MS. LONG: Yes, I would appreciate that.

MR. PADULA: Is that, I'll ask, is that available somewhere yet, AEA, or if we can make that available?

MS. MACGREGOR: Yes, it was filed in the overview of the ISR.

MS. LONG: It's very general.

MS. MACGREGOR: Okay, okay.

MR. DAVIS: Steve, I have a question on this study, as well.

MR. PADULA: Yes, Jeff, and identify yourself, if you would.

MR. DAVIS: Jeff Davis from ARRI. Marylou, is there an associated water

quality study with this project to look at turbidity, hydrocarbons, heavy metals that may be associated with road runoff to get background concentrations?

MS. KEEFE: That would not be a question for me, unfortunately, but Harry is in the audience and he may know if there's a corresponding water quality study for the border of construction areas.

MR. GIBBONS: Not at this time.

MR. DAVIS: Is the road construction proposed to be -- the road -- the stream crossing structures, are they proposed to be temporary crossing structures for construction or are these long-term permit crossing structures, that is culverts that pass fish or a culvert that may have to withstand a 100-year flow event, or has that been discussed at all yet?

MS. KEEFE: That one's an AEA question.

MR. DYOK: Probably people can hear me, this is Wayne Dyok, Alaska Energy Authority. You know, Jeff, we're looking at bridges that would not require culverts for the high level crossings. There may be some minor stream crossing, that you know, would be culverted, but that's to be determined through the studies. So we'll work hand-in-hand with the engineering as things go, you know, move

forward.

MR. DAVIS: Thank you.

MR. PADULA: Does anybody else have any comments on this particular study?

MR. DAVIS: I guess I would suggest a study modification, because that's the point here, to implement a water quality study to address background water quality conditions at those stream crossings, since there is a potential to introduce fine sediments, heavy metals, hydrocarbons, from construction-related activities and traffic post-project.

MR. PADULA: Thanks, Jeff, that's (indiscernible - distance from microphone).

MS. THOMAS: We can't hear what whoever is talking is saying.

MR. PADULA: We'll get him a microphone, unless you can restate it.

MS. KEEFE: The request from Jeff of ARRI was that -- for a modification to incorporate water quality in this particular study. Is that sufficient?

MR. DAVIS: Yes, that's the general...

MS. KEEFE: Details to follow. Okay, we're going to move onto the Fish

Distribution and Abundance Studies now.

MS. MACGREGOR: You didn't do 9.15.

MS. KEEFE: I didn't do 9.15, sorry. I'm having a hard time running this computer, apparently. It's brutal when you change operating systems and have to go backwards.

Okay, Study 9.15 is the Analysis of Fish Harvest in and Downstream of the Susitna-Watana Hydroelectric Project. Again, this study has been delayed, and again, this is more of a desktop analysis. There are two objectives to -- the first is to describe the baseline level of harvest and the harvest locations for folks in commercial sport, personal, and subsistence use fisheries for Susitna origin fish. The second is to describe the potential for the project to operate, sorry, to affect harvest levels and opportunities in the river basin.

The study components, there are five of them. The first four are all similar. It's to compile the existing information from Alaska Department of Fish and Game on harvest levels and where people harvest, and the fifth is the evaluation of the project effects.

This study was not implemented, as I said, in 2013. It was delayed. That's a

variance noted in ISR, and it will be implemented in full in the next year of study.

Any questions or -- from the harvest?

MR. DAVIS: Jeff Davis from ARRI, again, do you have a feeling or have you done any analysis to see the accuracy and the scale of those harvest data from Fish and Game? Having turned in those harvest tickets myself a number of times, I'm wondering if the scale is appropriate for the study. That is, I don't remember it being like Middle River specific or tributary specific.

MS. KEEFE: You know, I did not pull this study together myself. This is one that was pulled together by two ex-ADFG employees that were on the contract team and I believe they were familiar with the data that was available when they (indiscernible - voice lowered) that. So my expectation is...

MS. THOMAS: (Indiscernible - speaking simultaneously) we couldn't hear -- we couldn't hear that question either, and we can barely hear the answer, sorry.

MS. KEEFE: That's all right.

MR. PADULA: Yes, Cassie, we'll restate the question and answer.

MS. KEEFE: Go ahead, Jeff, you go first.

MR. DAVIS: Well, this question came up, so I remember it was discussed at

the TWG meetings and I never heard a response then, and that was whether the data from the Fish and Game surveys was adequate to meet this objective for two reasons, 1) because of data quality, and 2) because of the scale of the surveys that Fish and Game puts out relative to the scale of potential impacts of the project?

MS. KEEFE: Yeah (affirmative), and the answer is that I didn't do this study, personally, myself, but that I am confident that the folks that did it, were knowledgeable of the scale of the data that was -- is collected and thought it was appropriate. It's the available, existing information that we have to work with for this study and they were fairly confident, both being ex-ADFG folks, that we would be able to do an adequate study with the existing data.

MR. PADULA: Any other comments, and again, we put these bullets up here just to remind ourselves that we want to hear from everybody, not in any particular order, but agency folks, any other comments there or from the [CIRWG] or again, members of the public or any of the organizations representing public interests? We want to make sure give everybody an opportunity here today. Okay.

**STUDY OF FISH DISTRIBUTION AND ABUNDANCE IN THE UPPER  
SUSITNA RIVER (STUDY 9.5)**

MS. KEEFE: Okay, now we're going to move onto the Fish Distribution and Abundance Studies. Nine-five is going to be our first study, which is the Study of Fish Distribution and Abundance in the Upper River. There are eight different study objectives for this study. They largely are all related and the goal is to characterize the seasonal distribution, relative abundance, and the habitat use of resident fishes and juvenile anadromous fishes in the Upper River.

We do that in a number of different ways, with different methods. We also, in this study, collect tissue samples and information to support other studies. The study components for this study mirror the study objectives. There were several variances that occurred during the implementation of the first year of 9.6. They are listed in Section 4 of the ISR.

The variances in this study pertained largely to permit restrictions, land access limitations, and field constraints. The variances are also presented in the ISR in Section 4, and a couple of the variances in the Upper River led to modifications that AEA has proposed, that is a reduction in the sample unit length and actual trap locations, and I'm going to talk about those modifications in a little bit.

This is a very, very high level overview of the data that was collected. There's



lots of tables and sections in the ISR for you to get more information. We observed about 12,700 fish, covered nine species in the Upper River. The majority of those were caught during the open water period with the FDA broadcast sampling.

Four hundred fifty-eight fish were caught during the early life history sampling that happened in June. Six fish -- six of those 458 were Chinook that were taken from the Black River. The screw traps worked pretty well in the Upper River. We captured over 1,100 fish in the rotary screw caps, including a dozen Chinook salmon. Eleven of those 12 Chinook salmon were from the Oshetna trap.

Twelve thousand fish were over 60 millimeters, were PIT tagged and we had 42 fish that were resighted either by arrays or collected by crews. We had 92 fish that were radio tagged in 2013, covering four species, and we collected information for other studies.

This is a map of all of the sample sites that were completed in 2013. The black dots represent the sample sites, and the red dots depict where Chinook salmon were found. As you can see from the insert over there, Kosina Creek was where we found the majority of the juvenile Chinook salmon, but there were some, a good number of them in Black River, as well.

Okay, proposed modifications, several proposed modifications for this study base that came up after we reviewed the 2013 data, and we talked about the limitations of data collection. The ones that I really want to focus on are the reduced number of mainstem transects. We're proposing to cut the number of mainstem transects from 20 to 10, and to offset that by increasing sampling in rarer, I don't want to call it rare, but their more rare off-channel habitats in the Upper River.

We weren't able to do this in 2013, because the data that supporting applying the GRTS approach in the Upper River wasn't available -- in 2013, wasn't available to us when we were planning. That data is now available and we are able to use the GRTS approach to get at more at these rarer habitat types.

The other proposed modification is the increased length, total length of sampling in the tributaries, and yet, we want to maintain the modification of a reduced sample length.

So here's an example, and I don't have a pointer, but that's okay. Here's an example of a proposed modification and a result in 2014, because we went out and tested these -- how we were going to be able to accomplish these modifications in 2014. We had the opportunity to do a test run.

So if you look over on the left side of this slide, you'll see a red transect and two dots. That's the -- what was surveyed in 2013. That transect and that main blue dot is a main channel site and the green dot is a side slough. That was the 2013 sample, transect sample.

In 2014, we applied the approach of reducing the transects and using the GRTS analysis. We went out. We sampled the transect and associated habitats with that, but the GRTS sample also picked up these six yellow upland slough sites and this one blue side channel site. So this is an example in this reach where by applying this new approach for 2014, we were able to increase our surveying of off-channel habitats. This next...

MR. DAVIS: Can I ask you a question at this point?

MS. KEEFE: I think it would be best if we could hold the questions to the end.

MR. DAVIS: Okay, sure.

MS. KEEFE: Thanks. This next table is about the tributary sampling. This table comes from Section 7 of the ISR, and basically, it proposes changes to the total length of the tributaries to be sampled in the Upper River. So what we tested in

2014, was how this would work in the Black River. We were only able to get out and try it in one river and we were very effective.

In the Black River, we increased our sampling length by 2,500 meters and we increased the number of mesohabitats that we encountered, mesohabitat units that we encountered from 11 to 28. So we feel like these approaches are supporting the modification of -- and getting us out into those more rare off-channel habitats.

Another modification I want to talk about is the change up in the downstream migrant trapping in the Upper River. We talked about this in the [TWG] in March, and it's proposed in the ISR. What we'd like to do is we'd like to replace them migrant trapping at Kosina Creek with fyke nets and we have found a location for the migrant trap in the mainstem at approximately river mile 200.

What we did in 2014, was we implemented these techniques and then we took the six weeks' of data, the first six weeks' of data, and we analyzed that. The reason we took the first six weeks' of data was we had this meeting coming up and we wanted to compare that with data from last year.

So we compared that for Kosina Creek with the first six weeks of screw trapping in Kosina, and that comparison shows that the fyke net, indeed, is more

efficient at a fish per night rate, as well as caught Chinook salmon out migrating, where last year, we didn't catch any with our screw trap in Kosina, and in addition, we have a rotary trap here at PRM 200.

That rate of 9.76 fish a night is the best rate we've seen in a trap in the Upper River, and we were able to collect 12 Chinook salmon migrating downstream in that (indiscernible - voice lowered).

We also have some updated information on radio tags. This is in the Winter Studies TM that was filed in September, and we tagged fish in 2014, making progress toward our species targets of up to 30 tags per species. We basically saw some overwintering of fish. The most interesting finding was that grayling and round white fish moved past the dam site, some of them, for overwintering, and this table here that you have in front of you, is what we call the tags at large analysis.

It gives you the number of active tags out there by month, by species, and as you can see, if you look at the July column, we started tagging in 2014, and we increased our numbers of active tags for five of the species through this open water period.

We have one new modification since the ISR that I'm going to bring up today.

When we got the information on how successful we were with that trap at river mile 200 and the fykes in Kosina Creek, we said, "Okay, what's a better use of our efforts?" We have two years of trapping in Oshetna and Kosina. So we don't really have to go back there, if we -- but we really think that the effort was better expended at a third year of trapping in Oshetna and Kosina, and not doing the early life history that we initiated in 2013.

It was two visits and it gives you information on fish in certain habitats at a certain time, but it doesn't give you the timing component of fish moving out of these systems, which I think is more beneficial for other studies.

The current status for 9.5 is as proposed. We will be repeating everything, all the study components, and the next year of study will be -- exception of the early life history. Steps to complete the study are to repeat what was done in 2013, based on the study plan, the methods as described in the study plan with the modifications that are described in the ISR, so fish distribution and abundance sampling, rotary screw traps, and fyke nets, radio telemetry, and PIT tagging, tissue collection, and I guess that's it. I'm ready for any comments.

MR. PADULA: Jeff, do you want to start us off? You've got the mic in front

of you.

MR. DAVIS: Sure. You talked about a modification to go back to selecting macrohabitats using the GRTS methods for the mainstem area. Was that six for geomorphic reach or six total for the Upper River for macrohabitat type?

MS. KEEFE: We talked about -- you can answer the question. I don't have to answer them all.

MR. PADULA: And identify yourself.

MS. STEIMLE: This is Kai with R2. The proposal was to do the six for the entire river segment. The difference in the stratification by geomorphic reach was that the impacts in the Middle River are assumed to vary by geomorphic reach, but in the Upper River, we're talking about the inundated reach, so it doesn't have that same relevance for impact assessment in the Upper River as it does in the Middle River. So we proposed to pool the reaches for sampling.

MS. KEEFE: So it's six of each mesohabitat type, macrohabitat type.

MR. DAVIS: So six of each macrohabitat plus 10 transects, is what you're talking now?

MS. KEEFE: Plus -- yes, and all of the associated habitats with those

transects that were conducted in 2013. Remember, in 2013, we did do the transect, but we also had people looking around for a tributary mouth or a side...

MR. DAVIS: Whether it was cross or in close proximity?

MS. KEEFE: In close proximity, correct.

MS. STEIMLE: Sorry, I think the Section 7 describes the proposal for the modification in the ISR, and then there's more detail in the technical memo from September.

MR. PADULA: Anything else? Do I see anything from Fish and Wildlife Service or questions on this particular issue?

MR. HAUGHT: I've got a question.

UNIDENTIFIED SPEAKER: Stormy Haught.

MR. PADULA: Sure.

MR. HAUGHT: Stormy Haught, Fish and Game.

UNIDENTIFIED SPEAKER: Here.

MR. PADULA: Take a mic, please.

MR. HAUGHT: Just looking through the ISR, you know, it looks like we're seeing pretty high tag mortality with the upriver resident tagging, anywhere from 2%



to 40%, and I guess what I'm thinking is, do we need to increase the size, you know, the sample size, put out a little more tags? What I would like to know from you is if in 2014, did you guys see similar rates of tag mortality (indiscernible - distance from microphone)?

MS. KEEFE: And we have our resident tagging expert over here to address that question. Bryan, introduce yourself.

MR. NASS: Hi, Stormy. Bryan Nass, LGL. The question was regarding mortality rates and the answer is, yes, we've adapted based on the initial study that was conducted in 2013, to the extent that we decided, based on looking at the data, that survivorship was higher when we were tagging fish in the, let's say, early May to June period, and the September period, and we found that those fish tagged, let's say, during July and August, did not survive as well.

So when you're looking at these tables, there's a lot of overlap, because we're basically pooling all of these tags. So it's kind of tough to tease out exactly where the mortality is looking -- is happening. However, we looked at individuals, by group, and in that kind of situation, and that's why in 2014, when we out to apply tags, as per the ISR, we're pretty sure, we decided that we were only going to tag

during that June and September period, and so at this point, we did that in 2014.

We are tracking those fish right now, and hopefully, we'll have some new information that will suggest that tag survival, fish survival is higher than what we saw previously. Does that answer your question?

MR. HAUGHT: Yes, thanks.

MR. NASS: Thank you.

MR. PADULA: Thanks, Bryan. (Indiscernible - distance from microphone)  
microphone, please.

MR. GEIGER: Yeah (affirmative), I'm Hal Geiger. I'm with St. Hubert Research Group. When we went through and we were trying to look carefully at the CPUE-based estimates, one of the things we got very concerned about is that -- is they pass through with different gears, that those gears -- the sampling may have interacted.

For example, if they went through and snorkeled, that would scare fish out of the area and so then seining, for example, would be affected. So we're, first of all, we were concerned about the gears interacting and we couldn't figure that out from the texts. So maybe you could comment on that.

The other thing that we couldn't find, were any estimates of precision and sampling error, and when we did go through and just look a little bit, we would have thought that the different sampling gears would produce -- CPUE estimates would be highly correlated if they were really fundamentally getting at the abundance and in some of the -- some of our examination, we didn't find much correspondence. So I wonder if you could comment on those two points?

MS. KEEFE: I can comment on -- I can comment on the -- for sure, I can comment on the approach and the use of multiple methods, and you know, it's a very complex system. Every habitat is different and we know that all the gear that we're using is biased.

We know traps are biased to small fish. They perform better in slow water. Electro fishing is a really effective tool. We'd love to use. We'd love to use it everywhere we can, can't use it if there's adult [salmonids] around and we can't use it in a turbid stream.

So we came up with an approach that would allow us to use multiple methods so we could document the presence and distribution of all of the life stages and all of the species present in each of these different habitat types, and that approach and --

included a protocol, which is in the implementation plan, which is part of the study plan, that asked people to, in fact, snorkel first, and then follow up with one of the other methods, and there's an actual structured order that we asked the crews to follow.

So is there potential for fish to -- for interaction between those? Absolutely. If you've got a better way to do it, I'm happy to have a discussion and talk about that. I think there are down sides to it. If I could apply one method across all these habitats, and feel comfortable that it was sampling effectively, all species, all life stages, of fish in that habitat, I would love to hear it, if you have that, so -- and we can have that discussion. I'm absolutely happy to have it.

MR. GEIGER: How about the issue of sampling error? We couldn't find any estimates on sampling error.

MS. KEEFE: We, you know, we were taking the ISR as a check-in point, as a progress. We were at QC3 level for our data sets, and this was a very quick process. We were out of the field in October, the end of October, and we were producing reports in December, and that means a lot of data management in between.

So we did not do any kinds of error estimates on the CPUE. It's possible. It's

absolutely possible. We have multiple methods. As far as the autocorrelation, I have to have Alice talk to you about that. You need a microphone, Alice, and you need to introduce yourself, please.

MS. SHELLY: Maybe you could reiterate the question about correlation?

MR. GEIGER: Well, we would think that if these different methods, imperfect as they are, are getting at a fundamental abundance, each one slightly differently, that they -- in the same sites, they'd be highly correlated, the -- say the minnow trapping in the gears, but we didn't see, in at least some of the cases, we didn't see much correspondence at all, but then that was also tying into the issue of sampling error. So those are kind of intertwined, really.

MS. SHELLY: Yeah (affirmative). Yeah (affirmative), okay, this is Alice Shelly, R2. We haven't provided any estimates of sampling error in the ISR, and we will be trying to get that issue in the USR and further on.

As far as the correlations are concerned, I think that the different sampling gears are intended to capture different species in different habitats. Correlations, maybe, that would be nice, if they all sort of caught the same things. I'm not really that surprised if they're not correlated. I haven't looked at that myself, because --

and that's the reason we're using all those different sampling gears and all those different places, is trying to get -- make sure we see all the fish that are actually there. It's more of a distribution approach.

MR. GEIGER: I just have one last question. So I think there was sub-sampling within sampling units of -- sampling where there was mesohabitats were gone to without -- well, I guess my question really is, are you confident that you can go back and really expand? Do you have the information you have -- to really make expansions, if it comes to that, in terms of how the -- where the individual samples were collected? Was all the information there, if it's necessary to go back and figure out the probability of selecting each individual sampling unit?

MS. SHELLY: Yes, to the second part. I'm not sure what you mean about expansion. So in terms of the probability of units being selected, I think we have a pretty good handle on that. I'm not sure what you mean by expansion.

MR. GEIGER: Okay, all right, well, I guess that -- I'll just take that for the time being.

MR. HAUGHT: I just have a quick follow up on CPUEs. Stormy Haught, again, Fish and Game Habitat.

MR. PADULA: Mic, please.

MR. HAUGHT: Reading through the ISR, it's, you know, there's a statement in there that block nets were used [if possible] and my question is, you know, looking at the CPUEs, say just given a gear type, electrofishing, it would be nice to be able to see which estimates of CPUE were generated using block nets and with other ways of preparing them and (indiscernible - distance from microphone). It seems like having a block net in would not have (indiscernible - distance from microphone) a change or capture with that (indiscernible - distance from microphone).

MS. KEEFE: Okay, that's something we can think about. The Upper River, I don't think we were as successful with maintaining the block nets in those habitats. They're pretty fast, steep rivers, for those of you who haven't been there. They're hard to sample, if you want to keep a block net in place for any length of time, but we did have more luck with the block nets in the [Middle River].

MR. PADULA: Jeff.

MR. DAVIS: Yeah (affirmative), I had some additional comments to bring out or points. Did you have something?

UNIDENTIFIED SPEAKER: You can ((indiscernible - distance from microphone)).

MR. DAVIS: You talked a lot about a modification as far as the screw traps, and a lot of that was based on 2014 results, which -- or some of it was based on 2014 results, which we haven't had a chance to look at yet. You are planning to put a screw trap at the dam locations, I heard, and this will be the first year, or did you do that already or -- you said river mile 200, right?

MS. KEEFE: River mile 200 is where the trap -- it's -- it was the best site that we found for installing the trap and we feel like river mile 200 worked pretty well.

MR. DAVIS: So that was installed last year?

MS. KEEFE: It was installed and operated throughout the open water period.

MR. DAVIS: One other potential location for a trap or screw trap, or one location that the services have talked to us about for a screw trap would be in the mainstem river above the dam to see if any fish spawning upstream, possible in Tyone, possibly further up, I know that one Chinook was tracked further up there. One tag was tracked further upstream, and so one recommended study modification is put a screw trap in the mainstem Susitna upstream of the dam location.



MS. KEEFE: Upstream of the reservoir?

MR. DAVIS: Reservoir, sorry, reservoir.

MS. KEEFE: That's all right.

MR. DAVIS: Thank you.

MS. KEEFE: I caught where you were going.

MR. DAVIS: Yeah (affirmative). No comment on that? One more comment then, the PIT tag study, do you want to talk about the PIT tag studies, Sue?

MS. WALKER: Sure, and this is Sue Walker with NMFS, and in reviewing the PIT tag results, we find that there are really only 42 recaptures or resighting out of, I forget the original number, was it 1,100, the tagged fish, somewhere around there. It's close enough, and based on those returns and based on the inability to determine the direction of fish migration, we would recommend at this point that the PIT tagging study be dropped and that it be replaced with much more intensive fish studies within these habitats, beginning with late spring, early winter under ice.

We need to be able to determine when fish are out-migrating from these important overwinter habitats and we're not catching them with any of the early life history work, due to the difficulties of sampling around ice-out. So we would

recommend some intensive, late March, early April, depending on the year, you can go later than that, sampling and then sampling as soon as possible after ice-out, because we don't believe that the PIT tag is really resulting in very useful information, and I'd like your comments on that proposal.

MS. KEEFE: Well, I think the PIT tags exceeded our expectations, especially in the Middle River, but also in the Upper River, because we didn't have very high expectations for them.

As we say in the ISR, and in the study plan, the PIT tags were about getting very precise information about very few individuals. We weren't trying to document any kinds of population effect. We were trying to get information, descriptive information about how fish may be moving when we're not out there, and so 42 fish is 42 more fish than we had.

Without PIT tags in the Upper River, we wouldn't know that there was a humpback, white fish, that left the Upper River and came all the way down into the Middle River. So you're right, it's not big information about huge population level effects, but it never was intended to be. It is looking at very few individuals to get -- to learn as much as you can, very precise information about very few individuals,

and we were able to do that, and we learned some things about fish in the Upper River that we wouldn't have learned without it. Your -- as far as your proposed modification, we'll have to read what it is and take that under consideration.

MS. WALKER: Yeah (affirmative), I guess I would add that we question how precise the PIT tag information really is, the way the sampling was conducted. The way the arrays were set up, there's no way to really determine the direction of fish movement. If the tagged fish were -- they were tagged and then these are fish that are already moving downstream and then they were returned upstream with tag arrays.

In a lot of cases, the tag arrays were placed in areas where it was easier to set up the arrays, but it wasn't necessarily the habitat the fish were targeting for migration. So we really do question, seriously, the validity, or not the validity, but the value of the information gained from this fairly expensive and intensive tagging project.

MS. KEEFE: Well, we can go back to the objective of the PIT tagging study and we can take a look at those, but in the Upper River, the PIT tagging study was really not intended to look at direction. In order to do direction with PIT tags, you

would need to put out two arrays, and we have one array and we have partial arrays, and we knew that with the size of these rivers, it was going to be a challenge to be even able to capture an entire side channel, and that information is presented in the study plan, and in the methods, and for sure in the implementation plan.

So the data is what it is. It's data. PIT tagging, you know, I tend to disagree at the level of effort for the tags. We're out there. We're handling thousands of fish, putting a tag in 1,000 of each species isn't really all that much effort, but if the data isn't valuable to FERC and to AEA and to the agencies, then it's certainly something we consider -- we can consider.

MR. GEORGE: This is Jerry George with R2. I'd like to add -- I'd just like to add that we are gathering (indiscernible - distance from microphone) information, as well, from PIT tags and it's -- it takes some time to get enough tags out, too, where you start getting enough returns.

We had a lot more recaptures during 2014 efforts. So we are getting good (indiscernible - distance from microphone) information, as well, and I think an alternative approach, too, that could be considered is moving these away, just to smaller systems in the Upper River where we could get better information on some

of the resident species, but not necessarily just the huge systems where we find (indiscernible - distance from microphone), because the technology is just not appropriate for river channels that are 50, 60-meters wide.

MR. PADULA: Do you want to discuss this some more?

MR. DAVIS: Yes.

MS. WALKER: Yes, I do.

MR. DAVIS: Yeah (affirmative), just another comment on that, I mean...

MR. PADULA: Jeff, your name.

MR. DAVIS: Sorry, Jeff, yeah (affirmative), I'm wondering, and I'm actually surprised to hear you argue in favor of keeping the PIT tag study. It seemed like a lot of work for the number of fish that you captured.

When you have a growth rate from that few of fish, is it -- how do you know that it's proportional to the population that you're sampling, and 14 fish that you got recaptures on?

MS. KEEFE: I don't think we do, but you do know that it's an actual growth rate, instead of -- I mean, you still have the ability to do growth rate based on fish length for the entire population. It doesn't take that away, but it's an actual growth

rate of that individual fish over time.

MR. DAVIS: So what is your other approach to get growth rates? You said it didn't take that away.

MS. KEEFE: It doesn't take away the ability to do length frequency analysis on fish and get, you know, estimate growth that way. I mean, there are other ways to get growth.

MR. DAVIS: Yeah (affirmative), I think we can continue the conversation in written comments, but one other thing that I just wanted to bring up, is you did talk about modification to the sampling for tributaries, and again, I think that was largely based on 2014 data, and so we haven't had a real chance to look at that yet, to evaluate whether that's -- if that comes out. I assume that's going to be part of the discussion in January?

MS. KEEFE: I would assume so, because it's in the TM for the Upper River, the results for the Black River, where we gave it the test run.

MR. CLARK: Hi, I'm John Clark, St. Hubert Research Group, and I guess I have a question. I want to follow up on a question that Hal Geiger asked about the tributary sampling and the -- basically, if you look -- and it's probably to Alice, but it

looked a little bit like a sub-sampling. You had, say an 800-meter sample unit, and then within that unit, you would choose certain mesohabitats in the tributary. So it wouldn't be the whole 800 meters, it would be a subsection of that different unit length, not the pool or a riffle or something like that, and I guess, do you have the ability, then, to expand those mesohabitats over the macro, let me get the terminology right, the macrohabitat of the tributary, and is that in the database somewhere, where you know what that 800-meter sampling unit, I guess, represents, you know, as far as the different mesohabitats and the links within there, you know. Do you understand sort of what I'm asking?

MS. SHELLY: I'm not sure I completely understand what you're asking, but - - because there's that word, again, expansion, and I'm not sure what you mean, because we're not really trying to expand anything there. We're focused on mesohabitats in tributaries. So we are -- we split the tributary up and we -- to try to get a spatial distribution.

We don't have mesohabitats mapped in tributaries. So we split up the tributary and went to a spatial random sample of locations in the tributary, and then we looked what mesohabitats were available and selected one and sampled it.

So you can call that a sub-sample, but mesohabitat is what we're trying to get, and in 2014, we have plans to sample a little bit more extensively at those units. Did I answer your question kind of?

MR. CLARK: Yes, I think you did. I think the confusion a little bit is the macro -- macrohabitat is -- you tend to be after, at least in the other macrohabitats, but the tributary seems to be so the different (indiscernible - speaking simultaneously)...

MS. KEEFE: Yes, the tributaries are different.

MR. CLARK: Okay.

MS. KEEFE: We have different habitat classifications for the tributaries, and the macrohabitats are different in the mainstem Susitna and in the Middle River than they are in the tributaries, and as Alice said, when we did the GRTS panels, we used 800-meter panels that were basically stacked longitudinally for the length of the tributary and then we -- that was the GRTS selection, was of those panels, and then within those panels, we went in to sample.

MR. DAVIS: So -- so this is Jeff again. So that was a study modification, right, because the proposal in the revised study plan and implementation plan was



select standardized units of lengths within these tributaries and sample a portion of them, 25% or 15%, depending on the species.

MS. KEEFE: No.

MR. DAVIS: Let me finish, please, and so the discussion and comments on RSP was the length of those sampling units within tributaries be proportional to channel width to incorporate all the mesohabitats within that sampling, and the way I see the data from the first year, that wasn't followed.

For example, it was supposed to be a minimum of 200 meters, but it was supposed to be based on 20 times channel width, and you were supposed to sample that whole area, but then, you sub-sampled riffles or pools within that unit for the tributaries. Now, I'm not -- we haven't seen the data, necessarily, from that or from the 2014, but that is a different modification from what was proposed in the RSP.

MS. KEEFE: I think that you're mixing up a couple of things. I think you're mixing up the 800-meter GRTS panel and the FERC determination that said that your sample unit should be 200 meters, 400 meters, or 800 meters, which we stated as a variance in the ISR, that we did not follow those 800, 400, and 200, for field -- when the field crews went, as we talked about previously, at the TWG, when the

field crews got out there, they realized that they couldn't sample 800 meters of stream and go to all of the panels that we had selected, and still get back in time to have four days off and do it again the next month, and do this three times and be done by October. So they made an adjustment and in the tributaries, I believe they sampled 100-meter sampling units.

So that's one aspect, but the meso -- the sampling is as Alice described. That was described in the implementation plan that was filed in, I believe it was April 1st, of -- maybe it was March 1st, 2013. So what you're talking about, that 25%, those were the discussions we had early on and that's what we were hoping to target and we thought we were going to get some information out of the remote mapping, but the tributaries were too -- we weren't able to get that mesohabitats in the tributaries.

So we went away from the 25% at the end, and the change from the RSP to the final implementation plan, and we applied this GRTS approach, and that took us away. So we had this goal of like 15% in some tribs, and 25% in some tribs, but that wasn't -- I mean, the goal was to go do these panels, select panels, and the panels were to represent approximately 15% or approximately 25% of that.

MR. DAVIS: I would just comment that that's a different interpretation that I

had of the RSP, the implementation plan, which we can follow up. We read the comments to FERC.

MS. KEEFE: But we can -- and it's -- there is a study plan on the -- I meant technical memo on the Upper River, and it's why, in part, we did this analysis. Once we finished the 2013 data, we looked again at the FERC study plan determination and the -- their rationale for why they wanted the 200, 400, and 800, and we said, "We can do better than what was done in 2014," and we came up with this proposed approach.

We did the analysis that I showed you in that table, using a different drainage-based analysis that comes up with how many meters you should be sampling, and we just -- the only thing we did in 2014, was we split those 3,000 meters, I think it is for the Black River, amongst our GRTS panels, so that we get that spatial representation, but we can...

MR. DAVIS: Yeah (affirmative), I can only...

MS. KEEFE: We have...

MR. DAVIS: ...comment when I see that data that you're talking about, because...

MS. KEEFE: Yeah (affirmative), you can read that and we can talk about that in January.

MR. DAVIS: ...it's the first one.

MS. KEEFE: It'll be a good talk. I'm sorry to say that...

MR. GEORGE: Is the -- I pulled the language from the implementation plan, as well. It describes how the mesohabitats would be selected within each panel and...

MS. KEEFE: Okay.

MR. CLARK: Can I just ask one quick question? Then you do have a database for that 800-meter sampling unit that has a measurement of all the mesohabitats within it?

MS. KEEFE: No, selected mesos within each 800-meter panel.

MS. STEIMLE: Hi, this is Kai with R2. Just to clarify that we don't have a complete habitat mapping for the tributaries. So there's not a complete inventory of the lengths of each mesos within each panel. We don't have that habitat mapping of the tributaries at the mesohabitat scale, right. That's what I understood the question to be, do we have a database for each panel of how much length of each mesohabitat

is within that panel? So if that -- yeah (affirmative).

MS. KEEFE: You know, this is all related to 2014 studies, and I'm really sorry to cut the discussion off, because I know that's what we're here for, but because we're going to have these -- you guys are going to have the opportunity to read the analysis that we did and the tech memo where we applied this method in 2014, it would really be best to save this for January and move onto 9.6, because he keeps telling me we're late, and we have 13 studies to get through, okay. All right, great.

MR. PADULA: We do want to get through one more before we take a break.

MS. WALKER: This is Sue Walker with NMFS. I would just like to add that this study, in particular, requires a much greater amount of time to discuss. So I think the conversation here has been truncated due to the schedule. I think we should try to continue it at some point, in a setting where we can really discuss the pros and cons and issues amongst the scientists, because we just barely touched on the concerns that we have.

We can follow that up with writing or we could arrange, at some point, for a real detective technical work meeting, which is what I would recommend.

MS. KEEFE: Okay, so...

UNIDENTIFIED SPEAKER: (Indiscernible - interference with speaker-phone).

MR. PADULA: Is that someone on the phone? Okay.

**STUDY OF FISH DISTRIBUTION AND ABUNDANCE IN THE MIDDLE AND LOWER SUSITNA RIVER (STUDY 9.6)**

MS. KEEFE: Okay, moving onto 9.6 Fish Distribution and Abundance in the Middle and Lower River. This study is very similar, with similar objectives to the Upper River. One of the differences, in the Middle River, we have a number of anadromous salmon and multiple life stages, and so we have two different focus areas, sorry, areas of focus. I should be careful when I use that word.

One is, we have an objective that's specific for early life history that's monitoring fish as they -- juvenile salmon, as they, you know, emerge from the gravel and are moving into early varying habitats. That was a specific objective and there's a study component for that, and the other is -- I just lost my mind, a winter studies. There was a winter studies component for 9.6.

So the study components on this study, mimic the objectives. The variances

are all written up in Section 4 of the 9.6 ISR, again, related to permitting, land access. One unique one in this particular study was the fact that, related to another study, there was extended planning that went on with changing focus areas and determining where focus areas were. So we had to adjust after our study plan was done to the new focus areas.

That ended up being a variance for us, and then, we also had a screw trap that was lost in the Indian River and it was a fairly effective trap. So we moved the Curry trap and stopped operating the trap at Curry in the middle of the season. You all have heard about that before, and the last one was the mainstem sampling in the Middle River.

We did follow the FERC recommendation for 500 meters for boat electrofishing, but it was just not logistically feasible for other mainstem methods, backpack electrofishing, seining, et cetera, so that is a variance that we had.

There's a lot going on in the Middle and Lower River. This is -- I couldn't possibly put a slide up here that you could see the -- all of the sites, because we had over 200 different sites that the FDA crews went to, in addition to traps and tagging and things like that.

This is actually a typo that I caught early this morning. It says Upper River and it should be Middle River. I apologize for that, but basically, what this is telling us, is we put together locations, you know, Middle River focus area, Middle River Reach 6 focus area, out in the focus area of study, and it's showing you the number of times that people were out in that place, in that area, collecting data.

Most of the site for FDA were visited three times. Some of the sites, if they happened to be winter sites, early life history sites, FDA sites, radio tag sites, they were visited as many as 18 times during 2013, and you know, so there you have it.

Large, big picture overview, 18 different species observed in the river over 54,000 fish that were observed or collected. Early life history component, we were able to observe more than 2,000 juvenile salmon in different habitats. Rotary screw traps worked really well in the Middle River, catching thousands of fish in the traps.

PIT tagging, again, exceeded our expectation. We tagged over 5,000 fish. We had over 765, I think was the number, of fish recaptured. We had over 124,000 detections that we -- of the PIT tag arrays in the Middle River, and more than that in the -- that's in the ISR, more than that when we talk about the (indiscernible - voice lowered) TM.



Focusing in on PIT tags for a minute, we learned that for these two species, Coho and Chinook, most of the fish that were tagged in off-channel habitats tended to stay there, but these fish that were tagged in tributaries, a good portion of them tended to move into the off-channel habitat.

We had some challenges with fish identification. You will -- those of you who participated in our meetings know this, because we've talked about this before in [TWG] meetings. There are certain locations on this river system where different -- there's a lot of variation [phenotypic] variation, appearance, coloration, marks on the outside of the fish that makes field identification of fishes very challenging, and we had a large -- a couple of sites, we had large numbers of unidentified salmon because of this.

So here's just a couple of photos I'm going to walk through with you. This first photo is a fish that shows some signs that are more consistent with a field identification of a Coho salmon. The second one is a photo of a fish that shows some of the characteristics of a Chinook salmon, and really, when you look closely, this is the same fish, and this same fish shows characteristics, a handful of characteristics of Chinook salmon and a couple characteristics, including tell tale

characteristics of Coho salmon.

So when crews had 2,000 fish that they pulled up out of the fyke net, and they're all in buckets, and they've got to work them up as fast as they can, because we don't want to kill fish, that's not the business we're in, they have about, you know, I'm guessing 15 seconds to make that field call, and they've got conflicting characteristics that they're looking at.

So what we told our crews when they told us in 2013 that they were having challenges with this, we sent some samples of Chinook and Coho to ADFG and we asked them to do some analysis, and they showed us that we were having some error in our calls.

So we then asked crews to sub-sample, sub-sample with photo identifications, sub-sample with genetic analysis and then third, would be the -- get some voucher specimens, so we can actually do some (indiscernible - voice lowered) on these samples. So we have a QC protocol in place that allows us to go in where we have unidentified salmon, for example, and to do a photo review, and we conducted one of these photo reviews prior to developing the ISR.

We had, this was Slough 6A, which had hundreds of unidentified salmonids

from that fyke net that I was talking about, and we went and we sent the photos out to three independent reviewers, all senior fisheries scientists, all have had experience in the Susitna Basin. We asked them to look at the photo.

If you take a look at their answers, you can see that they didn't all match. There was some discrepancy about ID'ing these fish in the field, but we had subsequent conversations with ADFG. We talked about what would be the best tell tale sign to use for these fish in this system, and we went back and did an adjustment, and what we did, was we created a new column in the database that's called photo ID, and we then listed the photo identifier for that fish, and were able to reclassify 436 of the unidentified salmon as either Chinook or Coho, and there were, in fact, both Chinook and Coho, based on the reclassifications in Slough 6A.

Moving onto radio tagging results in the ISR, this is just an image of movements of grayling, and I think the most interesting thing that we had so far in the ISR, which is early in the data process, is that Arctic grayling and rainbow trout moved the most, probably not surprising. They moved into tributaries from the mainstem, and I think it's also important to note that Northern pike remained near their tagging locations throughout the duration of the tagging study.

Now, in the ISR, we talk about, and we -- implementing the winter studies program. Winter is a funny -- a funny season. It overlaps two years and we didn't -- weren't able to get our data analyzed in time to include them in the ISR. So we, unfortunately, had to wait and do a technical memo for you, so you could have the results of the first year of winter to help you when you make your decisions, and we filed the TM on the winter study, and I understand that we'll discuss this later in January in more detail, but I'm going to present an overview of the Winter TM anyway.

We were very lucky in 2013, because we were able to go out in November, prior to ice-up and get a last check on where these fish might be setting up for the winter. We went to -- then went back in February, March, and April, for under ice and winter -- more typical winter sampling.

We went to 59 sites. They were -- they were basically in three focus areas or locations we could get to from our camps that were based in these three focus areas. We also tried to go to some repeat sites and we decided that it would be interesting to go to some of the GRTS panel sites from the middle or open water period in the wintertime. So we included GRTS panel sites in those 59 sites. We included GRTS

over-samples in those 59 sites, and then there were just some opportunistic sampling, where people thought it would be a good opportunity.

Multiple methods used appropriately for open water versus under ice, we also incorporated [remote] methods, video underwater, sonar, and biotelemetry. I don't know how this works. Do I just click on it?

MR. GEORGE: I don't think it will work on a pdf.

MS. KEEFE: All right, sorry. All right, so we do have underwater video, if anybody's interested in watching, Jerry can show you it on his computer, maybe at a break sometime. It's pretty cool. We did watch the video and actually get document numbers and composition of fish off the video.

So a big picture overview, we encountered 13 different species of fish. Juvenile salmonid composition appeared to vary between the habitat sites that we went to, and fry weren't noticeable in the sampling early on, but they started showing up in mid-March.

Interesting, really interesting results from the PIT tag arrays and the electrofishing and the sonar on crepuscular activity. More fish appear to be more active at dawn, at night, and at dusk, and we were able to, you know, get some

information on fish in those night versus day time periods, and as you can see from these graphics, the patterns of increased activity was consistent over the months that we sampled.

This is just another PIT tag movement study. It documents fish moving between habitats and some of the big picture things that we noticed aren't really earth-shattering. Most of the Coho in tagging focus areas and then macrohabitat stayed there, but some of the fish did move, and again, it's that out of tributaries, into off-channel habitats that we're seeing.

Radio telemetry studies, I'm sorry, radio telemetry component of the winter study, basically talked about fish using mainstem habitat for overwintering.

Tagging -- tag at large analysis, as we've got here, the tags that we did not tag in 2014, but these are active tags. So these are tags that still are being detected when surveys are flown. There are seven out of either of the species still with active tags out there.

In addition, in 2014, we were able to go out and access all of the sites that we didn't have access to in 2013, included 25 GRT samples and five direct sample tributaries.

We did have some modifications. They're all listed in Section 7 of the ISR, and I think that the most significant one is really, as Jeff talked about, is moving screw traps. We'd like to propose to move the trap locations from Curry up to just downstream of Portage Creek, and from Montana Creek proper to the mainstem downstream. I think we talked about that in our March technical meeting.

Steps to complete, we've completed the winter pilot study and we've completed two seasons of the early life history study. We have one year left to complete for all of the other study components. Given that we've completed two years of early life history, we anticipate that 2015 will, early life history, will focus on analysis and integration, but we'll continue with fish distribution and abundance sampling, as described in the study plan and ISR with modifications, by the telemetry, winter studies.

MR. PADULA: It's up to 27 slides.

MS. KEEFE: That would be good. It's close.

MR. PADULA: I'm ready to get something to drink, take some (indiscernible - distance from microphone).

MS. KEEFE: I'm actually going to sit, if you don't mind.

MS. MCCRACKEN: This is Betsy with Fish and Wildlife Service (indiscernible - distance from microphone). We would like to suggest taking a break and then coming back, because we'd like a few minutes.

MR. PADULA: Before you comment on the subject?

MS. MCCRACKEN: Yes.

MR. PADULA: Sure, I mean, we can take our 15-minute break early. So it's 10:15. We'll reconvene at 10:30. We'll continue with questions and discussion on this 9.6.

10:15:48

(Off record)

(On record)

10:32:14

MR. PADULA: So I appreciate everybody being prompt. We had -- Marylou had taken us through the 9.6 presentation and now, we're into the discussion portion. So again, looking around the table, any of the agencies want to start us off? Sue, anything from NMFS or Stormy, Fish and Game, or Fish and Wildlife Service? You've got a microphone.



MS. LOR: Yeah (affirmative), is this on?

UNIDENTIFIED SPEAKER: Yeah (affirmative).

MS. LOR: Yeah (affirmative), we would like to request...

MR. PADULA: Your name, your name, please.

MS. LOR: Soch Lor with the U.S. Fish and Wildlife Service, and we came here with the expectation of focusing our discussion on the 2013 studies, and we would like to request to continue those discussions on the 2013 study. So before you jump off onto Part C, let us get our comments out on Part B, first, and we'll continue that discussion on the 2013 studies.

MR. DYOK: So this is -- this is Wayne Dyok, Alaska Energy Authority. I think what we want to do here going forward is to focus on the 20, you know, 13, and what we've asked our presenters to do, to presume that people have reviewed these presentations and we'll even cut them shorter than what they have been.

We'll focus on the study plan, you know, modifications and just move forward. So they'll do the best, to the extent that there's a question that comes up that relates to 2013, that's partially addressed with the work that we did in 2014 to help answer that, we'll try to do that, and maybe we'll, if in some instances, we'll just

try to, you know, articulate what your comments are and respond to the best that we can. So we'll try to accommodate, you know, that as best we can, so...

MS. MCCRACKEN: This is Betsy with -- Betsy McCracken with Fish and Wildlife Service, and we still have a lot of concerns related to the 2013 studies and so that's why we make that request, and I'm also wondering if we could go back to 9.5, because we have a study modification for that project we wanted to bring up.

MR. PADULA: Do you want to finish 9.6, first, and then go back to 9.5?

UNIDENTIFIED SPEAKER: No.

MS. MCCRACKEN: Not -- yeah (affirmative), okay, so I'm just going to tell you. We'd like a study modification in 9.5 for above the upper reservoir for some additional sampling of fish sampling.

MS. KEEFE: We'll take it under advisement. You know, that's something that we can...

UNIDENTIFIED SPEAKER: Mic.

MS. WALKER: This is Sue Walker with National Marine Fisheries Service. I just wanted to add that the reason for the study modification is that when we're looking at the tributaries to the upper reservoir, we're looking at all of the tributaries

and we're not looking at -- is the mainstem.

We know now, at least, that one radio tagged Chinook salmon did migrate all the way up to the headwater lake, so we know migration is certainly possible for salmonids and other residents -- and resident species, yet, we're not looking at the mainstem.

So the reservoir will certainly affect the mainstem of the river. There's no question about that, especially with a five-foot horizontal varial zone where the reservoir will be fluctuated or the head of the reservoir. So we do need to know what fish use is in and out of the mainstem above the proposed reservoir. Thank you.

MR. PADULA: Thanks, Sue.

MS. WALKER: And another comment, I'll try to keep it short, but in terms of focusing on study modifications, yes, it's one of the things we're here to do, but the other thing we're here to do is look at the effect of variances.

We have comments on those and we would like to focus on the 2013 results and to be sure that we do have enough time to raise our concerns. Thank you.

MR. PADULA: Yeah (affirmative), we'll try and make more time available

by keeping the -- I think the technical, kind of, middle portions of our presentations, shorter to make sure we get to variances and to proposed study mods. We're going to make that effort going forward.

MS. MCCRACKEN: This is Betsy McCracken, with the Fish and Wildlife Service, again, and I just wanted to follow up to Sue's comments and the 9.5, and -- related to the juvenile sampling up there and the results of some of the Chinook sampling and it seems that there's more Chinook salmon up there than we thought. So that's also in support of the additional sampling request.

MR. PADULA: Anything else on 5? We can come back to 9.6, okay. Does anybody want to start?

MR. HAUGHT: Sure, I'll go ahead and start a comment, yeah (affirmative).

MR. PADULA: Fish and Game.

MR. HAUGHT: Stormy Hought, Fish and Game. I just wanted to kind of reiterate the same concerns I had for 9.5. I also have the same tagging concerns for 9.6. There does seem to be a lot of tag-related mortality, and I think that it would be good to bump up the tagging goals from 30 for resident species, bump those up, at least as much as the mortality that we're seeing. So I put that out there and I guess,

the follow up, again, just to reiterate my previous 9.5 concern with the CPUE calculation, using with and without block nets, you know, if block nets are difficult to use, potentially, we should just get rid of them and then we'll at least have comparable information on (indiscernible - distance from microphone) effort.

MR. PADULA: Thank you, Stormy.

MR. GEIGER: I'm Hal Geiger, St. Hubert Research Group. So I have a question. It relates to 9.5, as well. So I'm still pretty new at this and I'm still struggling to figure out several things about the CPUE data, and of course, that term CPUE is just used as if it's one thing, but it's several things being called by the same name, but ultimately, what is the CPUE data going to be used for? How will that affect a decision having to do with the dam?

MS. KEEFE: Is this on?

UNIDENTIFIED SPEAKER: It should be.

MS. KEEFE: The CPUE data is -- right now, what we're doing is we're characterizing the environment that's out there, and the reason I believe that people requested CPUE and FERC study plan requested specific kinds of CPUE, was to help us with respect to relative abundance, not just use counts, but so that we could

have some comparative level of relative abundance, CPUE across mesohabitat types.

The CPUE, as presented now in the ISR, is by method by habitat type and that's why it's presented that way.

MR. GEIGER: Will this eventually feed into other components of the study that I haven't been reviewing, say the habitat suitability functions or something?

MS. KEEFE: No.

MR. GEIGER: Or will this be used anywhere else?

MS. KEEFE: No, it will be used to characterize the relative abundance of fish in mesohabitat.

MR. GILMOUR: Marylou, this is George Gilmour with (indiscernible - distance from microphone) services.

MR. PADULA: Hold on a sec, we'll get you a microphone.

MR. GILMOUR: Okay, thank you. Along those same lines, I think it's important here that we not only determine the distribution and relative abundance, but what the life history characteristics of those same fish are exhibiting.

You know, you're capturing these fish at the life stages. You're seeing them out-migrate. You're seeing different patterns that are obviously going to be very

important to when it comes to looking at a range of operational scenarios, developing fish passage facilities, operating those facilities at certain times of the year, and I'm looking for that linkage, and once again, to this study, and how that will inform.

There has to be some way to inform project operations, for example, pulse flows to simulate out-migration, and I just -- I'm interested in hearing a little bit more about those linkages.

MS. KEEFE: Well, I don't know that we have the linkages worked out yet, George. They're certainly not in the ISR. So I think, unfortunately, that the focus of our discussion today is on the ISR and hopefully, we can address that in the future.

MR. PHILLIPS: My question is also along the same lines.

MR. PADULA: Identify yourself, please, sir.

MR. PHILLIPS: Sorry, Guy Phillips, Kier Associates. My question is also along these same lines as to just how this data is going to be used, how it's going to be fit together into the overall picture. I've heard now a lot of raw data being collected in papers. There's a lot of reference to modeling exercises and so forth, and I'm wondering how this is all going to be pulled together in a way that's helpful

because I also just heard how it is not going to be, so it's kind of (indiscernible - distance from microphone).

MR. PADULA: I think, at least -- and the folks at AEA can add to this, if you go back to the approved study plan, that really does lay out the more complete vision of how we move from data collection to data analysis, modeling, and then integration of all of that data and information to start addressing these questions about impacts, as well as, again, potential opportunities for protection, mitigation, and enhancement. So it's all in the study plan, but where we are in time, again, is really just trying to review where we are in terms of efforts that have been reported through June, with some discussion of '14, where it's relevant to questions.

So again, I don't think anybody has missed that need to do that. We're just not there in time. Wayne, do you want to add anything to that?

MR. DYOK: I think these are good questions and it's something that we should keep in mind, and anything that we do is, how are we going to be using this information? I think what we just heard from, you know, Marylou is that the, you know, catch per unit effort is going to be used to get relative abundance.

We're going to be hearing more from, you know, Dudley and his team on how



the modeling is going to, you know, work together as he gets into the instream flow discussions a little bit later. A lot of this information, you know, feeds into that.

So I think sometimes, you know, we, as scientists, and I'm just an engineer, I'm not a scientist, you know, can get wrapped up in terms of all of the detail, but you know, certainly detail is important to understand the characteristics of the system, but at some point, as George Gilmour just said, that we need to look at how this is going to affect decisions.

So how is it going to affect the protection, mitigation, and enhancement? How is it going to affect the operation of the project in the future, and if there's a fish passage, how will this fish passage, you know, figure into that? So we need to understand, you know, the baseline characteristics. That's what we're doing here, but let's not get -- let's kind of look at this from the perspective of the information that's really needed, you know, for those activities, and we do want, you know, accurate data, of course, but I think that we just need to be careful that we don't go overboard as scientists on what we're doing. We get what we need and only what we need.

MR. REISER: Steve, can I make one comment?

MR. PADULA: Get the microphone, too.

MR. REISER: Yeah (affirmative), this is Dudley Reiser with R2, just to follow up on that, is this on?

UNIDENTIFIED SPEAKER: Yes.

MR. REISER: Just to follow up on what Wayne is saying on the instream flow piece, and we'll talk about that more on Friday, but one obvious thing here, when you think about linkages is periodicity and just getting that information from, you know, where are the fish and what times are they there? When are they moving out of the system, and that's directly going to be, you know, fed into some of the work that we will ultimately do with the modeling piece, understanding the periodicities of how these fish are moving through the system. So that's an obvious piece of it.

There's other -- I'm sure that once we get into the more detailed analysis on this, there will be other pieces of information that will be very valuable and sort of firming up those, either the periodicities or the distribution and how we're going to apply that into the modeling, itself. So just -- and you'll hear a little bit more about some of that on Friday.

MR. PADULA: Thank you, Dudley.

MR. WOOD: My name is Mike Wood and I kind of want to speak on what Dudley was saying. I had a question or a comment regarding, I guess, macrohabitat. My name is Mike Wood and I live on Susitna River and so I'm seeing it every day. I think Sue's, Ms. Walker's comment about the border seasons, like late fall and early spring, and then there was a timeline up there of when people are out on the river.

The majority of the studies have been done in summer when it's easy to get out there, and there's been quite a lack of -- or noticeable effort for wintertime and we believe that would be a huge impact of this dam running. So my question is, is right now or the timeline of who goes out there in the field collecting data, October, November, December, January, and then May, April and May, seems to be a little bit more lacking than the other months on that calendar, and what the river looks like today is very different from what it looked like, even two weeks ago.

I mean, right now, it looks like it's clear and like last night, you can sit down on the edge of the river and watch multiple small, juvenile fish going down river right in the mainstem, and so my only comment is, is it would be great to see a much greater effort in these shoulder seasons and in the winter, freeze-up, the ice-jamming

and real frozen all winter, because those fish are moving now and they're moving now and they'll be moving throughout the winter and they'll be waiting until spring to move next, just to document that like Dudley's saying, we need that information to feed into that modeling.

MR. PADULA: Thank you, Mike. I appreciate your comment. Anybody else? Jeff, do you...

MR. DAVIS: Yeah (affirmative), what do you mean do I have something to say? Of course I have something to say. When have I not had something to say? All right. Yeah (affirmative), I have, just I guess, a statement on study 9.6, and we'll follow up, you know, comments to FERC, you know, at the appropriate time, but I guess, to start with, I don't agree that the fish that was shown up there was difficult to identify. I think it's clearly a Coho salmon, and I'll follow up again with some more information to back up that statement.

I don't agree with post-project identifying fish, based on photographs, because it's difficult, depending on the quality of the photograph that's taken.

I have concerns with the study as implemented that it in some way did not implement the FERC study determination, primarily in the sampling units, in that

tributary mouths were supposed to be sampled, including the mouth and the 200 meters downstream. That wasn't conducted.

Clear water plumes were selected as a separate habitat and sampled, disassociating the fish that may be in the tributary mouth and those in the plume downstream. I disagree with the sampling units that were selected in off-channel habitats, side sloughs, and upland sloughs, which were supposed to be 200-meter sampling units at a minimum, extending from the mouth and occurring upstream.

Based on the ISR, it appears like those habitats were reclassified based on the clarity of water, which I don't think is appropriate. I think that the RSP comments from the services were clear, that they were interested in looking at the relative abundance of fish among the macrohabitats that may have differential effects from the project, those being more lateral in the flood plain, would be more susceptible to effects with changes in flows than the mainstem and side channel habitats.

I disagree with your -- there's a discussion in the RSP about whether we'd sample mainstem, split mainstem multiple, split mainstem habitat types. The services recommend that you didn't do that, which was implemented. Only mainstem and side channel habitats were sampled, but the services also recommend

that effort be redistributed to getting more replicates of the off-channel habitats, which they felt were more important and more variable. That wasn't done.

I, again, don't believe that the (indiscernible - voice lowered) unit effort data that was obtained within the sampling units within the macrohabitats allows for comparisons among macrohabitats to look at differences of fish use among those.

I believe a lot of the methods that were used to collect fish in the early life history study were inappropriate for early emergence salmon, particularly minnow traps, which are ineffective at catching sockeye salmon, and sampling gear with 1/4 inch mesh that's also ineffective at capturing salmon that are less than 45 millimeters (indiscernible - voice lowered).

I think Mike made some good points about distribution of fish this time of year, that the migrant traps could still be operating and we could see if, particularly Chinook salmon, are redistributing and locating in off-channel habitats, which is something that we've seen in some early winter work that we've done.

Let's see, study modifications, a lot of the information that was presented was from 2014 data. So we haven't had a chance to look at it. One thing that was brought up was a screw trap at Indian River. I think we should take a look at that.

Right now, we don't really have an idea of when sockeye salmon may be moving from spawning habitats in the mainstem and redistributing in the spring, as they come out of the gravel.

Again, part of that's due to the inappropriate gear selection for the early life history study, but it may be a potential to use that additional screw trap to get the movement of sockeye salmon, which was documented pretty well in the 1980's, particularly as there's already screw traps in Indian and Montana that are both -- have a large number of Chinook and Coho salmon. So those species are already covered. I think the portage would just be another measure of Chinook salmon. It may not be as useful as some other sites.

I'm sure I have some more to say and I'll remember it afterwards and I'll put it in my comments. Thanks.

MR. PADULA: Thanks, Jeff.

MS. WALKER: This is Sue Walker with NMFS. One thing that I wanted to recommend is that there's been a proposal to reduce, or actually, the sampling length in main and side channels has been reduced from 500 meters to 200 meters, and that is not a modification that the services would like to see.

We would like to see that FERC ordered 500 meters of electrofishing in these main channel habitats, and we would also like to couple that with some more intensive sampling on the borders of those main channel habitats, including minnow trap sampling in the near-shore habitats. I have more, but I'll say those soon.

MR. PADULA: Thanks, Sue.

MR. HAUGHT: All right, I just have a follow-up here on the fish identification issue. I would agree with the previous comments, you know, the fish that was used as an example. That's not really an ambiguous fish. I don't think. There's a lot of (indiscernible - distance from microphone) variability and coloration of these fish, but you know, you look at the (indiscernible - distance from microphone) coloration expressed on that fish, it's a Coho, and I think most people would (indiscernible - distance from microphone) would tell you that.

So I guess my concerns, and as a follow-up to that, Marylou spoke earlier in the meeting about doing some sub-samples that identify fish (indiscernible - distance from microphone) I guess, and I guess my concern there would be that sub-sample is representative of the sample that potentially misidentified fish. So I would just like to see that information at some point, and then I don't know, after your consultation



this summer/fall with experts or whatever, you kind of talked about how you may revise your identification protocols.

I guess I would just like to hear some information about that, as well, to get these field, extra field personnel trained up a little more specifically on identifying these (indiscernible - distance from microphone).

MS. KEEFE: So did, in fact, go to the anal fin after we had the photo review and the discussion, and we used the anal fin. We've also -- have done homework throughout the state of Alaska. There are situations, places where Coho and Chinook are challenging, and there are different phases, different life stages that pose different challenges and we learned that adipose fin is in some places, is one of the tell tale signs (indiscernible - distance from microphone).

So we have instructed the crews and folks that come in, on those two -- those two areas for the characterization, but we also have in place, the photos and we don't have a (indiscernible - distance from microphone), we don't have a -- yet, we have not instructed them to take every fourth fish or something like that, and so establishing protocols is something we've talked about internally.

That's standardized, take every four fish -- photo every fourth fish, take

genetics of every, you know, fifth Chinook, or a standardized approach like that to help us to make sure that we aren't just taking photos, because I think, in the first year of study, what they took photos of was the fish that they thought to be the most challenge, and that doesn't always help you as much as is if you're just taking (indiscernible - distance from microphone), so...

MR. HAUGHT: Thanks, yeah (affirmative), and I guess the only problem there is, you know, as Jeff pointed out earlier, you know, identifying these fish from those photos and having received that, you know, post-field season CD of photos, you know, it is very hard to (indiscernible - distance from microphone).

MS. KEEFE: And it has its own (indiscernible - speaking simultaneously)...

MR. HAUGHT: (Indiscernible - speaking simultaneously) but that doesn't mean that in hand, you know, possible (indiscernible - distance from microphone).

MS. KEEFE: And the other thing that I guess it's important to mention, so two things I'd like to mention about this identification. One is we will have, at the end of this year, I believe the number is 800, over 800 genetic samples that will be delivered to ADFG. So we will be able to get a field identification rate based on the significant sample size and I think that will be really useful information.

The other comment that I want to make about fish ID in these particular slough habitats, where most of the challenges come, because you do get a lot of (indiscernible - voice lowered) up in these dark, dark slough waters, is that for the analysis of impacts that we're doing for the study, the instream flow habitat analysis is evaluating the project impacts, because flow is considered the -- one of the major potential impacts.

It's not really important for instream flow whether there are -- the ratio of Chinook to Coho in a habitat is 90 to 10, 50 to 50. What's important is that we're able to identify that there are two species, and that those -- and the suitability criteria of those two species, in particular, overlap. So the model would be run to evaluate habitat for those species adequately.

MR. HAUGHT: Thanks, Marylou.

MR. DAVIS: I'd like to follow up on that...

MR. PADULA: This is Jeff again.

MR. DAVIS: Jeff, yeah (affirmative), that comment, if I can remember what your first point was, because I got -- what was your first point? I got off on the second point. Your second point was whether the data of Chinook and/or Coho in

off-channel habitats is significant to the instream flow analysis, and I think that it's not the ratio of Chinook to Coho is -- that's important, it's whether there's more Coho in an off-channel upland slough beaver pond versus a mainstem or a side channel habitat, and if you go down this road with -- well, and now I remember my first point, but if you go down this road with incorrect classification, assuming that my evaluation is correct, when you go to validate the results from the instream flow analysis, that uses the habitat suitability curves to predict the distribution of Chinook salmon, and that distribution has them showing up in mainstem or tributary mouth habitats, but yet, your fish distribution abundance study has Chinook showing up in upland slough habitats, that's going to create a problem for you when you go to validate that other data, and that is one use of the fish distribution in this abundance study that was addressed in instream flow technical working group.

The first comment you had was whether -- yeah (affirmative), I had a problem remembering your points, too, so now you can do it. The first -- the first point you had was about taking genetic samples, and I think that's a good suggested study modification for the second year of studies, but I think that the problems that we observed when we looked at the length (indiscernible) distribution and Chinook ID,

were related primarily to the fish distribution abundance and early life history studies in the middle river.

So if those fish selected, say, from the sampling for the instream flow analysis, we did not see those same problems, and I don't know where those post-project, where those samples for genetic analysis are going to come from.

MS. KEEFE: Can I add? We have genetic samples from both the Middle River and the Upper River. We're taking genetic samples from a variety of habitats, not just -- and we do have genetic samples from sloughs.

MR. DAVIS: Yeah (affirmative).

MS. KEEFE: And we have done meristics in fish from sloughs and there are Chinook in some sloughs, based on the meristic sampling, anyway, so -- but -- but you're right, I mean, we have a protocol, you know, that we started with in 2013, based on the challenges.

We'll -- we already have plans to modify with a standardized protocol. I really liked the comment this morning about a, you know, representative, to make sure our crews, field crews are going representative sub-sampling.

So -- and I think your point is well taken that we should -- we want to do that

across all habitats, not just as the downstream migrant trap, for example.

MR. DAVIS: Yeah (affirmative), and my comment was not just for across habitats, but crews. I think that some crews, particular the instream flow crew, may have been a little more experienced in fish identification than the fish distribution and abundance study. So genetic samples from fish ID'ed in the habitat suitability study may be more accurate than the (indiscernible - speaking simultaneously)...

MS. KEEFE: So point taken, we should consider taking some genetic samples from HSC, as well.

MS. WALKER: I just -- this is Sue Walker with NMFS. I think we're getting down into the weeds here. I wanted to clear up some points that seemed to be understood incorrectly in AEA's response to our letter where we identify the issue of possible fish misidentification.

Yes, we know it's challenging to identify juvenile salmonids. I've made mistakes myself. Sometimes you have to bring fish back in, but we have prepared a detailed thorough response report, which we will be submitting to AEA. It has, so far, been peer reviewed by three experts in juvenile salmonid ID.

We all agree that the fish that you're showing as a Chinoho, it's a Coho.

That's pretty clear, but I wanted to clear up one mistake in your letter, and you -- you're saying that we're telling you that if a fish is found in a beaver pond, then it's not a Chinook, and then if a fish is a certain length, then it's not an X-species, and you know, we have three different criteria, which we use to come up with a determination that we believe there's significant misidentification of fish, and that's the length distributions from the history of fish sampled throughout the Susitna River back in the '80's, that differ significantly from the fish distributions that you report.

There's the habitat associations, which are different from what's typical and from what we have found in this river, and then there's the meristics, and so we address all three of those, and all three of those were pooled together to come up with our conclusion, and that said, I think we need to address this outside of this meeting now, because it's just taking up too much of our time, and it is important to know what this data will be used for, and we believe that correct fish identification is very important.

MR. PADULA: Thank you, Sue. Thanks, Jeff, Sue, Stormy, Marylou.  
Anyone else want to weigh in on 9.6?

## **SALMON ESCAPEMENT STUDY (STUDY 9.7)**

MR. PADULA: Okay, and we're just about on schedule, which is good.

(Indiscernible - distance from microphone). Bryan Nass is going to take us to 9.7, Salmon Escapement Study.

MR. NASS: I'm going to have a little assistance from one of my colleagues. Good morning, Bryan Nass, LGL Alaska.

UNIDENTIFIED SPEAKER: (Indiscernible - interference with speaker-phone).

MR. NASS: Can you guys hear me? One of the studies being conducted by AEA is the timing distribution and abundance of the microphone in front of you. To accomplish that task, AEA has used radio telemetry, sonar, and weir technologies throughout the Susitna Basin.

This study is comprised of eight objectives that include the capture, tagging and monitoring of five salmon species. Each aspect of the program assists us in characterizing their migrations, their behavior, in determining potential and actual spawning destinations.

The objectives of this study translate into nearly identical components of the



ISR. The hands-on aspect of this program, the catch and release aspect, also allows us to catch -- to collect tissue samples for the development of the genetic baseline.

The ISR documents a few variances from the study plan, in particular, land access limitations and relatively high stream discharge in 2013, necessitated the adjustment of some of the methods, while still achieving the objectives of the study.

Key variances from the study plan included an increase in the tagging goal for Chinook salmon from the study plan, an increase in aerial survey monitoring effort, in and around Devil's Canyon, a shift to abundance monitoring in the Lower River using multi-beam sonar.

Basin wide effort culminated in the achievement of tagging goals for Chinook salmon and a repeated observation that Chinook salmon are the only species to migrate above Devils Canyon. In 2013, we had three radio tags go upstream. Further, ADF&G estimated escapement of Chinook and Coho salmon above the Yentna to be approximately 89,000 and 130,000, respectively, for Chinook and Coho, standard error estimates on those.

This is a figure of the relative frequency of mainstem and tributary use for radio tagged salmon with a classified destination. All species of salmon tagged in

the Lower and Middle River, except sockeye, were overwhelmingly tracked to tributaries. The portion to tributaries was highest for Chinook and similar for pink, Coho, and chum salmon. Sockeye tagged in the Middle River had the lowest proportion of tributary use, at about 48%.

UNIDENTIFIED SPEAKER: Just on the phone, there's a whole lot of distortion, like the mic is dragging on something.

MR. PADULA: (Indiscernible - distance from microphone).

MR. NASS: Subsequent to the second season of study, AEA developed modifications for the study (indiscernible - speaking simultaneously)...

UNIDENTIFIED SPEAKER: (Indiscernible - speaking simultaneously)...

MR. NASS: ...to improve the likelihood. I didn't hear that comment.

MR. PADULA: Yeah (affirmative), that's probably not coming from the room here, so if anyone can mute themselves, if you're shuffling paper or doing anything else close to the phone. Thank you.

MR. NASS: AEA developed modifications for the study plan to improve the likelihood of continuing to achieve the objectives of the study. Key modifications included using fishwheels as a recapture site on the Yentna, operating three

fishwheels in the Middle River, further increasing the number of radio tags applied to Chinook in the Middle River and increasing the frequency of aerial telemetry surveys, those are the normal telemetry, in the Middle River.

This is a figure of the number of salmon captured in three seasons and the number of tags applied in 2014.

MS. LANCE: We're supposed to be stopping here. Sorry, sorry.

MS. WALKER: We ask that these presentations be stopped when we started into the 2014 data, so that we can discuss the 2013 results before this is presented. This really throws us off track and it takes up too much time.

UNIDENTIFIED SPEAKER: (Indiscernible - distance from microphone).

MR. DYOK: Bryan, if you could just gather the, you know, study modifications, and you may, at some point need to refer back to this in responding to questions, but let's just go right to the study modifications.

MS. WALKER: Thank you.

MR. NASS: These are pictures of the Watana sonar study site near the proposed dam. This Salmon Escapement Study Plan via the FERC Study Plan Determination included this single decision point in this study. This requested a

feasibility assessment in 2013 of putting a weir or a sonar station near the dam site in 2014.

AEA concluded in the ISR that it's feasible to count salmon-sized fish using multi-beam sonar. That's what we concluded in the ISR. We'll skip this slide because it has to do with 2014.

Overall, with respect to the study plan, and in consideration of the data collected and the analysis conducted to date, AEA has completed data collection on Chinook salmon, and will complete data collection on the other four species this October. Analysis in reporting will be conducted into 2015, and will culminate in the product of the updated study.

MR. PADULA: Thanks, Bryan, for moving us through that quickly. So Sue, are you grabbing for the mic to (indiscernible - distance from microphone)?

MS. WALKER: Yeah (affirmative).

MR. PADULA: Okay, Sue Walker.

MS. WALKER: Yeah (affirmative), this is Sue Walker with NMFS. The agencies do recommend that AEA goes back to the FERC study plan and install a fishwheel and tag fish downstream of Devils Canyon. We know that the permit with

the Native village corporations and CIRI does allow that now and we believe that's necessary in order to get a handle on the number and species of fish entering Devils Canyon, and eventually passing upriver past the proposed dam site and above.

MR. GEIGER: Yeah (affirmative), hi, this is Hal Geiger, again, from Juneau. Well, maybe I'm easily impressed, but having done some radio tagging, I was really impressed with just the scale of what was accomplished in 2013, and but that said, as I went through and I looked at the analysis of this very powerful tool, there's lots of room for non-sampling errors.

I mean, in order to capture enough fish to get that many tags on, you had to use some kind of size selective sampling and there were a lot of statistical tests, a whole series of statistical tests, and many of those were significant for the hypothesis that the radio tagged fish perfectly matched all of the fish that were going upstream, and not surprisingly, because there were so many fish, many of those statistical hypothesis tests were significant in the statistical sense, but I thought the analysis was kind of incomplete, because it didn't go further to ask the question, what is the difference between statistical significance here and what we might call real significance, and a lot has been made that one radio tagged fish move upstream,

but then I was left kind of wondering, well, what did that one fish really represent?

Is that -- did that really represent -- was that really just one unusual fish that went up there because it was lost or did that represent 100 fish that would have gone up, but because of these failures of assumption, or did that really represent 1,000 fish, and so I thought that the analysis really should continue on to go back and try to figure out what those non-sampling errors might have done, and all of those hypothesis tests were conducted by looking at deviations from what would be expected. So there is a basis, a logical basis for going back and commenting on those non-sampling errors.

So I guess that's my introduction to the question, shouldn't -- should there be some analysis of the non-sampling errors and some speculation as to what the magnitude probably was of the fish that would go up, and there's one other point to be made in that. Anyone who's been following the "Anchorage Daily News," knows this is a period of really low Chinook salmon abundance, and so when you put that all together, I think what people really want to know is what would be typical in the future, as far as Chinook going up past there, and they want a basis for that conclusion based on the radio tagging data.

So shouldn't that -- shouldn't the analysis include -- shouldn't that analysis be more complete to look at those non-sampling errors and the relative abundance of Chinook salmon during that period, the radio tagging study that was conducted?

MR. NASS: I'd like to try to restate the question, but I'll say that I'm having difficult...

MR. PADULA: Please use the microphone.

MR. NASS: I'd say that I'd have a difficult time restating that. I understand your comment regarding non-sampling errors. I believe that was submitted to FERC and to AEA, and we have provided [written] responses that will handle that [address the issue].

I know that there are some places within the study plan where, for example, we look at error, the basin wide estimates for Chinook salmon, in particular, and as you indicated, we went through a whole series of tests to determine whether or not what we're catching in fishwheels and what we're tagging is representative of the population, and I think what we've heard already today, and is evident in any kind of fisheries work, is gears are size selected and they have certain aspects to them, but that's why we do those studies.

That's why we look at fish that we're catching, fish that we're recollecting on spawning grounds, that was the purpose of Indian weir, right, and it's the purpose of the weirs in the Lower River that validate the work that's going on there.

I'm not a statistician. So I won't try to venture into addressing the particular aspects of the [non-sampling error topic] -- the bottom line is, is that we're basically trying to address those issues -- lets come back to the objectives, okay. The objectives of this study, especially for the Middle River, was to identify the distribution, timing, and the relative abundance of spawning, and radio telemetry is just one of the tools that we use to do that, in combination with fish -- with the fishwheels, and I think that it's achieved that, and I'm not going to comment on the sampling error, and we'll respond to that in writing. I'm sorry if I can't address that [aspect] for you.

MR. GILMOUR: Bryan, this is George Gilmour. I just wanted to ask a pretty simple question and I think that has to do with, do you think the data that has been generated to date is adequate to inform transsex selection and transsex weighting associated with the instream closed study? Are you confident that the data we have is robust enough to do an adequate job to inform future modeling?



MR. NASS: Thanks, George. The question was, is the data that's been collected to date likely sufficient to inform what I would think is the modeling component that's going to come afterwards? I think that we have seen with three years of data, '12, '13', and '14, a remarkable consistency in where salmon have gone, using radio telemetry, using sonar, and on-the-ground type work, remarkable consistency in [locations] and remarkable consistency in proportions of those tags going to those destinations.

So you know, I don't know if this -- I guess I'm going to say, is yes, I think the data is extremely robust. I think there's a lot more that we can do with the information that we've collected and that's one of the chores of the USR, is to take the information that we have collected over three years and build it into much more than the annual reports that we've been able to generate [thus far], and you know, one of those components is definitely going to be relating where we thought there might be spawning, where we actually saw spawning from some of the other components of AEA's program, and being able to relate that distribution back to, you know, modeling components of different flows and that type of thing. So I think that the radio telemetry has definitely done its job in terms of distribution.

MR. PADULA: We have a question from the phone.

UNIDENTIFIED SPEAKER: Do we have a question from the phone?

MR. CUTLIP: I'm not a question from the phone, but...

MR. PADULA: Go ahead.

MR. CUTLIP: I just was wanting a point of clarification, based on...

MR. PADULA: Matt Cutlip.

MR. CUTLIP: Sorry, Matt Cutlip with FERC. Based on what I'm seeing in the ISR, and I haven't read the new materials you filed, including the 2014 data, but it looks to me that you're proposing to be finished with all of your field data collection for this study. Is that true? So what we have is what we have, as far as you're concerned, unless -- okay.

MR. PADULA: So Jan...

MS. DARA GLASS: What was the answer to that?

MR. PADULA: Jan, are you on the phone there?

UNIDENTIFIED SPEAKER: We didn't hear the answer. Is the data done, the field data?

UNIDENTIFIED SPEAKER: Three years.

MS. DARA GLASS: (Indiscernible - interference with speaker-phone) he may have hung up, because he was having problems, but I know he was trying to get through on a (indiscernible - interference with speaker-phone) to ask the question and then we haven't heard from him since.

MR. PADULA: Can someone who -- I know he was texting. Can someone text him and maybe he can text in a question and we could deal with it in the room, if he can text it in to somebody? That would be great. I think Sue is going to try and do that.

MS. WALKER: Well, I'm not sure I have his number. I was -- Dara was telling me.

MR. PADULA: Okay.

MS. WALKER: Ask Dara -- Dara, can you text him?

MR. PADULA: Dara, can...

MS. DARA GLASS: I think I have his cell phone. So I will try and get a hold of him.

MR. PADULA: Thank you.

MS. DARA GLASS: You bet.

MR. PADULA: So back to looking for a response from AEA on data collection on this study.

MR. DYOK: In terms of meeting the study objectives, Alaska Energy Authority believes that we have met the, you know, the study objectives, and we'll be talking more about the 2014 study in January, but maybe if I could ask NMFS a question here, because we haven't really discussed it, but we did have, you know, sonar in -- at the site in 2014.

So if that method is an appropriate method for identifying, you know, Chinook salmon that go upstream, is that something, that you know, NMFS would consider acceptable compared to the Devils Canyon fishwheel?

MS. WALKER: Well, this is Sue Walker. All we know from the sonar data, which that's a good study, it's really well done. We do like the sonar data. We haven't had a chance to study it thoroughly. We don't know what the precision of those estimates are, but I expect that they'll be high.

What we don't get from that, really, is the destination of fish that are passing through Devils Canyon and we do need that information, and we know now, at least, that fish do migrate far above the proposed reservoir. So we feel we need additional

information on the distribution of anadromous fish upstream.

I'd also say that the information on freshwater age two-plus Chinook from the Upper River is new and needs to be investigated, because it doesn't correspond with the length frequencies of other juvenile Chinook in the basin over the course of the last 40 years, and we believe that could possibly identify other species, and so sonar is good, but we still need the radio tagged data from the Devils Creek fishwheel, and we also need -- I assume we're going to get in the USR, Bryan, the information on the bias in tagging using fishwheels and then the tag effects from the radio tags themselves. Is that correct that will be presented in the USR?

MR. NASS: The information that's -- check, check, check. There we go. The information, that's in the ISR and we'll continue to move forward into the 2014 report [to] include those analyses of what we look for in bias, things like that associated with fishwheels. So does that answer your question? We're going to continue to do those analyses.

MS. WALKER: Yeah (affirmative), that effect, as well as tag effect, but the reason, just to answer your question more...

MR. NASS: Tag effect, okay.

MS. WALKER: Yeah (affirmative), tag effect, there certainly is a tag effect on a gastric tag on fish that are swimming through a classified, plus rapids and moving 100 miles upstream. That should be addressed.

MR. NASS: Okay, I'll take that.

MS. WALKER: That's pretty standard. The reason given for not putting the fishwheel at Devils Canyon was the lack of the access, and we know that issue has been resolved, and that it's -- there's no restriction on placing that fishwheel at that location now.

We believe that additional tags from the Curry fishwheel, while it's good we have fishwheels on both sides of the river, most of those fish are going into Indian River. They're not moving upstream. We need more fish move -- that are more likely to be passing upstream. We need to get a better handle on the numbers of fish that are moving upstream, as how much -- and earlier, you know, we can look at the low return of Chinooks that we have right now and we can look at the Chinook returns from the 80's and get an estimate of the range of fish that are expected to move upstream.

That's all information we need in order to make our very important decision

on prescribing fish passage. I know you wouldn't want us to make that decision with a lack of information.

MR. NASS: I believe there's some information in the ISR that addresses this particular aspect of actually why we believe it's even better to put tags on at Curry than it is to run a fishwheel operation at the base of Devils Canyon and apply tags there. We'll also provide a response, written, to this, as well, and so without going into the details, it's AEA's position, still based on the work that we've done, that Curry was an appropriate place to put on tags to look at their distribution and that we did everything we could, really, to increase the number of tags that were going over Devils Canyon, through Devils Canyon.

MR. RUGGERONE: I'm Greg Ruggerone with NRC, working with the services. I didn't review this report, but just looking at your limited presentation here, was curious as to whether holding areas were examined and identified. This is an important question, because power peaking flows will potentially impact the holding of salmon in the Middle River, for example, and impact their access to those tributaries that they're heading up to spawn. So I was just wondering if you've identified those holding areas and made any observations on how flow levels have

impacted holding of salmon in the mainstem?

MR. NASS: Thank you. The question is regarding holding areas. I can't say anything really detailed about the Lower River, but within the Middle River, certainly, you know, that was one of the -- that's one of the emphasis of the aerial telemetry program is to have a really good read on where the tags are, kind of almost in real-time, and so it's very typical that we would see fish congregating in certain holds along the river, and most certainly, at the mouths, as we have come to expect.

So in that regard, we do have data that would lend itself to examining holding areas. In general, [that portion of the river is really a] migration corridor, and what we've seen in the timing of salmon from the point at which they're tagged, to the point at which they reach their destination tributary and then migrate upstream, it's a relatively short period of time.

We're just talking a couple of days to go from Curry to, for example, the mouth of Indian or Portage. So there's not a heck of a lot of holding going on in that stretch of the river, per se. That isn't necessarily the case, for example, on sockeye, which will go to sloughs, and therefore, you are in mainstem habitats. So it's species dependent, but I would say that yes the data exists for us to talk more about that type



of residence time, that's what we were calling it.

MR. RUGGERONE: And one other comment about fish migrating up through Devils Canyon. Hal mentioned the low abundance of Chinook salmon that's been present in recent years. Another factor that might contribute to that is the fact that throughout the state of Alaska, the age of maturation of Chinook has declined. They're much younger fish coming back. Therefore, they're smaller, and it may be the larger, older Chinook that might typically move upstream through a difficult passage area like Devils Canyon.

MR. NASS: Is that a comment [or a question]?

MR. RUGGERONE: Yeah (affirmative), it's a comment that maybe you're not finding a lot of Chinook today passing up through Devils Canyon, but in...

MR. NASS: Okay, I'll just point out two things.

MR. RUGGERONE: ...periods when they're...

MR. NASS: One, we did see the -- we started tagging in 2013, small sized Chinook, because there was such an abundance of them. Those are fish that we classify as less than 50 centimeters, and we did that in 2014, as well, because we wanted to have an idea, also, about their distribution, and so we adjusted tag sizes in

the rest of it to try to get more representative, if you will.

MS. DARA GLASS: (Indiscernible - interference with speaker-phone).

MR. PADULA: Does someone on the phone have a comment?

MR. NASS: I'm sorry, but I lost track of the second point, because I did have an answer for it.

MS. DARA GLASS: (Indiscernible - interference with speaker-phone), Jan's on the here now.

MR. PADULA: Okay, Jan, I'm glad you're there.

MS. DARA GLASS: (Indiscernible - interference with speaker-phone) you've got to yell.

MR. PADULA: Jan, I'm glad you're there. Just hang on one second and we're going to finish one comment here and then you're next.

MR. RUGGERONE: Age of maturation, older fish potentially making it up, maybe you looked at that question, if we were (indiscernible - speaking simultaneously) fish...

MR. NASS: Well, we certainly have looked at, for the purposes of the ISR, the 2012 report, we've definitely looked at the length of the fish that have ascended

through Devils Canyon, and there's still some more analysis to be done that, but that data exists.

MR. PADULA: Okay, Jan, we're all going to be really quiet here in the room. So please make your comment or question.

MR. KONIGSBERG: (Indiscernible - interference with speaker-phone) let's go back to 9.6 (indiscernible - interference with speaker-phone) whether or not the data (indiscernible - interference with speaker-phone) the proportion of (indiscernible - interference with speaker-phone) out of the tributary into the mainstem (indiscernible - interference with speaker-phone) we have new information about that (indiscernible - interference with speaker-phone) in the mainstem (indiscernible - interference with speaker-phone).

MS. KEEFE: Jan, this is Marylou Keefe. We don't have the data to evaluate the proportions of out-migrants versus proportion of juveniles remaining in the tributaries. That's not part of the objective of 9.6.

MR. KONIGSBERG: (Indiscernible - interference with speaker-phone) can you say that again?

MS. KEEFE: What I said is that the objectives for study 9.6 do not include a

component of estimating the number of out-migrants from the tributaries. So we don't have any data that would address your question on the proportion of juvenile out-migrants that remain in the tributaries versus migrate out into the mainstem.

MR. KONIGSBERG: Okay.

MR. PADULA: Thanks, Jan. Any comments on (indiscernible - distance from microphone)?

UNIDENTIFIED SPEAKER: For Bryan (indiscernible - distance from microphone).

MR. GEIGER: Yeah (affirmative), it's Hal Geiger again, then. I did want to ask some questions about objective six. So as I went through that, the term count was used often, but I got the feeling that the intent was to -- more along the lines of the word estimates. Then when I looked at the methods, they were very algebraic, rather than statistical. So I don't want to just sound like a broken record, but it's -- I thought there really needed to be some analysis of sampling error in that. Is that something that you intend to get back to?

MS. KEEFE: Bryan, could you put objective six up on the overhead? Okay.

MR. NASS: Yeah (affirmative), the primary purpose of generating counts of

Chinook in destination tributaries, their homing area, is primarily for obtaining a mark rate information. So if we're applying X-number of tags at a fishwheel and we get a certain proportion of those tags at a weir, then that gives us an indication of what proportion of the population we're tagging and gives us a handle on the order of magnitude of that population.

Of course, that also -- those sites are there to collect that morphological information that allows us to do some of the analyses to test the various assumptions that are used in [evaluating] recapture models and as fishwheels as a tool, themselves.

So again, if we have not provided a sampling error analysis that you're talking about in the ISR, then we would be happy to look at what specifically that would include, what would we need to do in order to get that to where you want it to be, what you're looking for. So I think that we're going to need clarification, eventually, on what specifically that is.

MR. PADULA: Jeff.

MR. DAVIS: Just a couple of quick questions while you're there. The 2012 study, the -- you talked about the portion of Lower River fish that moved into

tributaries. In 2012, the Yentna, the Talkeetna, and Chulitna were all considered tributaries in that analysis. Was that the case still?

MR. NASS: Yes, that is the case. They are tributaries.

MR. DAVIS: Okay, so when you look at the portion of mainstem spawning to tributary spawning, those fish are considered tributary spawners that move into the Yentna, the Chulitna, or Talkeetna?

MR. NASS: That is the case.

MR. DAVIS: Okay, in the 1980's Lower/Middle River tributaries, Chase Creek, MacKenzie, Dash Creek, had, well, relatively higher abundance of Coho spawners than other tributaries in the Middle River. How many tagged Coho moved into those Lower/Middle River tributaries?

MR. NASS: I don't have those numbers off the top of my head. Are you talking about 2012, just 2012 data?

MR. DAVIS: How many years did you tag Coho? So for both years.

MR. NASS: Okay, I would have to get back to you on that. I do not have that number off the top of my head, the number of Coho that went into that particular tributary.

MR. DAVIS: Do you know, in just general, the portion of Coho that were tracked to Lower/Middle River tributaries versus sites above the Curry tagging location?

MR. NASS: If I understand your question correctly, then this figure here is general classification of tag releases in the Lower River. So that's at river mile 30, and so ADF&G tagged Chinook, pink, and Coho, and so for Coho, and I'm probably going to be guessing here of what the proportion is, but let's just say that it's 5% went to the mainstem and the rest were tracked to tributaries, and so is that getting at it?

MR. DAVIS: No.

MR. NASS: Okay.

MR. DAVIS: The portion of Coho that moved to the Middle River, what portion spawned in Lower/Middle River tributaries versus sites above the tagging location.

MR. NASS: It's a good question. I know I have that, but I don't have it on me.

MR. DAVIS: Okay, just the reason I ask, is that was one of the comments

that the services had in the RSP that was supposed to be addressed within the initial study report.

MR. NASS: I can give you an approximation that it's typically around 5%. They've been tagged in the Lower River, about 5% will go to the Middle River.

MR. RUGGERONE: I am reviewing the...

MR. PADULA: Please identify yourself.

MR. RUGGERONE: Greg Ruggerone with NRC, working with the services. I am reviewing Study 9.12, which is fish passage into tributaries, and so I'm wondering, in that report, there was no mention at all, of any of the data that you've been collecting on adults moving into tributaries in relation to fish barriers in those tributaries.

So I'm wondering if you're integrating your work with Study 9.12 and when that would be incorporated into that fish passage study?

MR. NASS: Certainly, the question is, are barriers related back into our study, and the answer is yes, in that we are aware of where there are barriers, and on those systems that have barriers that have adult salmon, we would survey during our aerial telemetry surveys, at least to that point, and so we would be capturing the



entire area of that tributary that salmon had access to or adults.

MR. RUGGERONE: Okay, and will that information be passed onto the people that are writing up the 9.12 study, looking at barriers?

MR. NASS: Yes, there's an exchange of information that if passage -- if the passage group is looking for particular information that comes out of 9.7, then we would certainly provide that.

UNIDENTIFIED SPEAKER: (indiscernible - distance from microphone)  
9.12 (indiscernible - distance from microphone).

MR. WOOD: This is Mike Wood, again, from the Susitna River. The question I have is, how confident, in 2013, not just Bryan, but the other folks, they were that given the conditions of the river in 2013, with breakup and two huge flooding events, that the equipment was deployed in time to actually catch the fish that we're talking about here, because I know it was a really challenging year for you guys and it's my -- so I guess my question is, is there a number of (indiscernible - distance from microphone) or whatever, or times at which these funnel traps and wheels were actually deployed so you can get an idea of how much time we were actually collecting data?

MR. NASS: The question, I believe, Mike, is regarding effort relative to run timing, and the answer is yes, we very specifically tracked that kind of information, the number of hours fished, and the start and stop times.

In addition, in particular in the Middle River at Fish Wheel 1, we also run multi-beam sonar and we do that before we even get the wheels running, so that we can understand whether or not we are potentially missing some group of passing fish.

We also used that same concept in September, relative to Coho, so Chinook on the front end, Coho on the back end, and so in September, we'd run the ARIS system all the way through September, as was requested by FERC, so that when we reached that point in the first or second week of September when fishwheels are no longer effective, that being turbidity decreases, the water clears up, fish see them, they go around them, our capture efficiency plummets, okay, so we're able to have a pretty good idea of what's going by before we start our operation and after, and that analysis is in the ISR. Does that answer your question, Mike?

MR. WOOD: Yes.

MR. NASS: Thank you.

MR. PADULA: Anyone else or anyone on the phone have any questions or comments on this study? Anything else, folks?

MR. DYOK: Well, Steven, since NMFS said that they needed more time for discussion, we can go back for 20 minutes and bring up any other issues.

MR. PADULA: Well, again, we're -- we just want to make lunch a little longer and they can utilize a longer lunch for talking.

MR. DYOK: Well, I'd rather make sure we get on the table that -- any issues that they have, that we can then reflect on. Do you want to put 9.5 back up? Sorry, Marylou, to put you back on the spot.

MS. KEEFE: I already had my cup of coffee. It's dangerous now.

MR. PADULA: We did get some 9.5's that kind of came in and 9.6. So I guess the question is, folks, who -- Jeff, do you have -- do you want to go back to 9.5?

MS. WALKER: We're discussing that right now.

MR. PADULA: Okay.

MR. DAVIS: I guess since given this time, I would like to ask Jan if he's -- from the comment he made, if he's suggesting a study modification to develop an

objective to determine the portion of Chinook that are more likely to be subject to project effects by moving into the mainstem versus staying in the tributaries to overwinter.

MR. PADULA: Make sure Jan's there.

MR. DAVIS: He's probably got to take it off mute. In any event, I think it's a worthwhile point to consider.

MR. PADULA: Jan, are you still online, Jan?

MR. KONIGSBERG: I am here, but (indiscernible - interference with speaker-phone).

MR. PADULA: You'll have to really speak up. Did you hear Jeff's comment?

MR. KONIGSBERG: What, no.

MR. PADULA: Try it again. Listen closely.

MR. DAVIS: Sure, Jan, I was wondering if you were going to suggest a study modification to look at the portion of Chinook that stayed in tributaries versus that portion that moved into the mainstem in order to evaluate the relative project effects on Chinook, there being potentially greater effects to those fish that are moving

down and overwintering in the mainstem versus those that are staying in the tributaries.

MR. KONIGSBERG: Jeff, I think I heard you. Yeah (affirmative), I would -- yeah (affirmative), I would -- I think what (indiscernible - interference with speaker-phone) standpoint, not that we don't know the percentage of juveniles from a particular tributary, whether they're Coho or Chinook that stayed in the tributary until they smolt, then we're not going to know the impact of the project on relative salmon abundance year-to-year (indiscernible - interference with speaker-phone) assuming that the project increases the mortality on fry and juveniles that are in the mainstem, depending on the project operations mode, particularly low (indiscernible - interference with speaker-phone).

In other words, if [80] percent of the juvenile or fry stay in a tributary until they smolt, my assumption would be they're going to have (indiscernible - interference with speaker-phone) because they're not affected by [Project] operations until they smolt and then that points me to (indiscernible - interference with speaker-phone) in the mainstem, than it would be to the (indiscernible - interference with speaker-phone). Do you get my point?

MR. DAVIS: Thanks. It sounds like a good hypothesis.

MR. KONIGSBERG: Did you hear me?

MR. PADULA: Yes, thank you. Yes, Jan, thank you. We heard you loud and clear.

MS. O'NEIL: This is Sarah O'Neil. I'm consulting for Trout Unlimited and I have just a couple of comments. One is that relative to fish distribution and abundance, the way it's being reported with different units for CPUE, it seems reasonable to me to do some exercises in calibration between methods, so that is -- so the data is more comparable, so that you can lump it together like it is currently being pooled, and the other is that given some of these issues, and this has been stated already by the services, but I'd just like to emphasize that given the limitations of the 2013 data, we just don't think it's possible to meet the objectives without two years of additional sampling.

MR. PADULA: Any other desire to go back to details on 9.5 or being -- or you were cut short on (indiscernible - distance from microphone)?

MS. WALKER: Just one thing I'd like to say, especially to Bryan, is that it's often hard to hear these questions and they come across as being critical, but there

are many studies that we've reviewed that we really admire the way they were designed and conducted and this radio tagging study was certainly one of them, so thank you.

MR. PADULA: Anybody else? Anybody else on the phone? We're at a quarter to 12. It will be a challenge if we move up all of the afternoon. We'll have to check with all of our presenters.

MR. DYOK: No, don't, keep to the schedule.

UNIDENTIFIED SPEAKER: No, we're not moving.

MR. PADULA: Do you (indiscernible - speaking simultaneously) and so people have a slightly longer lunch break and maybe you can get out and (indiscernible - distance from microphone) a little bit and utilize some additional time in your own conferences and we will start back up on...

MS. LANCE: Can I make a real quick announcement, please? For the folks, the services consultants, we have a table reserved down in the restaurant and so we can go ahead and meet down there.

MR. PADULA: Thanks. So folks, I'm (indiscernible - distance from microphone) we reconvene at 1:00.

11:46:18

(Off record)

(On record)

12:59:43

### **RIVER PRODUCTIVITY STUDY (STUDY 9.8)**

MR. PADULA: Welcome back to the afternoon session of the Day One. We are on schedule with the 1:00 agenda item, which is River Productivity. Tim Nightengale is going to cover the presentation from phone. Marylouise is going to drive the slides and we'll see how this goes, works from here, hopefully, and again, we're going to go rather quickly through the presentation and maximize time for discussion. So with that, Tim and Marylou, it's all yours.

MR. NIGHTENGALE: (Indiscernible - interference with speaker-phone) so we're going to do the River Productivity Study (indiscernible - interference with speaker-phone) for that. We're going to do the goal of this is basically to update the baseline data to assist in evaluating the effects of [the Project-induced changes] in flow and other variables on the benthic macroinvertebrates and algal communities in [the Middle] and [Lower Susitna River].



The 2013 field season required a number of changes to meet our study objectives. This is all detailed as variances in the ISR in Section 4. Most of our variances were the result of adjustments due to field conditions or methodologies that didn't work [as intended].

For example, for field conditions, we had [a late ice breakup] in 2013, which was followed by extremely high, record temperatures that resulted in some high fluctuating flows on the shoreline where we were sampling, which made it really difficult to find sampling locations that were consistently inundated for the prior 30 days.

[Regarding changing methodology, for plankton tows] were initially recommended at 11 of our sites, we opted to [sample with those at sites where drift samples were not possible]. What we know now was that in some still water areas that we had, which was a couple of sloughs, we couldn't use [the drift nets to sample those areas. What we did was standardize the approach, so the sites to use a plankton tow] was anywhere where the flows were not suitable for drift samples as [a method]. [The FERC SPD indicated a possible 11 sites with still water, but those conditions were consistently located at the five upland sloughs.] So adjustments like

that.

Next slide. Other variances or adjustments were related to [the needs of the trophic] analysis components. For example, one of the major ones was that in the original -- original plan was that we were going to select two stations with three sites each, that was six sites were proposed for stable isotope analysis.

This was after some consultations and TWG meetings. We eventually arrived at sampling 16 of our 20 sites on four different stations or focus areas.

Next slide. I'll run through this and talk about our modifications. So for the modifications, many of these are proposed in the ISR, just continuations of the adjustments that we made in the field in 2013 of variances.

One of these includes site relocations due to access issues or [lack of site] overlap with some [other study efforts] at that time or the modified (indiscernible - interference with speaker-phone) collection of (indiscernible - interference with speaker-phone) like I indicated earlier.

Next slide. So one of our proposed modifications deals with the deployment of our [adult emergence] traps that we had set up. During 2013, we had difficulties having bears leave these alone, and also they were being [disturbed by boat traffic

and] a lot of floating debris was taking them out.

So our modifications for next year would be to increase their floating and the flotations for that [to keep them from sinking], figuring out better ways of anchoring and deploying those so that they are not as disturbed or as easily taken out by boats. So that is one example of a modification that [we are proposing].

Next slide. We also will continue this increased sampling regime for the stable isotope analysis, using the full 16 sites. We also have suggested adding Arctic grayling as a target species. This is to address the lack of target fish species that we collected above Devils Canyon that are two focus areas up there.

Also, adding that in would augment the fish collection numbers at all sites for our stable isotope analysis and our fish diet [collections].

Next. Another modification deals with our [colonization rate study] and we use [where we used multiple sets of Hester-Dendy samplers deployed over an 8-week period]. We had set them up to be at different turbidity and temperature conditions, but set up [two depths, shallow and deep] conditions to deployment them at.

What we found was that as you put them in turbid waters that are warm or

cold, we also had a depth variable and it was very hard to match temperature and turbidity and yet keep [to two different] depths without them being exposed. So we were -- we are proposing that this just be changed to put them in the five macrohabitats as they [were already deployed within FA-104 at four macrohabitats] and then this adds basically one [additional] slough site to the sampling efforts that we did in 2013.

We would also add in an extra set of Hester-Dendy samplers on the main channel to try to track and figure out what the effect is on the fluctuating shorelines that we experienced [investigate fluctuating flow levels and how colonization] shorelines that we experienced in 2013.

Lastly, we had a proposal, which we had proposed to do an additional effort where we would sample a select number of tributaries and lakes [located] above Devils Canyon in order to examine the pre-project conditions into the system. This was conducted in 2014, as well.

For our current status, in 2014, are we going to do that?

MS. KEEFE: No, we're going to right to questions and comments at this point in time. Tim, if we need to go back to 2014 slides, we can do that with the -- during

the discussion.

MR. NIGHTENGALE: All right. So I guess we're done.

MR. PADULA: Anyone want to start us off?

MR. MERZ: Sure, can you hear me okay?

UNIDENTIFIED SPEAKER: Mm-hmm (affirmative).

MR. MERZ: Excellent. I'm Joe Merz with Cramer Fish Sciences and first off, I want to commend the group, a lot of information being collected and looking at the 2013 preliminary report, the background research was awesome, great literature search.

MR. NIGHTENGALE: Thank you.

MR. MERZ: You bet, and I also understand, you know, being someone who works quite a bit with invertebrates and primary productivity, getting samples completed under that insane timeline, you know, I have to say, we have very little information to look at from results, but we understand, considering the timeline.

A couple of thoughts here, specifically, the emphasis on benthic sampling, benthic algae, benthic macroinvertebrates, we know that off-channel habitat doesn't just have benthic production. It also has a water column production. So organisms

that actually live up in the water column, that's what they do for a living, and it really, I think it -- focusing only on the benthos, just really seems to really reduce the ability to look at productivity, especially in these off-channel areas, where we assume water quality is -- turbidity, for instance, sediment will settle out, longer residence time of water, therefore better or increased productivity, that needs to be -- that needs to be looked at.

A couple of other thoughts here, and again, unfortunately I'm going to focus on things that I found lacking. There were many things that were positive, but with limited time, I'm going to focus on things that I found lacking.

The (indiscernible - microphone distortion) assessment, looking at daily sampling, again, the crew is under again an insane schedule to get things done. So for instance, if you're going to take stomach samples or drift samples, especially, if you start at one location in the morning and you finish up at the end of the day, you could potentially be comparing apples to oranges, as far as metabolism, and then organisms that are up in the drift when fish are feeding, so that is potentially a problem.

Looking at production, especially organisms that are in the water column, we

know from numerous different (indiscernible - microphone distortion) systems, I don't know the crews, the folks that are working on this know this too, but I need to bring it up, there is a seasonal pattern that goes beyond just sampling three times a year.

Phytoplankton, zooplankton, have monthly, weekly changes that happen, and the snapshot of times really removes the ability to assess the seasonal pattern or fluctuation that potentially could happen in this system, especially in talking about main channel versus off-channel habitat and production.

Sample size, there's lots of discussion about how many stomachs would be taken and again, I realize, being cognizant of the amount of money it costs to do field work, and but what about minimum sample size? There were stomachs that had been taken historically. There were stomachs that had been taking in 2013, perhaps doing a calculation of increased number of potential (indiscernible - microphone distortion) for instance, and stomachs, that should figure out when that (indiscernible - microphone distortion) to kind of get a story of how many stomachs need to be taken to get a picture in time of what fish are eating, would be important, and please, I'm rattling things off here. If you'd like to stop and discuss any one of

these subjects, I'm willing. I'm totally happy to stop at that point.

Some of the techniques seemed to have driven the samples that would be taken, where sampling would occur. So for instance, soft bottom sampling in off-channel habitats, any type of benthic sampling, for instance, something on a piece of equipment like a Hess sampler that requires flow to move organisms into the sampler, that just simply doesn't work in a soft bottomed area, especially in a place that has low or negligible flow, and so that says to me that trying to pick one sampling method for the benthos is an issue and needs to be looked at.

Other key things here, the -- it seems to me a story of what the food web is, how it functions, where is the -- where are the fish getting food from? For instance, the preliminary step does suggest zooplankton's in the stomachs of these fish. Where's it coming from? When does it happen? When does it pulse? Those are important questions that to lay the groundwork of how this potential project, may it change, not only productivity, but the timing of that productivity, because one of the biggest concerns can be, with regulation, a decoupling of the food web from the key organisms, the umbrella species that we're interested in, and so getting a better picture of how the food web functions to then inform when and how sampling is



going to occur, needs to happen, and I get, I know I'm throwing out some very big things that suggest lots of more sampling.

It doesn't necessarily have to be that way. For instance, putting in automated samplers to look at phytoplankton, chlorophyll A in a water column that could actually sample water on a seasonal timing without necessarily having to have crews out there manning that equipment or operating that equipment, would be one way to work around that.

MS. KEEFE: So I don't know if Tim and Erik -- I don't know if you were able to write that list down or...

MR. NIGHTENGALE: Well, I could hear some of it. The quality of the phone is not perfect, but I was gathering what he was saying. It would be nice to have that list.

MS. KEEFE: Kai has it. If you want her to read it...

MR. NIGHTENGALE: [First thing,] he talked about sampling [invertebrates on] soft bottoms with [something other than a Hess]. We do use a [petite Ponar grab sampler] in all off-channel habitats. So we do have a variety of methods that we do use to sample. We sample in drift. We use plankton [tow nets]. We use the [drift

nets in flowing water] areas and then in off-channels, we use the [plankton tows]. So we [use appropriate sampling devices because we know substrates with a] soft bottom definitely will [have different invertebrates]. That's true.

MS. KEEFE: Tim, Kai can read them back to you, if you want, and we can address one at a time, if that's okay?

MS. STEIMLE: Okay, or you can correct me if I don't paraphrase...

MR. MERZ: Sure.

MS. STEIMLE: So I think...

MS. KEEFE: Kai, you're going to need the microphone, I think.

MS. STEIMLE: Okay, Tim, can you hear me, maybe?

MR. NIGHTENGALE: Yes.

MS. STEIMLE: I think the first point was the relative emphasis on benthic production versus water column productivity in the study design.

MR. NIGHTENGALE: (Indiscernible - interference with speaker-phone) so we do take drift -- I mean there are drift samples taken at [each] site and if there's not enough flow, like I said, we used the plankton tow, as well, but we do [employ several methods that are] I mean, we are taking things from the water.

I did hear the talking about times of day with drift samples and it doesn't always (indiscernible - interference with speaker-phone) drift has peaks during dusk and dawn and at midnight. The issue is that during the summer, it really is a very small window of [time without] daylight. We looked [through the literature] and decided that there was evidence there that there wasn't that kind of [drift behavior] when we have very little daylight or very little nighttime, when you have these extended daylight periods. I think the Müller [paper] was the one that I was looking at for that in Alaska, but we do acknowledge, we are taking stuff from the water column. I mean, that's -- there are examples of (indiscernible - interference with speaker-phone) those do have substantial amounts of sampling that we're taking at every site.

MR. MERZ: Tim, yeah (affirmative), this is Joe again. I know that you were under some very intense timelines to sample such a big area and I hand it to you for being able to cover the area that you did, but you know, periodicity in drift isn't just related to time of the day, it also is related to fluctuations in turbidity, flow, even predation rates, so temperature fluctuations, as well, and I know you know this, but those weren't necessarily discussed in the draft. So that's the reason why I brought

them up.

MR. NIGHTENGALE: Well, yes (indiscernible - interference with speaker-phone).

MS. STEIMLE: Should we keep going with the list, so that -- the next issue that came up was addressing the seasonal pattern of sampling with the three times a year schedule for the sampling that was completed.

MR. NIGHTENGALE: Okay, yeah (affirmative), we have a pretty short season, especially when we're waiting for the flows to -- the ice to melt and the flows to come down. They kind of -- the way it worked out is we were sort on a six-week sampling cycle, taking them in early mid-June, and then turning around and doing it again in early August, and then turning around and doing it again in mid-September.

So I mean, we kind of -- the way it worked out was -- it's a little over -- a little over four weeks, I mean, six weeks is a fair [estimate of] what the time was between sampling events. Certainly, you know, [monthly sampling is] nice, but that also increases the number of samples we're taking.

MR. MERZ: Yeah (affirmative), so that -- again, that brings up the idea of

sampling design versus your crews' ability with the folks you've got and just basically got that intense schedule, so yeah (affirmative).

MS. STEIMLE: The next item I had on my list was looking at the accumulation of species in the diets, using historic stomach samples to look at appropriate sample sizes for stomach collection.

MR. NIGHTENGALE: Okay, I think [that was detailed in] our study plan, we had set up that we would take up to eight, if available, on a stomach per target species. For 2013, the numbers were lower than what we had anticipated or had wished for.

That is a function of them not being necessarily available and I think the habitat also -- there was an issue with coordinating efforts with fish crews being able to sample in the same timeline at the same sites. We did have a lot of site overlap, but the -- yeah (affirmative), the sample -- the sample size was 261.

If you go to -- let's go to the, let's see, I think we need to go to the results of 2014, and talk about how we approached this. In 2014, we stepped up our fish collection efforts by having a dedicated crew that accompanied the RivPro team.

Our focus for 2014 was largely to support UAF's ability to complete their

trophic modeling as to [collecting tissues and materials] analysis, since they are on a two-year grant and needed to finish this up this year.

Very [similar sampling goals and the methods] were the same as 2013, in terms of what they needed to do with their sites. They went -- they visited all 21 sites -- the dedicated fish team along with them. We did add Arctic grayling as a target species to collect. So if you put this in the context of how this improved -- so in 2013, for spring, we collected 63 target fish species.

In the spring of 2014, we collected 129. So we literally doubled what we did in the spring [and] now that we're finished and we sat down and tallied up all of our initial estimates, for 2014, we collected 450 target fish species total, of individuals for this stable isotope and fish diet analysis.

So all those fish had their stomachs pumped, a fin clipped for stable isotopes and scales taken for the growth analysis for the -- for UAF's trophic modeling. So that 450 compared to [fish collection total for] last year, which was 261, it was substantially better [a more coordinated] effort because we dedicated a group [that was dedicated] to sampling on-the-ground with the [RivPro crew, which turned out] much better.

MR. MERZ: Tim, that sounds awesome, but again, you know, increasing effort, I know you also need to be efficient in the work that you do and again, getting an idea of how many samples per stomach you need, what if it's only five that you need to actually, you know, the diet is that simple, getting that idea of where the stomachs plateau out will actually, I think, help inform you on where you need to be, whether it's higher or lower than the effort, and then I'll have to say the intense effort that you've had to put in so far.

MR. NIGHTENGALE: Okay, yeah (affirmative), it's noted. Thank you.

MS. STEIMLE: The next comment, which you may have already talked about a bit, was the use of techniques in different sampling locations, particularly the soft bottom...

MR. NIGHTENGALE: (Indiscernible - interference with speaker-phone).

MS. STEIMLE: Sorry, Tim, is that any better?

MR. NIGHTENGALE: Yes, we can hear you now.

MS. STEIMLE: Okay, the next issue is the use of different sampling techniques in different habitats, particularly soft bottom, off-channel habitats, and you may have addressed this a little bit already, but...

MR. NIGHTENGALE: Right, (indiscernible - speaking simultaneously) I think I dealt with that one, with the [Ponar sampling].

MS. STEIMLE: Okay.

MR. NIGHTENGALE: But I'm curious, that was not the answer we were looking for here.

MR. MERZ: Tim, that is from the 2013 report, the way I read it, it looked like because of one of the sampling methods not working in softer substrate was the substrate being too deep, that you then shifted to another habitat, an area that was more (indiscernible - microphone distortion) like with a closer bottom to sample, and that just put up a red flag for me about sampling, making sure that the technique is correct for the habitats that need to be sampled versus fitting the habitats to meet the technique.

MR. NIGHTENGALE: Right. Yeah (affirmative), I mean, the [Ponar grabs] were mostly taken -- upland sloughs really had no flow and so Ponars [those grabs] were taken in those habitats pretty much exclusively.

Some of our side sloughs also, when they were cut off, and the flows were down, we also would, if there were still water areas in that, in addition to swift water



areas, we actually sampled them both. So I know at FA-173 in a side slough, we had a slower water area where plankton tows and Ponars are taken and then in the [faster, flowing areas] we were doing -- setting up our drift sampling, the Hess samples, as well. Those were both available.

MS. STEIMLE: Okay, I think the final comment was a general comment about a study's ability to characterize the food web at a broad level, and the example mentioned was zooplankton in the fish stomachs.

MR. NIGHTENGALE: (Indiscernible - interference with speaker-phone) so we have addressed this. I think we get a better picture of it when we actually had the data available to us. So in the technical memo that we put out, we do describe a lot of that. We did find that zooplankton was more prevalent back in the slow water upland slough areas far more than anywhere else, even though we did see them a little bit in [other slow water areas besides] in the upland waters. Usually the uplands don't [have much for drifting invertebrates], you know, each site kind of tells a story and I think that our data is approaching that very well.

I don't -- I agree with you, you know, I -- when I look at data, I want it to tell me what's going on and why. So I think as we get more of this data together and

we're able to analyze it more, get a clearer picture of what we actually collected and how it looks. I think that picture, that story will come out, but I would say, you know, let's look at the -- our technical memo that we just put out and see if that -- that does the trick.

MS. KEEFE: Yeah (affirmative), so that's something that -- my mic's not working. So I'll yell. That's something that I think we can discuss in January, after you have a chance to review those tech memos.

MR. NIGHTENGALE: (Indiscernible - speaking simultaneously).

MR. MERZ: Awesome. Yeah (affirmative), thanks for the time on that. Two other quick points I wanted to bring up. One is the concept of invasive species. I highly suggest that the -- we look into the -- reservoirs are a known for creating invasive species problems. In vertebrates, bivalves, predators and their change on the food web, and I think, you know, the fact that there are folks out now from other areas going into this area, alone with their equipment, and listen, I don't want to question people. I'm sure people are being very careful about how they're sampling, but the idea of invasive species and what could potentially happen, not only from going in and doing intense sampling, but the alteration of the habitat needs, needs to

be brought up, and then one last little point on here -- big point on here, is the idea of the fresh water plume, not the clear water plume, but the idea of the change in the hydrograph on how nutrients carried out of the system and the fresh water moving out into the bay will influence, for instance, juvenile salmonid production and how juveniles behave and how they move out of the system and how they feed out there and utilize that area for cover and so forth, in turn, influencing returning nutrients later.

MS. KEEFE: Thanks.

MR. PADULA: Thanks, Joe. Thanks, Tim.

MR. NIGHTENGALE: (Indiscernible - interference with speaker-phone).

MS. KEEFE: Anybody else...

MR. PADULA: (Indiscernible - speaking simultaneously).

MR. DAVIS: Yeah (affirmative), I've got a few things. I'll take the whole stand.

MR. MERZ: You'll take the whole stand.

MR. PADULA: Jeff is getting the microphone.

UNIDENTIFIED SPEAKER: That mic is on. The mic is on.

MR. DAVIS: Yeah (affirmative), I wanted to just touch on some of the study modifications that you brought up. You proposed moving the Trapper Creek site, or you did actually move the Trapper Creek site to Montana Creek, and I think that an additional sampling location and focus area within the Middle River would be much more beneficial, particularly slough 128, since there's a lot of other studies that have gone on there.

There's only one, this -- either Montana or Trapper, only has one Lower River site, which really isn't enough to characterize the Lower River. If, indeed, we want to characterize the Lower River, then additional sites should be selected within the Lower River, but rather than just replace one Lower River site with another Lower River site, I think FA-128 would be a much better choice, particularly given the intensive effort that's gone on in that focus area, among all the other slough focus areas.

You had a proposed modification to replace an upland slough habitat in 173 with a tributary mouth, and I felt that upland sloughs were underrepresented, as it was, particularly in the selection of the Montana Creek site, which I'm not sure who...

MR. NIGHTENGALE: Can I address that?

MR. DAVIS: Well, no, I just want to get through -- I'm just trying to get through the list first, if I could, and then have you go back, if you don't mind?

MR. NIGHTENGALE: Okay.

MR. DAVIS: Particularly the Montana Creek upland slough site, which is, in fact, a relic channel of Montana Creek, and not really a flood plain channel, so that, and I think that we need more upland slough sites, rather than less upland slough sites.

You modified by moving the storm sampling to 173, instead of -- I'm thinking of the old terms, slough 21, but it seemed reasonable to do that. You had a modification to reduce the number of shoreline bathymetry measures and that seemed reasonable, as well, as long as you were continuing to take the measures where you collected the samples.

I will say, at that point, also though, that I continue to disagree with the use of a Hess sampler to select the mainstem, the sampling locations, mainly because the limitations on depth, which I felt created units having problems getting you guys having problems with getting out there and sampling with, you know, with allowing

the 30 days to have a site be inundated.

So just to reiterate the comments that were made on the RSP, in the revised study plan, sampling method appropriate for deep water habitats, it needs to be used instead of a Hess sampler.

FERC determination also talked about collecting algal samples at multiple depths, when you collected algal samples up to three feet, when you collected algal samples up to three feet, when you collected algal samples off the mouth of the server, the max depth I saw on your data was a foot-and-a-half.

I also disagree with not collecting algal samples from fine substrate within those habitat units where fine substrate is dominant. There are other methods available to collect fine -- algal from fine substrates, even if you can't get an intact Ponar dredge sample, which was stated as the problem that you had with doing that.

The modification to estimate dry weights for length relationship, I think that was part of the services RSP comments. Emergence trap modifications, it seemed reasonable to do the emergence traps among the different macrohabitats, as well as the Hester-Dendy traps among the different macrohabitats.

One thing that we noticed that you didn't do that was in the study

modification, one of the study modifications that was in the FERC determination was to collect a drift sample above and below tributaries to try and get a measure of the relative contributions of tributaries to drift, and that wasn't implemented, at least as stated in your ISR.

So you talk about the feasibility of Talkeetna reference sites. I noticed a little difference in this presentation, at least the one I looked at online, versus what was in the ISR, but I think the best thing to do for the Talkeetna reference sites is to get replication from all the different macrohabitats, not just three of them. So it should be mainstem, side channel, side slough, upland slough, and tributary mouth habitats.

So you increased the sites for the stable isotope analysis, but the services made comments on the locations for stable isotope analyses, and recommended that additional sites be selected within the Middle River, where it's more likely to have anadromous fish, and you selected sites without consultation with the services that were outside of the Middle River. So you selected an additional site in the Upper River above Devils Canyon, an additional site at Montana Creek, and that same comment applies to the growth rate analysis or the bioenergetic modeling, as well.

You culminated on not marking target fish species to get your growth rates to

calibrate or validate your bioenergetic model. That was a FERC determination to mark fish. I disagree with your basis for not doing that within the study. I that marking fish from a macrohabitat will at least allow you to identify those fish that were raised and grew within that habitat location.

You implemented a study modification to increase sampling in tributaries in the Upper River and the services comments have always been that the number of sampling sites within the Middle River was already underrepresented and there wasn't enough replication and so we think that effort should have been directed toward additional Middle River sampling sites, instead of Upper River sampling sites.

As far as the implementation of the 2013 studies, I think there were some problems with habitat classification that we can talk about under Section 9.9. I noticed that sampling occurred largely in tributaries and did not sample tributary mouths, that is, the tributary itself and the plume downstream in the mainstream, and I believe that's all the comments I have. Thanks.

MR. PADULA: So Tim, before you start your responses, I just want to check, does anybody else intending to provide substantial comments or questions on this



study? We'll try to do a little bit of a time check.

UNIDENTIFIED SPEAKER: (Indiscernible - distance from microphone).

MR. PADULA: Okay. All right, Tim, do you want to start? Do you need time to (indiscernible - speaking simultaneously)...

MR. NIGHTENGALE: (Indiscernible - speaking simultaneously).

MR. PADULA: Or did you (indiscernible - speaking simultaneously)...

MR. NIGHTENGALE: [I think I heard] most of them. The one that I wanted to -- wanted to get on was, he talked about at 173 that we put in an unmarked [tributary mouth as a] replacement of the upland slough. The reason the upland slough was not done is because it was on CIRWG land and we did not have access to that in 2013.

We did have access to it this year, and drift samples, plankton tows, the sampling was done and [so was fish sampling]. So that wasn't because we didn't want the upland slough. It was because we weren't allowed access to it and we wanted to basically notice that there was an additional trib mouth to add on and still keep our 20 sites. So now, we have 21 sites.

[He] also commented that we didn't take any drift samples [above tributary

mouths]. That's wrong. We did. We do have an extra site that's specifically above trib mouths that actually takes that, and the first -- the first [collection in June] determined were actually above the Indian River during the time the (indiscernible - interference with speaker-phone) actually had (indiscernible - interference with speaker-phone). It turned into a backwater, sort of eddy area, and it gave us absolutely no flow, so [future sampling was] relocated to the [area further up the] river, but we do have those upstream and downstream of the trib mouths.

MS. KEEFE: And Tim, were those reported in the ISR or in the TM filed in September?

MR. NIGHTENGALE: I believe we indicated in a list that it was like at site five, but it would be indicated in the [tables] and in the TM, as well.

MS. KEEFE: Okay.

MR. PADULA: Tim, at this time, any other responses to Jeff's comments at this time?

MR. NIGHTENGALE: There were a lot of [them].

MR. PADULA: Okay, can we (indiscernible - speaking simultaneously)?

MS. KEEFE: Is there anything...

MR. NIGHTENGALE: I would say that we did, for the algal samples in sediment, we actually did -- it was a slough, and that was in Talkeetna, on the Talkeetna, was -- had relatively no hard substrates at all [to collect from].

We had [some woody debris but had difficulty finding] much of any of that. Anything that was, like a piece of wood was discovered with sediment on it. We did go ahead and try the sediment technique of the algal sample [using the USGS method]. The results in the ISR do show that we have extremely off the chart. The results [for ash free dry mass were higher] simply because you're taking sediments from [the bottom that were largely organic matter]. So that was an outlier, in terms of that and so our concern is that to go ahead and do that (indiscernible - interference with speaker-phone) is the sediment samples, getting out the (indiscernible - interference with speaker-phone) sediment samples and [comparing it with] everything else.

I (indiscernible - interference with speaker-phone) into a hard substrate of some sort. We get that kind of -- we get more a [standardized approach]. It's basically [apples to apples type of comparisons]. That's all I can remember off the top of my head from my notes here. I'm certainly interested to...

MR. PADULA: (Indiscernible - speaking simultaneously)...

MR. NIGHTENGALE: ...get the full list and there is an opportunity...

MS. KEEFE: Well, I think -- is this on? Can you hear me?

UNIDENTIFIED SPEAKER: Yes.

MS. KEEFE: I think, you know, Tim, we do have the TM that was filed in September with the results from 2013. so in addition to just having the numbers of places you went to sample, I think it probably would be beneficial for you to look at the actual data from the lab and see how the results come out with the design that we have, and then we can have further discussion on this based on the results in January.

MR. DAVIS: I, you know, and I don't want to go back and forth at this meeting. So I'm not going to comment, except that I think that -- well, I'll just leave it at that. I'm not going to -- I don't think we can have an exchange, you know, in this amount of time to go back and forth on these comments, but I, you know, if a sample is not representative, that -- how -- that doesn't really matter what the data is.

If your sample is not collected to be representative of a location, then I don't see how looking at the data is going to really help you.

UNIDENTIFIED SPEAKER: How would you determine if your sample is representative, if not by looking at the data?

MR. DAVIS: Where it was collected and how it was collected.

MR. PADULA: Okay, Dudley, grab that microphone.

MR. REISER: Yes, I just wanted one second to comment, a follow-up to what Joe was talking about, because I thought it was good (indiscernible - speaking simultaneously)...

MR. PADULA: Get closer.

MR. REISER: On this idea, you know, invasive species, and just mention that we do have a protocol that we use, in place in terms of, you know, we do have field crews coming in and out, and we're aware of those issues, potential issues of invasive species.

So we do have protocol in place for equipment, et cetera, but I think that's a good point. I just wanted to bring -- to mention that we do have something in place.

MR. PADULA: Thanks, Dudley. Stormy, you say you have a couple of comments you want to make?

MR. HAUGHT: Yeah (affirmative), I'll keep it pretty short.

MR. PADULA: Stormy of Fish and Game.

MR. HAUGHT: Yeah (affirmative), Stormy of Fish and Game, I just had the same comment on the stomach content analysis there. It would be good to see some type of evaluation of the sample size adequacy, you know, added (indiscernible - interference with microphone) curves or something like that would be a way to do that. I would also like to see the proportion of empty stomachs recorded on that.

One thing that hasn't been brought up is that precondition Hester-Dendy's, I think you made the decision to move forward because this year, you weren't able to have the time to precondition them and used that justification to not do that in the future. I would like to see them preconditioned. I mean, I think that's the best way to resolve that.

The final thing that I have here, yeah (affirmative), just the Hess sampling, we've gone back and forth on this a lot in past meetings, and I think those Hess samplers are very limited in where you can use them in the mainstem and it would be good to have an alternative method to sample these habitats where the (indiscernible - voice lowered) of this collection data, and you don't really have to respond to most of those, because you already did.

MR. NIGHTENGALE: Okay, yeah (affirmative), I know we have this [as a variance due to] the limitations [with the delay with the samplers] that we got delivered and to the point where it would have been hard to place them in the river in conditioning and still like to pull off the experiment.

I know we have the [Hester-Dendy samplers now and] can probably end up getting more [earlier this time]. We [would be able to] do that. The trick will be to actually find the safe place to put them in the river where a bear won't run off with them or people, for that matter.

MR. PADULA: Okay, anyone else? We have a few more minutes on this topic, if anything came to mind during that discussion. I appreciate the detailed comments we're getting and we're getting those down so that folks like Tim, who are on the phone and somewhat of a disadvantage can give some thoughtful consideration, but I think we're probably ready to move on.

**CHARACTERIZATION AND MAPPING OF AQUATIC HABITATS (STUDY 9.9)**

MR. PADULA: The next study up is Characterization and Mapping of Aquatic Habitats, 9.9, and is Laurie on the phone?

UNIDENTIFIED SPEAKER: She should be.

MR. PADULA: Hi, Laurie, are you on the phone?

MS. MARCZAK: I am on the phone. Can you hear me?

MR. PADULA: Yes, thank you, loud and clear. Marylou's getting the presentation ready to go. Do you want her to...

MS. MARCZAK: Do you want me to start directly with the variances or do you want me to give an introductory [slide]?

MS. KEEFE: Yeah (affirmative), we'll start with the study name, and yeah (affirmative), give an introductory and then we'll go through it.

MS. MARCZAK: Sure, okay. So this is Study 9.9, Characterization and Mapping of Aquatic Habitats. My name is Laurie Marczak. I'm a (indiscernible - interference with speaker-phone) with R2. This study basically is very straight forward study where the aim was to -- the broad objective was to both characterize and map habitats in the Upper River, the Middle River, in mainstem, off-channel and tributary habitat.

Okay, so we had three variances. We had the same access limitations that were common across all of the studies. So [that was a] variance in 2013, but was



resolved in 2014, as a condition of our [land access].

The second variance was that we expanded the special habitat features, the category of special habitat features to include backwaters, beaver complexes, and clear water plumes, and then the final variance was that in 2013, the survey conditions, in terms of flow that [we] experienced on the ground were more variable [than anticipated] and a consequence of this was that some habitats were surveyed at flows higher than our targeted flows, but some preplanning enabled that to be restricted to habitats that [were less] sensitive to varying flows. The majority of (indiscernible - interference with speaker-phone) take place for (indiscernible - interference with speaker-phone).

The (indiscernible - interference with speaker-phone) again, it comes from that second variance I just described and that's at (indiscernible - interference with speaker-phone). The special habitat features includes backwaters, beaver complexes, and clear water plumes. Those are three habitat features that previously had been placed as macrohabitats in the [classification] structure for habitats that had been adopted and set up.

That change was in direct response to a FERC recommendation that [the

habitats: backwater, Clearwater plume and beaver complex that were then in] the category macrohabitats, and pushed down a level [to level 4] category, mesohabitats.

Then there was also a request to give particular [attention to] backwaters, which are special variations, and so we [decided to group] these -- all three of these into the category of special habitat features, basically to allow us to target and separate [these “new” mesohabitats] and give us a format in which to target them for survey. They were no longer macrohabitats and macrohabitat [was the scale of] the random habitat selection. That's it.

MR. GILMOUR: I have some comments.

MS. MARCZAK: And just so you know, I have been having a very hard time hearing folks (indiscernible - interference with speaker-phone).

UNIDENTIFIED SPEAKER: (Indiscernible - speaking simultaneously).

MR. PADULA: Yeah (affirmative), we'll get started right now.

MR. GILMOUR: Yeah (affirmative), hi, Laurie, this is George Gilmour. I'm commenting for the services.

MS. MARCZAK: (Indiscernible - interference with speaker-phone).

MR. GILMOUR: On the surface, you know aquatic habitat mapping seems

pretty basic. You get out in the field, pool or riffle glide, side channel, what have you, but in reality, it's very important. Habitat maps really serve as a template on which you analyze the effects of project alternatives on the aquatic ecosystem.

So it can't be discounted. It is incredibly important to have that template. So you're evaluating the effects of this proposed project on aquatic habitat. That's the first thing, but if this project can be built, 50 years down the road, we also want to know what has this project done to that template or that baseline condition.

So the services and their consultants are obviously very concerned that important habitat types are adequately mapped and characterized and described because of the implications that they have, you know, in the design and analysis you see for numerous studies, like instream flow, for example, and I'm sure Chris will have quite a bit to say about that.

Jeff also has quite a few issues associated with aquatic habitat mapping. I think we talked a little bit about it in Study 9.5 and 9.6, and again, in the past, you know, we've expressed some concerns that there needs to be additional mapping at the mesohabitat level in the sloughs and the beaver complexes, and FERC, essentially agreed with that recommendation and we appreciate AEA's effort to go

out there and do that.

We have not seen the results of 2014 yet. We're looking forward to reviewing that and I'm sure we will have comments on those, but at this point, I want to get on the record, just to say that this mapping effort is, indeed, very important and we will be closely examining what's been done to date.

MR. PADULA: Thank you, George.

MR. GILMOUR: Sure.

MS. MARCZAK: I absolutely agree with you, George, and I think that one of the strengths of this study is the multi -- multi-structured approach to mapping habitat, whether it be line mapping that was completed in 2012 versus [videography based] habitat mapping that [has been] completed and then there's the process of ground-truthing that started in 2013 and was completed in 2014.

MR. GILMOUR: Right.

MS. MARCZAK: So there are multiple -- multiple levels in play there to try to nail down habitat assessments.

MR. GILMOUR: Yeah (affirmative), and I was happy to see that the ground-truthing results were pretty positive. It looks like you guys did a pretty good job of

capturing habitat types.

MS. MARCZAK: It's from 2013. We haven't had a chance to look at the completed set of habitats for 2014, but yes, definitely positively coming out of 2013.

MR. GILMOUR: Okay, thanks, Laurie.

MR. PADULA: Jeff.

MR. DAVIS: Yes, thank you, and as you guys -- we've been talking about habitat classification, of course, for a long time through the TWG meetings. I guess I -- my initial frustration really with this study, more than any of the others, was the multiple different references to outside publications, 2012 publications, appendices to other studies, rather than having all of the information in the ISR itself.

A lot of those studies were completed prior to the FERC determination. So those differences in levels of habitat classification weren't incorporated. So when you look at the relative abundance or relative lengths of different habitats, they mixed different classes, level three and level four classes.

The one thing that I felt like the FERC determination gave the services that I didn't feel like was provided within this ISR was the detailed line maps on aerial photographs of the macrohabitat classes. So the FERC determination said that we

recommend AEA provide detailed descriptions of methods and results of 2012 and 2013 habitat mapping in the initial study report, including a complete set of photographic base maps delineating macrohabitats, level three, and mesohabitats, level four, for all map locations.

Now, again, there was a lot of references. I went through all of those and did not find those maps. I found Appendix A, within the ISR, which -- the line maps of potentially macrohabitats, although the reference was to mesohabitat classifications within the mainstem, and Appendix D, which was ground-truthing of the macrohabitat classification for both the Upper and Middle River.

There was a lot of areas in Appendix A that were totally absent, focus areas that were not totally classified at the macrohabitat level, within Appendix A, provided within this ISR. There was no real descriptions of how those determinations were made, again, and then there was discrepancies between the ground-truthing that developed the Appendix D and the initial classification in Appendix A, and again, it's really important to have a clear template of where these macrohabitats are.

There are already -- fish distribution abundance sites have been selected based

on macrohabitat. The representativeness of focus areas has been discussed relative to macrohabitat distribution, and you know, we have a FERC determination that said to provide this information.

I really think that needs to be presented to everybody in the services as complete detailed maps in here, so that we can evaluate the classification that was done at the macrohabitat level and mesohabitat, where it's been completed. I have some other comments, but really, that's the major one.

MR. GILMOUR: Yeah (affirmative), the -- this is George Gilmour again. The other thing about habitat mapping, the way I picture it, is that it's almost like a GIS layer or exercise. Your first map layer is the habitat data. Your next one is the species distribution, and that could be over certain time periods, you know, what it may, you know, who knows?

You could then, you know, look at other variables on top of that, instream flows at certain times of the year, the effects of ice on off-channel habitats, and you build this picture that then everyone is able to look at and they'll come to an agreement on, this is what we have as a template, and unless we all have that same understanding, we may be thinking about it in different ways.

So you know, this is something we'll probably talk about down the road, but something that I've been pretty adamant about is that I think we need to synthesize this data into a comprehensive conceptual foundation document, for lack of a better word, that everyone can look at, be on the same page, before you dive into the complicated realm of evaluating alternatives.

MS. KEEFE: That's an interesting concept, George. I appreciate it.

MR. GILMOUR: Sure.

MS. KEEFE: Laurie, do you have any...

MS. MARCZAK: You know, I really -- yeah (affirmative), I really couldn't hear. Was that Jeff Davis who was speaking initially?

MS. KEEFE: Yes.

MS. MARCZAK: I missed even the announcement of who that was.

MR. PADULA: Yes.

MS. MARCZAK: And then I really didn't catch much of it. The only thing that I was (indiscernible - interference with speaker-phone) was [the question of whether Focus] Areas were 100% ground mapped, as [MaryLou] said, that the nature of the variance, first variance [was that we had] limitations on access and



[some locations were not fully mapped at the conclusion of the 2013 field season however] all of those were [completed] in 2014.

MS. KEEFE: I think...

MR. DAVIS: Well, no, you didn't actually hear my comment, but I don't really want to go over it all over again.

MS. KEEFE: Well, I do think, that you know, so that we will have more discussion on habitat mapping, because we have a habitat TM that was filed in September, where we were able to go back to those places where we did not have land access permission and we were able to complete the ground mapping exercise in 2014, and that TM has updated that.

In addition, I believe in that TM is a QAQC, which you alluded to in your comments, Jeff, which -- where we made an analysis of the remote mapping call versus the ground-truthing call, and we went through a process of, are those the same? If they're not the same, what are we going to do about it, and so that is all presented, correct me if I'm wrong, Laurie, that's all presented in the TM, and so after you review that, we'll be able to discuss that in January.

MS. MARCZAK: Mary Lou is correct.

MS. WALKER: This is Sue Walker with NMFS. Another point I want to make is just a procedural point. This is very, very difficult with presenters on the phone who cannot hear the questions. It doesn't work. I hope that by January, there's a better system or these people are actually here in person. It's not very productive as it's playing out today.

MR. PADULA: Thanks, Sue. Matt, did you have a...

MR. CUTLIP: I just had -- yeah (affirmative), just a quick -- go ahead.

MR. PADULA: You need a microphone.

MS. MARCZAK: Actually, sorry, could you back up? I couldn't hear anything (indiscernible - speaking simultaneously)...

MS. KEEFE: It's okay. It was a procedural comment.

MR. PADULA: Yeah (affirmative), it's okay. It's a procedural question on the challenges of our technology. That's all. Thanks.

MS. MARCZAK: Okay, (indiscernible - interference with speaker-phone).

MR. CUTLIP: Yeah (affirmative), would you repeat the question?

MS. MACGREGOR: We just repeat the question to the person on the phone and we give them a chance to respond, just provide them one comment and let them

respond (indiscernible - distance from microphone) back and forth.

MS. KEEFE: Sue's comment was that it was, a procedural comment that it was very frustrating to have presenters on the phone when they weren't -- that when the technology was posing these challenges and it wasn't a very productive discussion for today, and she would like that to be corrected for the January meeting.

MS. WALKER: Because you can't hear us.

MS. MARCZAK: I'm not going to disagree with you. I have my ear pressed against the microphone. It's quite (indiscernible - interference with speaker-phone), actually.

MR. DYOK: So maybe a solution, if I could, is every time somebody makes a comment where there's a response that's appropriate, please repeat the question, okay, I'm...

MS. KEEFE: I'm happy to do that.

MR. DYOK: Great, thank you.

MR. CUTLIP: This is Matt Cutlip with FERC. I just have a really simple question. It's kind of regarding Jeff's comment, and that is, because it wasn't part of the [ISR], do the photographic base maps exist, and if they do not, will they exist at

some point in time, because he is correct that it said, you know, one of our recommendations was they be included in the ISR.

MS. KEEFE: Laurie, the question was, do the photographic base maps exist for the study in 2013 for the habitats that were mapped and were they included in the ISR? If not...

MS. MARCZAK: Yes.

MS. KEEFE: Okay, if not, would they be? So if yes, now, go ahead and finish. Maybe you can tell us where in the ISR those maps...

MS. WALKER: Well, could we clarify that these are identifying level three and level four macro -- macro and mesohabitats?

MS. KEEFE: Yeah (affirmative). Can you -- can you clarify us -- for us, Laurie, what these photographic base maps identify, that are presented in the ISR?

MS. MARCZAK: So these show the locations and extents of the ground-truthing surveys in 2013, and they show with the macrohabitat (indiscernible - interference with speaker-phone) for mesohabitats, as well as mesohabitats all identified on the (indiscernible - interference with speaker-phone) were made in the field.

We also included (indiscernible - interference with speaker-phone) of the 2012 remote line mapping, maps showing the same lines (indiscernible - interference with speaker-phone) and the macrohabitats and mesohabitats (indiscernible - interference with speaker-phone) where they were made and...

MS. KEEFE: Could -- excuse me, Laurie, could you tell us...

MS. MARCZAK: The (indiscernible - speaking simultaneously) we didn't add (indiscernible - interference with speaker-phone).

MS. KEEFE: Could you tell us where in the ISR, what appendix those...

MS. MARCZAK: I'm just looking for the (indiscernible - interference with speaker-phone).

MS. KEEFE: We're trying to pull them up.

UNIDENTIFIED SPEAKER: I just don't know where to go yet.

MS. MARCZAK: I believe that they are in Appendix C and Appendix D, contain the Upper River and Middle River ground-truthing 2013 survey.

MR. DAVIS: That's not what I was asking for.

MS. MARCZAK: And Appendix A is the remote line mapping.

MS. WALKER: Clarify what you're asking for.

MS. MARCZAK: Appendix D is the Upper River line mapping technical memo that describes the maps produced earlier, previously.

MS. WALKER: And that's right here.

MR. DAVIS: So my comment, and I don't want it -- it was regarding the remote line mapping for the macrohabitat classification. I think she said Appendix A. So maybe you could open up Appendix A, and we can tell you what we're talking about. You'll need to go to the actual map.

MS. KEEFE: That's Part A, that's not Appendix A. That's Appendix C.

MR. DAVIS: This is labeled Remote Line Mapping 2012.

MS. KEEFE: That's when the remote line mapping was completed.

MR. DAVIS: And this is the ISR that you're presenting that shows the status of this project to date. So let's -- if you wanted to look at a few of these maps, we can look at them and I can explain how I say this is incomplete.

UNIDENTIFIED SPEAKER: Yeah (affirmative).

MR. DAVIS: That's what I'm -- blow that one up. This is Focus Area 104. There's no classification for a large number of macrohabitats shown on this map. The whole lower part of Whiskers Creek isn't classified. The side slough upstream

of Whiskers Creek isn't classified. Side channels aren't classified. Macrohabitats aren't shown, just mesohabitat classifications for the mainstem.

We can go through every slide, if you want, and we can go ahead and do this, but that's the problem that we're having with the complying with this FERC determination.

MS. KEEFE: So the maps are there. The question that you're asking is, you were under -- you are under the impression -- I'm trying to rephrase this so I can understand it, that the mapping within the focus area was going to be 100%, and...

MR. DAVIS: Not...

MS. KEEFE: ...these map don't indicate 100% line mapping. Is that...

MR. DAVIS: You have stated that the remote line mapping for macrohabitats is complete. If so, I would like to see the remote line habitat mapping completed. I don't see a complete -- you can go through each one of these slides, go to the next one, if you want, and we can, again, see macrohabitats that haven't been classified.

Since these data were used to select fish distribution abundance sites, I don't know how you made that determination. This figure in this presentation is from 2012, but it says right in the front of it, this is incomplete and done from 2012, and

I'm wondering why, in 2014, we don't have complete line maps?

MS. KEEFE: I would -- I would have to ask our mapping person why there are -- appear to be segments of line maps that aren't on the map.

MS. MARCZAK: Are we talking about the 2012 line mapping data?

MS. KEEFE: Correct, we are. We're trying to understand why, when we look at a map that's in the ISR, the lines don't cover the full extent of the focus area. So there's a yellow line that ends short of what Jeff thinks might be that habitat unit.

MR. DAVIS: And this is a good example, I'm not -- it's not what I think, it's what is shown on the maps, and it's not just focus areas. The FERC determination was supply complete line maps over aerial photographs.

This is Appendix D, a ground-truthing, and you can see now in this one that macrohabitat below Whiskers Creek is classified, although now, it's classified as a mainstem backwater, which is different from the other classification that was given in the technical working group for the instream flow analysis.

We can also see that what was classified on Appendix A, the green line is a side slough and the top right loop handle was, on the other map, classified as a side channel. So there's discrepancies at the macrohabitat level between your Appendix



D ground-truthing and your Appendix A, and your Appendix A is not a complete line map, and I think this needs to be finished and provided to the services and other stakeholders and provide an ability to comment on it before additional work is done.

MS. KEEFE: Well, I think that's fine. I think that you're right. We need to understand why -- but there are, as I said to you, there are discrepancies and we knew there would be between the remote line mapping and the crews on the ground, and we have a QAQC process that we went through, because what we determined was that the ground crews, really probably have to be the best call, unless there's something like the flow condition is such that it's explainable.

So we did go through a QAQC process and that data is reported in the TM. I don't understand the discrepancy between the maps. I don't know if Joetta, who's on the line, has an answer for us or not, but the apparent discrepancy you're seeing in the remote line mapping from Appendix A, that data layer was -- I don't know why there's those spaces that you're seeing.

MR. DAVIS: Right, so I can just...

MS. KEEFE: But the remote line mapping was completed in 2012. My understanding was, it was 100% complete and it may just -- I don't know what

happened to the layer.

MS. WALKER: Well, this is Sue Walker from NMFS, and this lack of completeness in the line mapping from the 2012 work is very significant. It's not just an isolated incident in the slides. It exists in practically every slide. So we find that the line mapping does not delineate all the macrohabitats and the ground-truthing didn't finish that out either. So this...

MS. KEEFE: The ground-truthing was never intended to go...

MS. WALKER: ...is the population of samples from which we should be subsampling for fish distribution and abundance, and it's incomplete. It's also going to be important for the future, when we're looking at project impacts short-term and long-term. So this is a really important data need for this project.

MS. KEEFE: I -- I hear you. The ground-truthing was never intended to be 100% of the remote line mapping. That was never proposed that way. So the ground-truthing is, you know...

MS. WALKER: Yeah (affirmative), I understand that.

MS. KEEFE: The remote line mapping was intended to be 100%. If the GIS layer is not showing 100%, then that's something we have to clarify.

MS. WALKER: Yeah (affirmative), and it's not just that it's not 100%. It's partial and it contains significant error.

MS. KEEFE: Error, well, do you -- can you...

MS. WALKER: In mischaracterizing some macrohabitats.

MS. KEEFE: No, the remote line mapping was ground-truthed in 2013 and 2014, so we could QAQC the remote calls and make adjustments where there was something that was in the air, not visible 100% accurately. So that's the whole point of the ground-truthing, and that will be -- that is in the TM, as I mentioned.

I can't address this issue, but thanks for bringing it up, Jeff, because we certainly need to know what happened to these line segments that came from that remote layer.

MR. DAVIS: Right, and I'm just commenting that -- this is the point where we comment on this study and the progress on this study and this is one of the study determinations that was supposed to be there to evaluate.

So we recognize, that you know, additional work needs to be done, but I think that this needs to be provided before we can move on.

MS. KEEFE: I think that's great, and this is one of those opportunities where

we've identified something that's missing, and as we mentioned, you know, he wanted to reserve the opportunity to go back and provide more information, because I don't think this is -- I don't think this is a function of the remote line mapping not being completed. I think it's somehow a GIS exercise that...

MR. JAYJACK: So is this something you all could just take a look at in the next month or two and then you can present us with the updated -- correct the data in January and we can move on?

MS. KEEFE: Yes, absolutely, and produce a -- we'll give it to you by November 30th, I think Wayne said, or November 15th.

MR. DYOK: Well, I said November 15th, but...

MS. KEEFE: Okay.

MR. DYOK: But I'm not going -- this particular thing is more than what I was anticipating. So if this is a bigger effort, let me know.

MS. KEEFE: Okay. Yeah (affirmative), we'll have to -- I'll have to talk to our GIS folks and see what -- what is going on with these maps.

MR. JAYJACK: Understand the issue is (indiscernible - speaking simultaneously)...

MS. KEEFE: I don't understand the issue, myself.

MR. DYOK: Right, yeah (affirmative). So once we get this thing, you know, pinned down, on that particular one, give us to November 30, if we needed it. We'll try to get everything to everybody by November 15th, but this wasn't something that I was thinking about when I made my comment this morning.

MR. PADULA: Sounds good.

MR. WOOD: It's Mike Wood, again. I just have a question about what the definition of ground-truthing is.

MR. PADULA: Speak up, please.

MR. WOOD: What's the ground-truthing technique? The reason I ask is my home is right in that picture and I've never had anybody come and ask me anything about it yet. So some of the biologists, I took around -- so I'm just wondering, at some point, what ground-truthing means and I'm always willing to go walk those (indiscernible - distance from microphone).

MS. KEEFE: So ground-truthing for the aquatic habitat survey entailed crews on the ground implementing aquatic habitat mapping protocol, walking the habitat unit and determining length, width, as well as other channel characteristics, substrate

characteristics that are described in the ISR.

MR. WOOD: And has that happened in that area? I think you...

MS. KEEFE: Yes, that's how those lines were drawn. The crews went and they measured. They took measurements and then the measurements that they took, were put into a database that was then converted into a GIS file and that's what you saw, was the line coming from the ground data, the field data.

MR. WOOD: Thank you.

MR. PADULA: Thanks, Mike.

MR. HOLMQUIST JOHNSON: This is Chris with the USGS. I just had a question, and with what Jeff's talking about, with the ground-truthing. A lot of that data was going to be also linked in with habitat suitability criteria and instream flow components and looking at mesohabitats and how that relates to habitat criteria. Is that something that will be discussed Friday or you just said that in the instream flow sections, it relates that data, you know, was being done as part of this study, and I'm just wondering how those are then being, you know, linked together, as far as the overlap of that data. Is that going (indiscernible - microphone distortion) on Friday, I just wanted to make -- while we're on topic.

MR. REISER: You got a microphone?

MR. HOLMQUIST JOHNSON: Sure.

MR. REISER: Yeah (affirmative), we'll touch on that, although, I'm not going to get in a lot of details on that on Friday, but if you recall back on, at least the last proof of concept meeting, we talked about spatial extrapolation, spatial expansion. So this is where the habitat mapping piece would come into play for the instream flow program.

So we'll need it -- we're looking at it from the macrohabitat side of things and that's where we'll be focusing our effort, but this effort here is definitely part of that. So we need that. Yeah (affirmative), good point.

MR. HOLMQUIST JOHNSON: So I think that just ties to -- with that link and how that's being used to extrapolate to a whole river process. I think that just ties into the comment that Jeff's making, as far as needing to make sure that those lines are complete and that they do -- the ground-truthing and the aerial stuff all do match to a point that does ultimately lead to our final analysis of how we extrapolate that to an entire river process and it's just the importance of making sure that's nailed down early on, before those processes begin.

MS. KEEFE: Agreed. Thank you.

MR. PADULA: Thanks, Chris.

MS. KEEFE: Dudley...

MR. PADULA: Again, for folks who are not at the table, even if your microphone is working, we need to also pick you up on these microphones or it's not getting into the transcript. Okay, she's having real difficulty. So that anybody who - out there who has that kind of comment, you're going to have to come forward and, including you, Dudley, (indiscernible - distance from microphone) again.

MR. REISER: Okay.

MR. PADULA: Any other comments on this study?

MS. MARCZAK: I'd actually like -- this is Laurie Marczak and (indiscernible - interference with speaker-phone) and I had [just] two quick comments on what I pulled out of that conversation, that's the ground-truthing is, in fact, intended as [an error] checking process [so] that is the intent of what we're doing with the ground-truthing (indiscernible - interference with speaker-phone) mapping effort (indiscernible - interference with speaker-phone) up there and check the (indiscernible - interference with speaker-phone) line mapping. I guess the



(indiscernible - interference with speaker-phone) that we have, and then the (indiscernible - interference with speaker-phone) is just that as the crews were on the ground surveying (indiscernible - interference with speaker-phone) features that had not been, for whatever reason, mapped on the line mapping, we would do so at the (indiscernible - interference with speaker-phone).

There are a number of new features that [were identified out there] and I agree, we need to write down, there are lines that are obvious on the map (indiscernible - interference with speaker-phone) on there, but we were also picking out features that weren't easily identifiable from the aerial photos when they're on the map.

MR. PADULA: Thanks, Laurie.

MR. GILMOUR: One more quick point, I think -- I think something to note here is that, you know, let's get this thing done. This is kind of a first step. Let's have it complete, checked off the box, and then we can start, you know, building on that information with the instream flow study, geomorphology work, what have -- you know, whatever study you can imagine will come out of it.

To me, it seems like a pretty straightforward exercise to wrap it up, and it

sounds like that's going to happen here in the next month, right?

UNIDENTIFIED SPEAKER: Hopefully.

UNIDENTIFIED SPEAKER: (Indiscernible - distance from microphone).

MS. MARCZAK: Yes.

MR. PADULA: Okay, thank you very much. Thank you, Laurie.

MS. MARCZAK: Thank you for your comments.

**STUDY OF FISH PASSAGE FEASIBILITY AT WATANA DAM (STUDY  
9.11)**

MR. PADULA: Okay, we're going to move onto the Study of Fish Passage Feasibility. Is Dana on the phone?

MR. POSTLEWAIT: I sure am, thanks.

MR. PADULA: That's loud and clear, thank you. MaryLou's going to cue up your presentation.

MR. POSTLEWAIT: Okay, can you hear me okay?

MR. PADULA: Yes, yes, very good.

MS. KEEFE: Do you want to give a brief intro, Dana, on your title slide, please, and then move to variances?

MR. POSTLEWAIT: Actually, I can't hear you, MaryLou.

MS. KEEFE: Would you please give a brief intro on your title slide and then we'll move to your variances.

MR. POSTLEWAIT: Sure, do you want to do the first slide and make it go to the next slide, just for the quick overview? So the big picture of this study and the goal is really looking at feasible fish passage facility options for the dam, and there's three main options, the scenarios. One is the proposed project without any fish passage. One is integrating the upstream and downstream passage facilities into the current design, and then the third one is retrofitting any facilities in the project that's designed without passage, which means, you know, (indiscernible - interference with speaker-phone) design without, something that you could add on later or retrofit (indiscernible - interference with speaker-phone), and then in the retrofit, we talk about defining that.

That's either geographically or temporally, so different places at the dam, somewhere else or at an initial time or other times, would be [identified for] that facility. So really, the big picture is we're trying to come up with a list of alternatives that the whole technical team believes will really work well [to meet

the] objectives.

So as far as variances, we really -- really haven't had many, other than just schedule delays. So the biggest thing was we (indiscernible - interference with speaker-phone) just one or two of the site visits [planned for an] overall flyover was moved in September. So that's, what, about six months, and then the brainstorm meeting was delayed from the original schedule and that we conducted here, this fall in September, and I think as far as modifications, there really -- there are no modifications for the study. It's really has just been schedule related. So the study is still progressing per the original study plan.

MS. KEEFE: And time for discussion.

MR. ZAPEL: I'm Ed Zapel with NHC, and I'll just bring up a few comments on Fish Passage 9.11.

MR. POSTLEWAIT: Yes, this is Dana. I think [I can't hear the Ed]. I'm really having a hard time hearing.

UNIDENTIFIED SPEAKER: You need to be -- he needs to pick you up there.

UNIDENTIFIED SPEAKER: He really needs to speak up, even with the

microphone.

MR. ZAPEL: How about now, Dana, can you hear me?

MR. POSTLEWAIT: Better, but not great.

MR. ZAPEL: Which one's the effective microphone, that one or this one?

UNIDENTIFIED SPEAKER: The little one.

MR. ZAPEL: I'll yell a little bit louder. How's that?

MR. PADULA: There you go.

MR. POSTLEWAIT: That's better, thanks.

MR. ZAPEL: Okay, a couple of comments on the Fish Passage Study 9.11, and I would point out that the services have commented in the past on a few of these items, but in general, no gigantic disparity. We recognize the schedule was delayed for reasons beyond control of the study team, but the goals are still attempting to be met, best possible.

I'll go through my comments one by one. In particular, the biological performance tool that was discussed in the revised study plan was introduced during the fish passage technical working group meetings, but never explored in detail. In other words, the data inputs, in particular, the weighting or scoring procedure, the

mathematical workings of the biological performance tool were surficially discussed, but never in detail, and so that's still somewhat of a mystery. Well, I would say more of a mystery than somewhat, to most of the service consultants and perhaps other members of the study team.

It would be good to get an idea of what that thing does exactly and allow us to excise whatever we think it does from our minds and be clear about exactly what it does. I expect we'll see that in the future.

The other issue about the biological performance tool, it's important, I think, and becoming more important as we see the results of the other studies, is whether or not it fully comprehends and considers the effects of the larger reservoir impacts on the fish populations in the Upper River, both now and in the future, once the reservoir is built, and how that affects our selection of passage techniques or concepts and their effectiveness.

Certainly, you know, a passage facility that might be designed today, given some basic assumptions about fish behavior, physiological response to the reservoir, predation, et cetera, might in the future, if something unexpected arises as a result of the reservoir impact, render that particular passage alternative completely

ineffective, and there are several examples already in the literature that exhibit that disparity. We don't want to make that mistake.

One thing that I think the agencies or the services have commented on before is an expansion or at least a conduct of a literature survey examining different passage types, passage facilities, how they performed in the past and what lessons we can learn about those.

Certainly, we've discussed those in the fish passage technical working group, but it would be nice to have a summary of that literature survey available in the reports to enable us to refer back to that.

Point number four, the fish passage engineering and biological design criteria should not consider limiting physical characteristics of the site or a preference for any particular alternative in advance of feasibility assessment, and by that, I mean we certainly don't want to exclude any particular species, life stage, behavior, et cetera, in the interest of trying to speed things along, and then jump right into an economic analysis before its time is due.

Point number five, as commented before, the feasibility study objectives don't specifically recognize the necessity of passage. However the FERC determination

has already acknowledged that there's a biological need for passage. Hence, one leads the other, I think.

Point number six, only one operation scenario has been considered in the ISR, and that's the full load following OSB1, I think, but the relative differences in reservoir characteristics with various operating scenarios that may or may not be able to be evaluated, and consequently, the effectiveness of any passage facilities that we might examine in detail have very large impacts on how effective those particular alternatives are.

Certainly, we want to consider the full range of project operations and how that affects our selection of a preferred alternative using a biological performance tool fully, before we make that selection.

Point number seven, and this is a commendation, the study methods proposed in the revised study plan for this fish passage feasibility study comport well with standard practice. This is similar to the same process we've all become familiar with on other projects. So that's a commendation.

Again, point number eight, and this goes back to the reservoir effects, reservoir effects on the future fish populations have been commented on throughout



by the services, but it's not really clear how those effects will be recognized and considered fully in the biological performance tool.

Having some familiarity with how I think this biological performance tool is used in the past, it seems pretty easy to blend the details and sometimes forget the bigger picture about the reservoir effects on those fish populations, good and bad, and how they affect our ideas of what will work and what might not work.

Simple point scheduling, we, you know, certainly, we acknowledge that the schedule delays that occurred in 2014 did occur. It happened.

Species consideration, this is the last point. In light of the apparent misidentification issue with juvenile fish, the tag effects that have been brought up and the hydrologic anomalies that were recognized in 2013, we would think at this time, it's even more important not to exclude consideration of any one particular species that exists in the river, Lower, Middle, and Upper, until we have a fuller understanding of the corrected fish populations, abundance, et cetera, in the upper watershed.

I think the technical working group has done a good job throughout the meetings of not excluding any one particular species. So that's commendable. Let's

keep that going in the future.

UNIDENTIFIED SPEAKER: (Indiscernible - distance from microphone).

MR. ZAPEL: Yeah (affirmative), and those operations, we would hope would include a run-of-river, as well as something in between full load-following and the run-of-river, and then as far as study mods are concerned, I don't know if this is really directly related to 9.11 or not, but it's something we've commented on in the past, and that is the temperature effects of the reservoir and the outflows during the wintertime and whether that will change the passage capabilities of adults and juveniles of any species through the Devils Canyon reach and the dam site.

Therefore we think these water quality studies that consider temperature should somehow be extended or extrapolated or the effects considered when we think about fish passage alternatives for adults and juveniles of all species at the dam, and that's all I have to say.

MR. PADULA: Thanks, Ed.

MR. GILMOUR: I have -- I guess I'll build on what Ed had said. He pretty much covered a lot of what I was going to say. So I guess I'm (indiscernible - speaking simultaneously)...

MR. PADULA: That's good, we can keep going and Dana can (indiscernible - distance from microphone).

MR. GILMOUR: Okay. Hi, Dana, how are you?

MR. POSTLEWAIT: Hi, George.

MR. GILMOUR: The point I want to make is that it is, obviously, very important to have an understanding of how the reservoir is going to be operated when you design fish passage facilities, and to date, it sounds to me like AEA and their consultant has come up with a couple of scenarios that represent, what I would consider to be extreme, the extremes.

This room is filled with some very good consultants who have been through this process several times, and I think we all know that somewhere between the extremes is what's going to happen. So I would encourage this group, and in fact, strongly recommend that we start to evaluate, needing an environmental operational regime, something that makes sense for the fish and for the, you know, riparian habitat, start moving in that direction, and that will, not only focus efforts for fish passage, but also result in cost savings, I would think, to the applicant.

You won't need to spend forever on these design drawings of facilities that

may not even have a chance of working. So I think it's, you know, it's something that AEA should strongly consider, and I think the sooner that we define a more realistic operational scenario, I think, the better off we will be, especially within this compressed timeframe in the ILP process.

MR. PADULA: Thanks, George. Dana, anything that you've heard that you would like to respond to today.

MR. POSTLEWAIT: No, I think those are all very good comments and I believe the [study plan is structured to address all of them]. I'm getting feedback here (indiscernible - interference with speaker-phone).

MS. KEEFE: No.

MR. POSTLEWAIT: Yeah (affirmative), anyway, I think that's -- as we progress with the study, I think we'll be hitting all those [points] pretty much head on and addressing that as part as the plan. Ed, your comments on the BPT are well received and it was [understandable]. I could hear you, which was nice, and I think every one of the issues you brought up, we'll be addressing and you guys will all be a part of that with input and review and looking at input parameters and sensitivity analysis of the [BPT model runs].

No, I think they were really great comments and we'll [be able to address them as we continue with the study] and I think we've got [a plan set for] moving forward.

MR. PADULA: Thanks, Dana. Anyone else (indiscernible - distance from microphone) comments? Sue or...

MS. WALKER: Yeah (affirmative), hi, Dana. This is Sue Walker. I just wanted to emphasize a few points that Ed made...

MR. POSTLEWAIT: I'm sorry, I can't hear again, sorry.

MS. WALKER: Sorry, I have to yell at the other speaker. This is confusing.

MR. DYOK: No, you've got to yell in the one -- in that one. You've got the right one for it. You just have to talk really loud.

MS. WALKER: I thought I was talking loud. How's that?

MR. DYOK: No, you weren't. Now you are. That's perfect.

MS. WALKER: Can you hear me, Dana?

MR. POSTLEWAIT: I -- barely, I can.

MS. WALKER: Can you hear me now, Dana?

MR. DYOK: No, it's the top one.

UNIDENTIFIED SPEAKER: That's for the court reporter.

MR. POSTLEWAIT: That's worse.

MS. WALKER: I just (indiscernible - speaking simultaneously), okay.

UNIDENTIFIED SPEAKER: This one is for the court reporter.

MS. WALKER: Let's start this over. I want to emphasize a couple of points.

The first is the literature review is very important. The literature review can save a lot of work, a lot of effort. It's overdue. It doesn't make a lot of financial sense to do work, as new original work, when there is information out there that we could use. So we would ask for that to be a priority.

Another issue is run-of-river. FERC did order that a run-of-river alternative be considered in the range of alternatives. That has yet to be defined. It needs to be defined, and we were told long ago that it would be defined. What we've heard is that this means run-of-river operations during certain periods of the year, and yes, that's true and that's one option.

The other is a project that would actually operate as a run-of-river project, which would probably not, in fact, most certainly would not have the configuration of the current dam, but that does need to be in the mix of alternatives considered.

Then there's the operational model. We have long asked, as George just said,

but that's not new, we've been asking for this for quite some time. We've asked for what we call a modern operational scenario, one that incorporates the features that most dams operating today are using, environmental flows, channel formation flows, you know, flows for fish migration.

It is reasonable to estimate, at least grossly, what those will be. It will be useful for the studies of biological effects. It will also be useful for assessment of the real economic potential of this project and the true generating capacity. So I think that operational scenario is overdue and that would be a priority for this study, and I also want to say that of all the technical work group meetings that we've been involved in, the fish passage technical work group, except for being behind schedule, has functioned very, very well.

We have a great group of people, great minds, and it's been quite a pleasure to be involved with this group. So it always sounds like criticism here, but I want to say that work -- that group is working very, very well.

MS. KEEFE: Sue, I just want to ask a point of clarification. The literature review that you're talking about, you're proposing that as a modification, because in the study -- I think it just died. Because in the study plan, in the FERC approved

study plan, I don't believe we have a literature review component of the existing project. So I'm just looking for clarification that you're asking for a modification?

MS. WALKER: No, there wasn't cursory literature search, literature review done. Dana, maybe you can jog my memory here. Was that something decided upon within the work group as an action item?

MR. POSTLEWAIT: No, I think, you know, I've been sitting here thinking that, too, but my recollection, we -- I don't believe we have. I'm sure we don't have a formal literature review study as part of the study plan or a publication, but what we do have is with all the experts on the team, I think everybody's bringing that to the process and we're compiling some of the studies.

The action item that I recall is we're [compiling some similar conceptual level fish passage] studies [that we will be posting] that would have relevant information and [provide some examples and information]...

MS. WALKER: That's exactly what I'm talking about.

MR. POSTLEWAIT: ...pretty much most of that together and we'll be sending it out in the next round of information in advance of the next meeting.

MS. WALKER: Yeah (affirmative), I think that's a...



MR. POSTLEWAIT: (Indiscernible - interference with speaker-phone) maybe what we need to just clarify is the, you know, the different technical team members' experience that we're all bringing throughout the process, if we need anything formally presented and that's what should be a pretty big effort. The (indiscernible - interference with speaker-phone) done a couple of those [sample studies]. We've done some abbreviated ones for other projects. So I think we might need to understand fairly specifically what you're thinking?

MS. WALKER: Well, this isn't something new, Dana.

MR. POSTLEWAIT: (Indiscernible - speaking simultaneously) have that comment, too, so...

MS. WALKER: Dana, this isn't something new. This is an action item that we developed, I believe it was at the technical work group meeting that we held in Portland, which I think was our first one, and it was an early one, and there has been some small effort expended toward that, but it may be a recommendation for a study modification, because I think it would be extremely useful, and it has already begun. It's just not finished.

MR. POSTLEWAIT: Yeah (affirmative), we can check on that and follow up,

Sue, I think, and see and maybe just continue that discussion and [address it with the next meeting, if] it's something that is helpful to understand, you know, the [review] is definitely we want understanding of experiences with other projects, especially ones related to what we're doing here.

MR. PADULA: Any other comments in the room or on the phone?

MR. DYOK: Well, could I just ask a clarification question of Ed, then?

MR. PADULA: Surely.

MR. DYOK: If you have your list of, what, nine comments articulated, could you go back to number five, and I was trying to listen to all of them and I'm not sure that I got fully everything you said under number five. Would you mind repeating that?

MR. ZAPEL: Sure. Specifically, as we've commented before, the feasibility study objectives don't specifically recognize the necessity of fish passage, but the FERC determination has already acknowledged there is a biological need for fish passage. That's out of the ISR, out of the revised study plans, and it's more a point of clarification than anything else, Wayne.

MR. DYOK: Okay, well, I guess the question would be posed to FERC. Is

that your interpretation?

MR. CUTLIP: This is Matt Cutlip with FERC. I think the way it was worded in the study plan determination was that, that element was largely addressed in the RSP, and I think it kind of got left at that. So that's my understanding. Whether or not there's a biological need, you know, there could be a biological need, but that still wouldn't necessarily mean that there would be a license requirement for fish passage.

So that's part of the whole benefit cost analysis that will happen at NEPA phase of the project. So what we need right now is the information, just to make that determination. The NEPA document would also, of course, address, you know, the biological benefits of fish passage, so...

MR. DYOK: Thank you.

MR. PADULA: All right, thanks, folks.

**STUDY OF FISH BARRIERS IN THE MIDDLE AND UPPER SUSITNA  
RIVER AND SUSITNA RIVER AND SUSITNA TRIBUTARIES (STUDY 9.12)**

MR. PADULA: Next up, Study 9.12, Study of Fish Barriers in the Middle and Upper River, and Kevin Petrone is going to drive himself, I guess, Marylou.

MS. KEEFE: I'll drive.

MR. PADULA: Okay.

MS. KEEFE: So he can stand.

MR. PADULA: He likes to stand.

MS. KEEFE: I know how to do this, right.

MR. PETRONE: I'm going to just stand if everyone can hear me. Can you hear me okay?

MS. KEEFE: No, you need to use the mic.

MR. PETRONE: Do I need to use the mic?

MS. KEEFE: Yeah (affirmative), they can't...

MR. PETRONE: I'll sit here.

MS. KEEFE: Well, then, you're going to have to run your own slides. That's fine.

MR. PETRONE: I can sit. That's great. Hi, I'm Kevin Petrone. I'm based with R2 here in Anchorage.

MR. DYOK: Kevin, you've got to speak up, please.

MR. PETRONE: Yeah (affirmative). I am Kevin Petrone. I'm with R2 here,

based in Anchorage. So that's why I am here today, but we don't have any technical difficulties, hopefully. So I'm doing the study on fish passage.

MS. KEEFE: Excuse me, Kevin.

MR. PETRONE: Yes.

MS. KEEFE: You're not loud enough. You really need to speak loudly, so that they can hear you.

MR. PETRONE: Okay, there we go.

MS. KEEFE: Just eat the microphone.

MR. PETRONE: Okay, so this study addresses fish passage barriers on the Susitna River and the basic objectives are to locate and characterize the existing barriers for fish passage, whether they're vertical barriers, depth barriers, velocity barriers, and characterize those barriers across the river, and then we -- the next phase of the project will be integrating the knowledge of current barriers with potential changes in barriers with other modeling studies. So we are examining both the creation of -- potential creation of barriers and the removal of barriers by project operations.

So this study involves -- has a few components...

UNIDENTIFIED SPEAKER: (indiscernible - distance from microphone).

MR. PETRONE: Yes.

MS. KEEFE: And we also want to just skip to the variances and modifications.

MR. PETRONE: Sure.

MS. KEEFE: So you just have to skip through these slides, sorry.

MR. PETRONE: Yeah (affirmative), it works.

MS. KEEFE: I was going to do that, if I drove.

MR. PETRONE: That's all right. So then another component -- a number of components to the study. I'll jump right to the variances. So we, as many other studies showed, we have a delay in the field surveys of some of our sites. We have since addressed all of the sites that were on CIRWG lands or Alaska Railroad lands in 2014, and I guess the major variance to report is that we had a change from field-based measurements of dam, beaver dams to model-based evaluations, and that also includes some field-based measurements from other studies.

So they used information from the aquatic fur bearers study and surveys that were also done through the geomorphology modeling study to evaluate beaver dam

attributes.

I won't address all these slides. I think we're not getting into that level of detail. Just to say that we have looked at many vertical barriers throughout the Upper River and also looking at trib mouths in the Middle River. Some of this work was done in 2013 and some in 2014, and the characterization of existing barriers is ongoing.

I guess this study is really a quilted study. We're an end user of many other modeling studies and we're integrating with many studies, including the geomorphology study, the ice processes, the flow routing study, instream flow study, and obviously, fish distribution and abundance, to understand the distribution of fish and how the movement might change.

Now, we've had some consultation and we've developed a fish, target fish species list with input from licensing participants, and so some of the results from that meeting and analysis is ongoing. We have no modifications to the study plan, and we have a decision point that we're addressing in the study plan that's being evaluated currently, based on a technical memo from the FGM study, and this will inform a decision point for extending this study into the Lower River.

So this is just the ongoing -- the current state of our work, so barriers from aerial and ground surveys. We're developing an approach to integrate the passage criteria into the modeling framework and we've completed an analysis of barrier conditions and with field surveys in 2013.

So I won't go over all the details here, but we're finalizing passage criteria and we've completed our remaining barrier surveys and we are developing an analysis to evaluate depth barriers in focus areas with integration with modeling studies.

Basically, all the field analysis work has been done in -- essentially, the studies started in 2012. So between 2012 and 2014, all the field work has been done and mainly, that's just a desktop analysis to evaluate current and future barriers of fish movement. So with that, I'll take any questions.

MS. MCCRACKEN: Hi, Kevin. This is Betsy with (indiscernible - microphone distortion) Fish and Wildlife Service, and I'm just wondering if your study looked at the head of the reservoir and the potential for that to be a barrier or to create a barrier due to sedimentation?

MR. PETRONE: Yes, that is a component...

MS. MCCRACKEN: It is?



MR. PETRONE: ...of the study. The main -- the bulk of that work sits in the geomorphology study.

MS. MCCRACKEN: Okay.

MR. PETRONE: Bill Fullerton is here. He could comment on that further, but they are looking at potential delta formation at the mouths of tributaries related to inundation.

MS. MCCRACKEN: I guess I'm just starting to get a picture of realizing more, the importance of sampling above the head of reservoir or (indiscernible - microphone distortion) habitats and the tributaries, as well, the juvenile salmon and it seems like we want to look, the more fish we're finding and how the relative numbers above and below, you know, what the real picture is and how we need to consider those.

MR. PETRONE: Sure. I suppose we, you know, above -- I can talk about many --are you asking me about above the dam site, fish movement above the dam site?

MS. MCCRACKEN: Yeah (affirmative).

MR. PETRONE: Right, so above the dam site, we have certain barriers that

are -- that will be inundated by the reservoir and we've evaluated what existing barriers will be inundated, relative to the low pool and high pool elevations for the reservoir. So that's one part of the study.

I think there are -- the exact number is around -- I can't tell you the exact number, but there are a few -- I think there are two or three different -- I believe I can show you, actually. So there are three tributaries with barriers that would be inundated by the reservoir, so Deadman and then tributary 197.7 and then tributary 203.4, okay.

So we've mapped these vertical barriers. We know their elevations and we know their elevations relative to the reservoir pool elevations.

MS. MCCRACKEN: Does your study look at the reservoir, itself, as a potential barrier for juvenile movement?

MR. PETRONE: How do you mean, specifically?

MS. MCCRACKEN: Just (indiscernible - voice lowered) like behaviorally, will they go -- I mean, will they even go there? Are they going to be stacking up or are they going to go somewhere else and...

MR. PETRONE: Well, that's something we've discussed. We had -- we've

had discussions with Dana, and the fish passage feasibility study, and as I mentioned, we're also evaluating formation of deltas, modeling delta formation of tributaries that drain into the reservoir.

So I think in terms of the formation of physical barriers, that's the main concern. I'm -- this study doesn't -- this doesn't address fish behavior insofar as comparing reservoirs versus moving water, per se. We're addressing the delta formation at tributary mouths, and that's a function of the sediment load from the tributaries downstream and how that sediment may accumulate at tributary mouths. So that's the main focus of the formation of barriers of the -- in the Upper River.

MS. MCCRACKEN: Yeah (affirmative), thank you. I was just thinking about it because, as we realize now, that we probably do have some [migration] above the head of the reservoir and that's something we might want to think about.

MS. KEEFE: Thanks, Betsy.

MR. RUGGERONE: Hello, my name is Greg Ruggerone with NRC. I'm working with the services. I reviewed this ISR and as Kevin pointed out, it's ultimately a study that's in progress, and at this point, I think largely incomplete, especially with regard to the last two objectives, which are truly the key objectives,

because that's where you get into potential project impacts on passage into and out of tributaries, and the first two objectives were partially addressed, I think, in the study report, which was fairly brief.

One key issue is that the ISR implied that the species list had been finalized and fish passage criteria had been finalized for each of the species, at least the salmon were -- there is some information, but in discussion with the services, they indicate that they haven't been fully consulted with the study team on these issues and they haven't given their approval on the fish passage criteria and species list.

The study correctly indicates there are a lot of species where there are no criteria for evaluating fish passage, and that's an important issue, but the study report did not provide any plan for moving ahead on how to address that issue. That's something that probably could be addressed in a working group, but it was something I was looking for in this, is some ideas on how to address those other species.

MR. PETRONE: Sure, I appreciate your comment. So we had a meeting in March with -- a technical team meeting, where I proposed passage criteria, because when I'm talking about passage criteria, it's mainly swimming speeds that sustained

and burst speed, for instance, so we're evaluating different types of swimming and how -- the abilities of the fish, and so we proposed a set of passage criteria for the fish species that are on our initial list.

Since then, we've added two species to that list [Arctic Lamprey and Humpback Whitefish] and we seek to -- at that time, we asked for feedback on the species and criteria that we proposed. So we took on that feedback. We haven't -- you're right, we haven't yet published the updated criteria for the remaining fish species and we can talk to AEA about an avenue to communicate -- to communicate this, the full list of species and the proposed criteria, this year, perhaps, and see if we can establish a final list of species and criteria.

MS. WALKER: Yes, this is Sue Walker, excuse me. I'd like to clarify that the consultation, that consisted of discussion at a technical work group meeting. I believe that was March 19th, and NMFS did notify AEA that we had another hydropower project meeting. We were unable to attend this technical work group meeting.

So from our perspective, presenting information at a technical work group meeting, especially one that we let the applicant know in advance we were unable to

attend, doesn't constitute consultation. So we believe that -- we do believe that the species list and life stage list is a good start, and you know, it's coming along.

We don't concur that consultation has actually happened, and this is repeated in another -- a number of other studies. So maybe it would be useful for us to actually define what consultation means and therefore, we would know when we have accomplished that. From our perspective, this was not sufficient.

MR. RUGGERONE: Could I help continue? Regarding the fish passage criteria, I think one of the plans indicated that there was going to be a synthesis of information pulled together describing fish passage criteria in the literature, but I never saw any of that information and the report seems to indicate fish passage is sort of a mechanistic engineering type process, just vertical height and how high can fish leap and so forth, but there's a lot of fish behavior involved with whether or not they can negotiate a velocity barrier or even a vertical barrier, turbulent -- they react to turbulence, standing wave, and they have different times when they want to move, depending on changes in flow and so forth, that could facilitate, you know, the discussion about fish passage criteria that would be used in that.

Just moving onto a few other points, as you know, the study report was quite

brief and I think it would be very beneficial if the study was a standalone document.

This study depends on a lot of other studies, the instream flow study, and the geomorphology study, and how changes in the tributary mouths will change with sedimentation and flows and so forth, but there is no description of how you would be using information from those other studies in evaluating fish passage.

I think, as you move forward, that will be good to provide some detail on what needs to be known from those other studies to help characterize fish passage into the tributaries that you're looking at.

Another issue is in the Middle River, only seven tributaries were examined for characteristics of the tributary mouths, and every one of those was different, suggesting that you can't really easily characterize those tributary mouths and how fish might respond to changes in those areas.

So I would suggest that you need to look at additional tributary mouths and characterize the habitat and fish passage abilities over each one of those.

MR. PETRONE: I can give you an update on tributary mouths throughout the entire Middle River. We've evaluated all tributary mouths, either from surveys that were done last year, surveys that were done this year, that I just completed a couple

of weeks ago, also surveys that were completed by the -- within the geomorphology study.

So we have a complete list of tributaries, and I think that table is in the ISR, which would show you a complete list. So although only, you know, a handful were surveyed in 2013, they're all being addressed in one way or another by this study or related studies.

MR. RUGGERONE: Okay. Earlier today on the escapement study, we heard how a lot of the salmon species are utilizing the tributaries, but that's information that seemed to be quite useful to your study, as well, but yet, there was little mention of that work in your current observations. That would be something to try to incorporate, because as we heard, there are, apparently, relating through the aerial surveying of the tagged fish, their relation of the fish to some of the barriers.

MR. PETRONE: Of course, and in the end, we intend to incorporate all the available data on fish distribution in this setting. So yeah (affirmative), point taken.

MS. KEEFE: This is Marylou, sorry about that. This is Marylou and I just want to comment that, in fact, this Study 9.12 is a physical study. It, you know, if we go back to the study objectives it is -- just so you're aware, I mean, it is a



physical study of the physical habitat that is there now, so that we can understand how that may change with changing flows in the river, in the future. We can't possibly predict fish behavior in the future. So we're really focusing on a physical study of habitat.

MR. RUGGERONE: But at some point, you need to evaluate, well, how do fish respond to that change in habitat? Where does that happen?

MS. KEEFE: Well, I guess if that were -- if that were something that were important to evaluate after the -- after the project was built and operations were shown to effect flows, then that's when you can look at that.

MR. DAVIS: I just would like to -- this is Jeff Davis from ARRI, to comment on, you know, the FERC determination did say that you would look at behavioral barriers.

MS. KEEFE: It would be great if you could maybe point that out to where it is.

MR. RUGGERONE: And just one last comment is, there's very little information, as with the adults, but also juveniles, juvenile salmon and the criteria to be used to evaluate juvenile passage and also passage during the wintertime, each

season, and life stage of the fish, including the wintertime period.

MR. PETRONE: I think in the presentation that's available, the...

UNIDENTIFIED SPEAKER: Repeat the question.

MR. PETRONE: I think the comment was that the -- I'm addressing just the ISR, what was in the ISR, we did not include information on criteria, fish criteria at different life stages and different seasons comparing, particularly winter -- winter periods.

I guess that -- but I moved to this slide because it shows the link to the presentation that we gave -- that I gave during that March 19th meeting. So there are criteria that we proposed for adult and juvenile life stages at that time.

I think we did note the seasonal, the periodicity of fish movement at that time for another slide. I can't recall if it specifically addressed the winter period, but that's something I (indiscernible - voice lowered) and we will -- we'll consider. I've certainly been out there in the winter. So I understand [conditions] in the winter period.

MR. RUGGERONE: When do you anticipate having the next report, because I didn't see one coming up in this new round of reports, and...

MR. PETRONE: We don't, you know, in our scope for work, they do not have, you know, a published report plan for this year. We can discuss it with AEA how to best address, best communicate the [passage criteria] results.

MR. RUGGERONE: In your report, I think you mentioned that some of the studies, the geomorphology study, they would be coming out with some results this quarter. So that's why I was wondering how you were going to incorporate and when.

MR. PETRONE: Yeah (affirmative), that's true. I guess the model integration is ongoing and we have been discussing with the modelers and Study 6.6 what approach we'll take, and I guess, the first step is to, in a similar way that they have with the concept meeting in April, we'll have a proof of concept meeting, you know, after these results from -- starting with 128, with hopefully, 128. We'll use the model output from the [proof of concept] at 128 and can evaluate, you know, at least determine what approach we'll take in focus areas to (indiscernible - voice lowered) depth barriers. So from those 2D model rounds, we'll have a mesh grid, two meter, a two-meter resolution with depth and velocity, and we can evaluate how fish [passage] changes over different flow levels. I think the first approach we

talked about and discussed was doing a [proof of concept].

MS. KEEFE: So just to clarify, there is no report scheduled for this study until the USR.

MR. RUGGERONE: Until the what?

MS. KEEFE: The updated study report.

UNIDENTIFIED SPEAKER: Updated study report.

MR. RUGGERONE: (Indiscernible - voice lowered). Thanks.

MR. PADULA: Matt, and then I'll get to you, Betsy, again, or Becky.

UNIDENTIFIED SPEAKER: I see some of the Becky's.

MR. CUTLIP: Matt Cutlip, with FERC, pardon my ignorance, but is the -- is there a document where you have set forth the draft criteria in target species. Is that (indiscernible - speaking simultaneously) plan?

MR. PETRONE: Well, the -- the target species are included in the ISR. The criteria are included as a table in the presentation that we gave in the March 19 meeting. So you can find that on the Susitna website.

MR. CUTLIP: Okay, so it's out?

MR. PETRONE: Yeah (affirmative), it's this link right here, yeah

(affirmative).

MR. CUTLIP: Okay.

MR. PETRONE: Or that's -- that's the, I think the outcome from the meeting and that's in the [meeting notes] and the presentation is also [available online].

MR. JAYJACK: So is that something you all can work out in the next couple of months, prior to the director's determination, kind of get agreement on the study criteria and the species list and then it just seems like something small that I, you know, that I would not -- I'm thinking selfishly here, but it's -- it's kind of something I would rather us not have to deal with in a director's determination letter. I don't know. I'd just like to hear what you all think.

MS. MACGREGOR: We can do that.

MR. PADULA: Becky.

MS. LONG: Okay, this is Becky Long. I just would like to understand a little bit better, you mentioned there's a decision point whether you might extend the studies for Lower River. Could you explain how the decision will be made and when?

MR. PETRONE: Sure. The decision is mainly based on model results that

are outlined in the technical memo that was delivered late last month. I guess it's tied to a decision point that the Study 6.6 is addressing, as well. Although, their decision is about studying beyond river mile 29, but we're relying mainly on the results from the [Middle River] modeling, which is evaluating how hydrologic and sediment conditions change under the project [flow] conditions.

So I guess the -- they -- in that technical memo, Study 6.6 proposed that to not extend the study beyond river mile 29, because there's -- because there are subtle changes in flow and sediment (indiscernible - voice lowered) under project operations, based on model results.

So that result is mostly -- is mainly what's informing our decision point to move into the Lower River. We expect that the -- well, first of all, the character of tributaries in the Lower River is much different than we find in the Middle River. We look at the river mouths of the Lower River tributaries, there hasn't appeared to be current barriers to fish movement into those tributaries, and model results suggest that the system will still be an aggrading system and it will still operate similarly to what it is now, and I think that's mainly due to attenuation of project effects below, you know, below the Tri-Rivers confluence, so -- and anyone can correct me if I'm

wrong, but I think that's our summary of those results, those model results that are tied to our decision.

We expect to make that decision -- I guess we can make it at any point, now that that TM is available. It was just made available in the last -- in the last two weeks.

MR. DAVIS: Yeah (affirmative), I just have a couple -- this is Jeff Davis, again. I just have a couple of things to add. It sounds like the issue of criteria is going to be addressed. You said the presentation in March presented it. You put out an ISR in June. That's May, June, three months later. I didn't see any passage criteria within the ISR, and so it's hard to evaluate those criteria and determine if the methods to evaluate those criteria are adequate, if we don't know what those criteria are.

For example, the statement has been made that passage has been finished in Upper River tributaries or completed and it's really a desktop job at this point. I'm not sure how you're going to model the loss of these that may create migration barriers to dolly varden, say, into tributaries post-project without more detailed data than currently has been provided in the form of leap heights and classified areas as

cascades.

Similarly, if a migration -- if a passage criteria for a juvenile coho, say, is a velocity of .3 or three feet per second for a bursting speed, and I don't know what equation you've used or what actually those criteria might be, it's questionable whether the data that's currently being provided at tributary mouths is going to be able to provide the information to evaluate whether those velocities are exceeded.

In that current point measures, in the fall (indiscernible - voice lowered) throughout the mouth of the tributaries at approximately five to 10-meter intervals have often had velocities over three feet per second, but we don't know what the velocities are lateral to those points. Those are a couple of comments.

You talked about the Lower River. Certainly beaver ponds, getting access into beaver habitats is a potential barrier and it's certainly something that should be looked at within the Lower River, if in fact, project effects are going to be extended downstream. As beaver -- access into beaver ponds, either upstream over the dam or through breached berm, will require -- will be affected by changes in water surface elevations.

The FERC determination, I believe did talk about the implementation plan



and developing methods for evaluating migration barriers during winter. The current approach is to use the 2D hydraulic models during winter to evaluate passage criteria. However, the winter ice study models have an assumed ice thickness depth of one meter. Therefore, all the hydraulic parameters underneath the ice are not accurate, essentially, because there is not a consistent one meter ice thickness across the river throughout the winter. There's border ice. There's different thicknesses in different off-channel habitats. So I still haven't seen -- well, once the criteria had been developed, how you will evaluate passage criteria in off-channel habitats during winter.

MR. PADULA: Thanks, Jeff. So we have a request to try and wrap this up as soon as we can and we appreciate the input that's going to give us the substance so that we can -- AEA can consider in terms of (indiscernible - distance from microphone) can get back and try to (indiscernible - voice lowered). Any other comments on this study? Sue.

MS. WALKER: Just one more point, a question, really, when can we expect to receive those fish passage criteria, by species, life stage?

MS. KEEFE: Well, you can review the PowerPoint. It was on the

PowerPoint from the March 19th meeting.

MS. MACGREGOR: Yeah (affirmative), the criteria are on the PowerPoint on the website from March 19th.

MS. KEEFE: That would be a start.

MS. WALKER: Well, that's available, but as we just discussed, we need more detail. We need to know where these...

MS. KEEFE: Right, I just said it's a start.

MS. WALKER: Where it's developed, the -- it's not enough.

UNIDENTIFIED SPEAKER: What species?

MS. WALKER: Yeah (affirmative), we're...

MS. MACGREGOR: We'll get an answer after the break as to when we will provide the information.

MS. WALKER: Yeah (affirmative), we need for all species -- all species, all life stages. So can you give us an idea when to expect that? Will this be there by the November 15th date?

UNIDENTIFIED SPEAKER: (Indiscernible - speaking simultaneously).

MS. MACGREGOR: After the break, we'll give you an idea of when we can

pull that information together for you.

MS. WALKER: Thank you.

MR. PADULA: And it's a perfect time for a break. It's 3:10. Let's go for 15 minutes, 3:25, get some fresh air in the room. We have three more studies to do after the break.

3:10:51

(Off record)

(On record)

3:32:21

MR. PADULA: All right, thank you. We have a few studies left to do, but before we do that, a couple of folks were having technical difficulties and other challenges today (indiscernible - distance from microphone) very brief comments who want to get on the record. Whitney's going to give a written statement or statements to the court reporter and Dara Glass would like to make a very brief comment. Is it on?

MR. DYOK: Yeah (affirmative), make sure the green light is on.

MS. DARA GLASS: Hi, I am Dara Glass. It's D, as in David, a-r-a. It

sounds like Sara, and I am Land Manager for Cook Inlet Region Incorporation, which is one of the members of the group that you all know as CIRWG.

Originally, up until a couple of years ago, CIRI was the surface and subsurface owner of lots of land up in this area and in March 2012, we conveyed the surface estate to our village, six of our village corporations. Prior to that conveyance, CIRI was adamant about including the two additional access corridors to the dam site, north of the river and south of the river. They are now known as the Chulitna and the Gold Creek access routes.

Recently, AEA sent to us letters stating that they were going to request that the Chulitna corridor be dropped due to fish habitat issues and several of the tributaries, specifically Indian and Portage. As a land owner, as a person who is quite knowledgeable about the NEPA process, I highly encourage FERC not to make this decision until after all of the studies are completed, so that we can make an educated decision about all of the access routes at the same time.

We would like to see all of the studies continue in the Chulitna corridor so that we can do educated comparisons against all of the other -- of all of the other access routes.

Eliminating one at this time is not fair and it tilts things in one certain or in three certain directions and -- and that is not what the EIS is all about. Thank you.

MR. PADULA: Thank you, Dara, and that's relative to Study 9.13.

MS. DARA GLASS: Nine-thirteen.

MR. PADULA: So moving on with our agenda, 3:30 item, Genetic Baseline Study.

UNIDENTIFIED SPEAKER: Steve.

MS. MACGREGOR: Steve, doesn't Whitney want to say something?

MR. PADULA: No, Whitney's just going to hand a sentence over to the court reporter, that's all.

MS. MACGREGOR: Okay.

MR. PADULA: Did you have some other remarks before (indiscernible - speaking simultaneously)...

UNIDENTIFIED SPEAKER: Yes, yes.

MS. MACGREGOR: Yeah (affirmative), to follow up on this last study we just talked about, the barrier study, so we'll -- we will provide -- is this on?

UNIDENTIFIED SPEAKER: Yes.

UNIDENTIFIED SPEAKER: No, I turned it off.

MS. MACGREGOR: We will be able to provide a complete list of the target species and the criteria by November 15th.

MR. PADULA: Thanks, Betsy.

**GENETIC BASELINE STUDY FOR SELECTED FISH SPECIES (STUDY 9.14)**

MR. PADULA: Chris, it's all yours.

MR. HABICHT: Great, thank you. I'm Chris Habicht. I work for Alaska Department of Fish and Game, Gene Conservation Lab, and I'll be presenting the Genetic Baseline Study for Selected Fish Species. So this is being remotely controlled over there, so I'll figure out which slide I'm on.

So we skipped a bunch of slides that kind of introduced the project, but I'm going to go directly to the variance slide. We have no variances in this -- for this study. However, we did have issues with land access in the Cook Inlet Region Working Group lands above Devils Canyon in 2013, and that land access -- those land access issues affected both the Chinook sample collections and Coho and sockeye salmon collections.

MS. KEEFE: Wait a minute, you wanted to talk about something here. Sorry, I'll just...

UNIDENTIFIED SPEAKER: This is great.

MS. KEEFE: Is this it?

MR. HABICHT: Did you -- did we want to talk about Fish and Wildlife Service and National Fisheries Service consultation?

MS. KEEFE: You -- what's -- or is that -- is this? No. I can't -- I can hardly see. I should not be driving.

MR. HABICHT: We just wanted to point out that we had some consultation with Fish and Wildlife Service and National Marine Fisheries Service. Back in March, we had a meeting where we met with both agencies. These were really productive meetings that added a lot to the project.

They helped us refine statistical analyses and we're going to continue to refine those statistical analyses as we gain distribution of size -- distribution and size of the samples. Through these interactions, we also decided to increase the number of SNPs or genetic markers from 96 to 190 for collections in the Middle and Upper Susitna River. This is for Chinook salmon, and we decided to -- they recommended

that we exclude related juvenile from statistical analysis, which was originally proposed.

We also have, in the revised draft final 2014 implementation plan, comments from both Fish and Wildlife Service and National Marine Fisheries Service that are - - that we've addressed point-by-point, and again, most of these comments and suggestions, we agree with, and we're trying to implement. I just wanted to say that it's been really helpful to have these in making this project stronger.

MS. KEEFE: Sorry, here it is.

MR. HABICHT: Okay, we're not planning any modifications to this study. We have, as I said earlier, have been working with Fish and Wildlife Service and the National Marine Fisheries Service, and they provided all of these comments and suggestions, and so as those come through, the study will change. These are generally smaller details, but they've made this -- again, made the project a lot stronger.

MS. KEEFE: So now you're ready for questions.

MR. PADULA: Wow, that was a fast one.

MS. KEEFE: That's how we like them.



MR. PADULA: Does anyone have any questions for Chris? Sue's getting ready.

MS. WALKER: Hi, this is Sue Walker with NMFS.

MS. MCFEE: Yes, this is Megan McFee. I'm subcontracting with (indiscernible - interference with speaker-phone) to do a review of this and I had a point of clarification about the [exclusion of] related juveniles.

It was my understanding that NOAA or NMFS had recommended strongly against excluding the juveniles and that the response to that was in agreement and so juveniles would be included. So can you clarify that?

MR. HABICHT: Yes, thanks for the comment. So we -- the National Marine Fisheries Services recommended that we not exclude juveniles based on relatedness and so because they -- their rationale behind that was that those juveniles represent the best available information about allele frequencies for populations upstream of Devils Canyon.

We planned to look at relatedness amongst individuals and those are some of the analysis that are in the ISR. We are simply, at this point, not going to just eliminate those individuals that appear to be related. So we'll -- we will be working

again with Fish and Wildlife Services and National Marine Fisheries Services to clarify exactly how that analysis is going to go.

My understanding is it will be somewhere in between excluding and including. So there will be some of it will be -- more individuals will be maintained than those that are identified as related. Does that help?

MS. MCFEE: Yeah (affirmative), I think it -- yeah (affirmative), I think it will be worth revisiting that with NMFS, in terms of getting more information about why it was (indiscernible - interference with speaker-phone) recommended not to exclude them.

MS. WALKER: Yeah (affirmative), this is Sue Walker with NMFS. I have one comment. First, I'd like to thank Fish and Game, and Fish and Wildlife Service for the cooperative nature of the study. It's working -- it's working quite well.

I have a question, though. There was a preliminary analysis report produced this spring, which we did review, and is that report included in the ISR?

MR. HABICHT: Yes.

MS. WALKER: I'm not clear on that. It's -- that's a fuzzy area.

MR. HABICHT: Okay, so yes, there was a preliminary analysis done and

that's what was used in -- to start the consultation in March, and the analysis for that is included in Part B, Attachment One, of the Initial Study Report, which is the implementation plan for 2014.

MS. WALKER: Okay, and great, thanks for clarifying that, and then, when can we expect this new consultation on inclusion of siblings or additional consultation, basically, what's next?

MR. HABICHT: Yeah (affirmative), so in the implementation plan is also a timeline and I believe the next consultation is scheduled for this winter, because I -- let me just take a look here. It's scheduled for February or March 2015.

MS. WALKER: And then, Megan, I know you had a couple of other comments on definitions of self-sustaining and genetically isolated, and a couple of other points. Do you want to make those?

MS. MCFEE: Yeah (affirmative), I do, and so far, the preliminary analyses haven't been interpreted too extensively, which is probably a smart thing, they [have] limited samples and so I think that's a good [start], but I did have some questions about the hypothesis of the population structure of [above Devils Canyon] salmon and so a lot of this comes from that little chart Figure 2.1 and I think the

draft Initial Study Report.

So the flow chart makes sense to me from the concept of trying to figure out whether or not [the genetic differentiation among populations is] going to be [adequate] to perform the mixed-stock analysis on the juveniles, but I do have some questions about how much this population structure is going to be used to infer demographic processes going on in the drainage, because there are some aspects of the hypothesis that seem problematic to me in terms of interpreting [demographic processes].

So for example, the flow chart, the first step is whether allele frequencies [Chinook salmon] from collections above Devils Canyon are different from those below the canyon and one direction is, no, they are not different, and the interpretation is that they are [similar to collections] from below Devils Canyon and then there's no reproduction above the canyon, but of course, you can have a population that is reproducing and basically has no difference in allele frequencies from the population below, simply because there hasn't been enough time to diverge or the [population size] has been [relatively] large.

So I guess my question is, how much of the population genetic results are

going to be used to make inferences about what's going on demographically (indiscernible - interference with speaker-phone)?

MR. HABICHT: Great questions. We will be using that information to try to get an understanding or an estimate of the number of generations of separation, using information from other studies, including numbers of fish that ascend.

So if we understand or have some idea of what effective population sizes are, and we have some understanding of what the  $F_{ST}$  is, or that's the amount of genetic variation among populations relative to the overall amount of genetic variation, if we have an understanding of those components, we can estimate, then, the number of generations of separation.

That kind of information -- that's the kind of information that will give us some insights into how genetically divergent or potentially differentiated these upstream collections are from the populations just below the falls.

MS. MCFEE: And do you think three to four years of collections is sufficient to do that?

MR. HABICHT: Another great question, and we don't know until we look at the data. So what we do know, is that we're getting a lot of samples from above the

falls, and we know we have a lot of samples from collections below the falls. So we're getting really good frequency estimates.

What we don't know is, as you mentioned earlier, the relatedness of the individuals above the falls. We don't know, with this preliminary analysis, we don't know what the variation is among years, and that would be critical, obviously. So I don't know if I can tell you, with the preliminary analysis that we have at this point.

MS. MCFEE: Great.

MS. WALKER: Chris, you're referring to falls. Do you mean Devils Canyon?

MR. HABICHT: I'm sorry, Devils Canyon, yes.

MS. MCFEE: Okay, and my third question was, when you were trying to -- so assuming that you do find difference in allele frequencies, your next step is to determine if Devils Canyon allele frequencies are temporally stable, and in order to do that, you needed to understand the effect of effective population size on that, and what is the method you're going to use to estimate effective size?

MR. HABICHT: Well, we were going to use information from other studies that estimate the number of salmon that migrate up as a census size, which would be

the upper level at effective population size, and we would -- if we used that information, then we...

MS. MCFEE: Did you hear my question?

MR. HABICHT: I'm sorry. Could you please repeat it? Can -- can -- Megan, can you hear me?

UNIDENTIFIED SPEAKER: We lost her.

MS. WALKER: Megan, can hear Chris?

MR. PADULA: Megan, you're not hearing Chris, right?

MS. WALKER: Megan, can you hear anything?

UNIDENTIFIED SPEAKER: We lost her.

MR. PADULA: Megan, are you there?

MS. MCFEE: Okay, did you hear my question about estimating any?

MR. HABICHT: I did. Thanks, Megan, now can you hear me now?

MS. MCFEE: Yes, I can, thanks.

MR. HABICHT: Okay, so we were going to use information from other studies that estimate total population size, so census population size, and use that as the upper end of the effective population size, and then, using that information and

the  $F_{ST}$ , that's how we would calculate generations of separation.

MS. MCFEE: I think you cut out again.

MR. HABICHT: Sorry. Which part did you not hear?

UNIDENTIFIED SPEAKER: Great question. How about which part did she hear?

MR. HABICHT: Megan, can you hear me now?

MR. MCFEE: Yes, yeah (affirmative), estimating upper bounds using census information and then using  $F_{ST}$  to estimate the times since divergence?

MR. HABICHT: Yeah (affirmative), generations since divergence, yeah (affirmative).

MS. MCFEE: So -- so you're not using temporal variations in allele frequencies, that technique?

MR. HABICHT: Well, that -- there are lots of different ways we could do it, and that's why we're using this consultation with you guys and with Fish and Wildlife Service, and National Marine Fisheries Services, but this is one of the -- one of the ways it could be done. There are lots of different ways you could do it, depending on how much data you have, but if you have adequate allele frequency



estimates across time, you could look at allele frequency changes through time, as well.

MS. MCFEE: Yeah (affirmative), okay, so this is kind of your emerging, more [consultations with Agencies to determine] details following, knowing what kind of data you have and consulting with Fish and Wildlife Service and NMFS.

MR. HABICHT: Exactly.

MS. MCFEE: Okay. All right, I think that's all -- well, I guess -- yeah (affirmative), I think that's all the questions I had. Yes, that's it.

MR. PADULA: Thank you. Anyone else in the room? Sue.

MS. WALKER: Yeah (affirmative), this is Sue Walker with NMFS. I have one more question, and I don't know if you'll be able to answer it or not, but I'm wondering how the collection of samples of juvenile Chinook is being coordinated amongst the different studies.

It's confusing when I read genetic study and there's roughly 200 juveniles from Black River and I get different numbers from different studies. So how are all of these collections of juvenile Chinook salmon from above the dam being coordinated amongst the different sample -- the different studies, like fish

distribution and abundance 9.5, with genetics? Could you explain that?

MS. KEEFE: All genetic samples collected from...

MR. PADULA: You need...

MS. KEEFE: Sorry.

MR. GEORGE: Yeah (affirmative), under our fish resource permits, all the contractors working the Upper River, who are collecting fish, collect samples and they coordinate directly with the ADF&G lab to turn those in.

MS. KEEFE: And so -- so all of the -- all of the samples that we can, now that we have the swabs, the genetic swabs, we're able to sample every fish in the Upper River for genetics and send those swabs in.

Initially, when we started, I'm not quite sure how long it took, we were taking fin clips and we made a choice not to fin clip and PIT tag a fish, and take, you know, gut contents from that fish, and you know, expect it to live. So we rotated through with Chinook.

So in the beginning, it was a little bit slow. We got the swabs. Things started going much faster and they're getting all the samples. They're delivered on about a monthly basis. They don't like taking deliveries all the time, because they're, you

know, but we kind of save a batch and then we take that batch over for the lab.

Sometimes there are discrepancies in the numbers reported in the different studies. I think that has to do A) with lag time in, you know, we know how many samples we've collected to deliver to them. That's actually in our database. It's on our data sheets, because the genetic sample is marked, and the lab doesn't necessarily get those and process those right away, and there's also the issue of a small percentage of the samples being [in]sufficient to run analysis on. So you'll see different numbers in delivery than analyzed, right?

MR. HABICHT: Yeah (affirmative), there's only -- there's one other thing and that is that when we did the ISR, we had a cutoff date of September 15th, 2013, because we were having a hard time keeping -- adding to the numbers as we were writing the report. So we cut it off at that point and we, I believe, in 2013, we received samples after that date. So those would have been reported in other studies that would not have been reported in ours. So there's -- that's that lag, I think.

MS. WALKER: Yeah (affirmative), that's a good explanation. That helps, because the numbers don't -- they don't match up between the studies, and it's not clear if there were separate samples being collected for genetics that were different

from fish distribution and abundance.

MS. KEEFE: Well, there is...

MR. GEORGE: Yeah (affirmative), ADF&G sends their own crews out, as well, as targeted efforts and to those Upper River tributaries to collect genetic samples.

MS. KEEFE: Now, we incorporated that data into the fish distribution database that we obtained from ADF&G. So that is in the ISR. That slide I showed this morning of all of the sampling in the Upper River included points from the genetics team.

MS. WALKER: And then the samples of Chinook with freshwater age two-plus from the Upper River, have those been analyzed yet?

MR. HABICHT: I'd have to get back to you on that. I'm not sure which ones we analyzed that first preliminary analysis. The only ones we've analyzed are the ones that were reported in this preliminary analysis, at this point, but I don't know if those are included in that. I can get back to you on that.

MS. WALKER: So the samples that you've been -- have analyzed for genetic analysis are only up to -- or I don't mean to say only, but are up to September 15th,

2013?

MR. HABICHT: I'm not sure about that either. So the ISR, the Initial Study Report, has a cutoff date of September 15th, 2013, for samples that we had received, and that's what is reported. Then in our implementation plan, which includes that analysis, that analysis was done later, it was done in December or January, and then reported in March, in -- with that consultation, so there may be some samples in that preliminary analysis that are not reported in the original ISR. How is that for complicated?

MS. WALKER: Thanks.

MR. PADULA: Thanks. Any other comments, on the phone or in the room, on genetics?

**EULACHON RUN TIMING, DISTRIBUTION, AND SPAWNING IN THE  
SUSITNA RIVER (STUDY 9.16)**

MR. PADULA: Next up, Eulachon Study, Bryan's up again.

MS. KEEFE: Do you want me to drive, Bryan?

MR. NASS: I don't think so. Holy cow.

MS. KEEFE: You don't want people getting sick?

MR. NASS: Can I sit there? Thanks. Bryan Nass, LGL Alaska Research Associates. This is the timing, distribution, and relative abundance of eulachon spawning in the Susitna basin, combination of methodologies, including radio telemetry, sonar, and active catch to collect bio samples.

There were a handful of variances within this study in the field sampling and the key differences were basically to increase the number of biological sampling sites, the places that we were collecting lengths, weights, that kind of thing, and the addition of using visual observation, just spotting spawning sites, and while that seems totally legit, but the original plan was that radio telemetry and the use of multi-beam sonar would get us to these spawning locations, but when you get out there, it kind of looks like a herring ball when there's a lot of activity going on. So we also used that as a point at which to say, "That's a potential spawning site. Let's go do some measurements."

This is a map, albeit you may not be able to see it very well, but this is fundamentally Cook Inlet down here and this is about river mile 55 up here. Here's the Yentna coming in at about river mile 30, and there's three different types of points up here.

There's data on where the spawning sites are that are determined by visual or using multi-beam sonar. There's the [visual/sonar surveys] and those are the red ones. I can't see it either, and radio telemetry are the purple triangles, and underneath all of that are the historic sites that were tabulated or determined in 1984, I believe it was.

So the bottom line here that I'm kind of trying to show is that this is the distribution that we found for eulachon, and that the points overlap each other pretty significantly.

The migration period in 2013 was May 28th to June 16th, and the spawning sites that were determined range from about PRM 10.5 down -- up to about 53. So the bottom line is, is that between the 1980's and between what we saw in 2013, is that there was substantial overlap, not only between methodologies, but between those time periods.

AEA proposed in the ISR modifications. These were also the same kinds of things that we had as variances, but fundamentally, we aim to continue those things for the purpose of achieving the objectives of the study. Those key modifications, again, consistent with the mentioned variances, are collecting morphometric data at

multiple locations and also, with respect to the collection of sonar data at our fixed site, that would be the end point. When do we call the study over, and that has to do with a quantitative measure of two fish per minute seen on the fixed station.

So we did not collect any data in 2014. However, we did have discussions about where to go next with the eulachon study. These would be new modifications not in the ISR. So should I continue on this front? Fundamentally, I think it's very important that you understand that one aspect, based on that map that I showed you, is that we intend to eliminate radio-telemetry from the study because it didn't seem to provide us any additional information about what we were getting from sonar or from visual surveys, and in fact, to substitute, to redirect some of our efforts where we think it's more useful, we want to expand the visual and sonar studies downstream of 10.5, so that we might be able to identify where spawning is there.

Perhaps you understand from the ISR, the fixed sonar site, basically had eulachon's spawning at it, and so we'd like to get a little bit further down, in terms of understanding what that extent is for eulachon, and then another aspect, as per discussions related to the Cook Inlet beluga whale study, we're interested in adding this flow habitat assessment, using a wetted perimeter analysis to look at the



relationship between discharge and eulachon spawning habitat, and I'll have another slide here in a minute to talk a little bit more about that.

There was a decision point in the study plan and it basically had to do with how we were going to go about determining substrate. This is a picture on the left of a side-scan sonar and it was targeting the bank that you're looking at on the right in that photo.

This was, essentially, an assessment of the feasibility to use side-scan sonar to get at substrate composition. Fundamentally, the analysis is that side-scan sonar can give you a pretty good idea of what the substrate is when you identify a spawning location for eulachon.

However, from a field standpoint, just going and looking at what the substrate is and using grab samples that -- it's an easier method than setting up with sonar and doing the analysis and the rest of it. So for those locations that perhaps are deeper or more complex that we can't get in there for some reason, side-scan sonar will be a good utility, a good tool for us to implement if we need it, but we will only do so in those situations.

So the current status is that we have completed year one data collection. We

didn't collect data in 2014. So in 2015, the intent would be to conduct, basically as per the study plan with the modifications that we've talked about, using sonar and visual surveys, to document the eulachon spawning sites, go to those sites, collect the essential data about what the characteristics are, the substrate, the depth, the flow rate, that kind of thing, and similarly to what we did in '13, we will also go to other places, like we said, in approximately five locations to get length, weight, age type information, and then this one component, this has largely been driven out of the Cook Inlet beluga whale study, is to develop this spawning habitat flow model, and basically, what that's going to allow us to do, through a little bit of extra data collection, is that we'll be collecting empirical data at known spawning sites to develop a relationship between river discharge and bathymetric features and then applying that relationship over a range of flows using the open water flow model.

So this approach, fundamentally uses wetted perimeter as an index of eulachon spawning habitat availability, and so if you're -- if you know the Lower River and you understand a lot of the sediment there, what is the bathymetry at a certain location as the river goes up and down.

Where is it that eulachon are going to spawn, and so just looking at the data

from 2013, we know that during spawning, flows were extremely high. I think we almost reached 100,000 CFS and that's very different than the typical 30,000 CFS, and so where did the eulachon spawn?

Well, it seemed to be that they were going to do so wherever the conditions were what they like, and that was at a different elevation than it would be in a normal year. So basically, this is going to get at some of that. Phil, would you like to add anything to that?

MR. HILGERT: Only that you mentioned that the (indiscernible - speaking simultaneously)...

MR. PADULA: Phil, you're going to need a microphone.

MR. HILGERT: This is Phil Hilgert with R2. Bryan had mentioned that a lot of the 1980's data had a lot of overlap or consistency with the 2013 data, and in the 1980's, they, essentially, did a similar approach looking at changes in depth and velocity, the (indiscernible) approach at known spawning sites.

They concluded that [there was little effect between the availability of suitable spawning areas and project] operations between 35,000 and 105,000 CFS, but because they used the empirical approach, they really couldn't look at what are the

effects of flows less than 35,000 CFS. We'll be able to expand that range a little bit, so that if we get into an issue of what are [reservoir refill] effects during May and June, we have the ability to identify and quantify those effects, and so we're looking at a modeling approach that allows to extrapolate a little bit farther than what they did in the '80's.

MR. NASS: Thank you, Phil. That concludes our summary for eulachon.

MR. GILMOUR: I have a quick -- this is George Gilmour. I just have a quick question regarding the study. Is there a reason why you didn't look at the distribution of eggs as an indication of or indicator for where the fish -- the distribution to fish?

MR. NASS: That's a good question and I'm sorry, because I don't know the exact answer to that. However, it's something that we've talked about recently and perhaps, that's something that we need to revisit.

MR. GILMOUR: Yeah (affirmative), I guess in my mind, based on some limited experience that I've had doing technical work, I mean, that was a very easy way to determine the upstream extent of spawning in condition, without having to identify the individual fish, and you know, in our case, it was very difficult to find

the [spawning areas] of smelt, not the eggs (indiscernible - microphone distortion). So you know, that's something I'd like just to suggest that you evaluate. So thank you.

MR. NASS: Definitely taken.

MS. DOMINI GLASS: Is this on? This is Domini Glass. Just the first comment, he made some changes to the study that I think, in general, improved the study, and so I'm not going to get into those. One of the things, though, that you did was you said you'd removed the blocking weir because you -- you were getting spawning aggregations around it, and could -- I just asked a question that I'm being totally naive on this, I may be entirely wrong, but is there any possibility that the presence of ripples turns out to be an important habitat component?

MR. NASS: That's a really great observation. Okay, the blocking weir is a method to try to push fish out away from the transducer so that we can get a good image of them and basically count them, because, not only of spawning aggregations, it was because of the changing flows that we observed in 2013 that really hindered the whole process, just bulking up with debris.

Debris causes turbulence. Turbulence causes problems in the sonar. So it

was more than just the spawning aggregations, but your observation regarding the ripples and potentially causing spawning is really a good point, because there were definitely observations that, let's call it agitation, for example a boat wake or something like that, actually had -- almost seemed to induce spawning, so to speak, and so yes, I think that there are aspects of putting in a fixed structure and fish going to it, you know, it's like creating fish habitat.

So it's one of the reasons why we want to look a little bit further downstream, if we can. It's a challenge to find a good sonar site that will give us the right bathymetry so that we can actually see what's going on across the channel, similar to the Watana Dam site. So yes, point taken, and it will likely not be used, if we continue to see the problems that we did.

Fortunately, because of the [population size],-- numerically, there's just so many fish, and the pattern than we're looking for, the signature or the queue that we're looking for, is basically to look at timing of the run. That's the sole purpose of the fixed sonar and so if [that is the case, then] it really doesn't matter if there's some fish going behind it or whatever, it's what is going by. What is their rate? How many are there at a given point in time, and therefore, what is the [pattern of the

migration]-- is there a bell curve? It is bimodal, whatever, and so I don't think it -- that particular change really influences how we're going to interpret the data.

MS. DOMONI GLASS: Okay. I've got another question or comment that -- in the ISR, and I have not read the '14 document, by the way, in there, you talked about tag retention test, which was disconcerting, to say the best, control group, 65% died, the test group, only 27% died. This suggests that there's some sort of handling issue going on, and I guess I would question is -- well, it implies two things, 1) you're getting to figure out what it is that's going on and correct it, but it also suggests, and if you've got that kind of mortality, you may have to increase the number of tags you're putting out to meet your sample size, and I just wanted to know if you had any comments on that?

MR. NASS: Yeah (affirmative), those are good points, good observations again. Yes, you know, the point of doing a tag retention test is also to look at what the survivorship of the fish is. So we didn't have any problems with tag retention, per se, but obviously, people who are familiar with Eulachon, as you may be, [they are] a very sensitive fish, very sensitive species, in terms of handling.

We knew going into it, based on literature, that it was going to be a challenge

to stuff a tag into a fish that's very small. It's at the peak of its spawning capability and so energetically, it's already taxed. So it's a challenging time.

Basically, though, what I would regroup with, in terms of moving forward, is that if we were to use radio telemetry, I think it's still valid. Yes, you could increase the number of tags to compensate for mortality, but I think the question could be, also, did we get from the data what we needed to get to address the objectives, given the number of tags that we had dispersed, and the answer to that question would be yes, is that we did see tags dispersed from their tagging sites, downstream, upstream, across, stay in one place. We saw a variety of things and so despite the fact that there could have been substantial mortality in just the study, itself, of doing a tag retention test, has its own implications, I think that the data demonstrates for itself, if I go back to that figure, that there was widespread movement of our radio tags.

MS. DOMONI GLASS: Well, one -- another question here, and it just refers, you know, gets to the early sampling, and I know that this year was an odd year, in the '80's, they managed to catch an early peak that came through, you know, a month before you guys could get out there, approximately, and I just -- I mean, I recognize that there was difficulties with trying to get some sampling there and I just kind of



wanted to encourage you to think creatively about how to work around that, should it happen in the future, maybe we can work a little offshore and try to intercept these guys or figure out some way to try to capture that earlier part of the run.

MR. NASS: Yeah (affirmative), point taken, and the only thing that we know, based on 2013, is that there was sampling conducted while the ice was still in place to just look to see if there was eulachon present, and based on the sampling that we did, there weren't.

So that doesn't tell us a whole lot about whether or not we missed part of the run or did it all just go into one unimodal kind of migration? So point taken, it's definitely something that we would need to look out for again, perhaps just making sure that if we ran into an ice situation again, that we did, perhaps, more extensive sampling through the ice or something like that, just to document presence, absence, so yes, it's something to look at and keep in mind.

MS. DOMONI GLASS: Okay, I have one final comment, and I was going to ask about how the project was going to estimate potential project effects on eulachon, because as of the April meeting, the answer to my question was, we don't know. We know it's important, but we don't know what we're doing.

I'm presuming that what you presented here is a hint of what is going to be done in order to evaluate the project -- potential project effects on eulachon, and I just wanted to note that we haven't reviewed that, so we're not prepared to comment at this time.

MR. PADULA: Thanks, Domoni.

MS. KEEFE: Thank you.

MS. LESTYK: One more question, actually, for Bryan.

MS. KEEFE: Yes.

MR. PADULA: Yes.

MS. LESTYK: I know that we're not really focusing -- this is Keri Lestyk with NMFS. We're not focusing on the 2015 studies, but you did mention that you might be going below river mile 10.5, and since marine mammal permits potentially take a long time, I just want to throw the comment out that there's potential for harassment, not only of Cook Inlet belugas, but also harbor porpoise and harbor seals. Studies in 2013 showed 700 harbor seals in the study area during one survey. So I just want to point that out.

MR. NASS: Thank you.

MS. MCCRACKEN: This is Betsy McCracken with Fish and Wildlife Service, and I'm not particularly familiar with this study, but I'm just wondering if this study is -- or if some other study is looking at the potential changes to the habitat or the substrate that is necessary for the, you know, eulachon egg stocks to adhere to, or did you actually see any or is there any work on that being done?

MR. NASS: Good question. I'm not sure I can respond to that. So I'm going to look to my colleague.

MS. KEEFE: So yes, so geomorphology has a sediment study and they will be reporting on the changes in sediment in the river system.

MS. MCCRACKEN: So will it be related to or integrated or related to the eulachon study?

MS. KEEFE: Yes, the data will be available for us to use. If there are changes in sediment rates or sediment inputs down that -- in that distribution, then we'll have the information that they have to incorporate.

MS. DOMONI GLASS: Just want to note that the geomorphology study doesn't go all the way down there.

MS. MCCRACKEN: Yeah (affirmative), that's the question.

MS. KEEFE: And it doesn't go all the way to river mile 10, and Bill is in the back and maybe he can address why it doesn't go all the way to river mile 10.

MR. FULLERTON: I mean...

MS. KEEFE: You need a microphone.

MR. FULLERTON: Yeah (affirmative), that is a decision point in our study that we will talk about tomorrow, but based on the results of our modeling and analysis, that the potential project effects would be very [minimal] and so that was our criteria and we're not extending the model below 29.9, the 1-D model.

UNIDENTIFIED SPEAKER: So the answer is no.

MS. MCCRACKEN: So wouldn't they need to demonstrate that it wouldn't be impacting the spawning habitat down there, down in the Lower River (indiscernible - speaking simultaneously)?

MR. FULLERTON: Well, that's...

MR. PADULA: Bill, you're going to have to come closer and speak louder.

MR. FULLERTON: Okay, and that's in our -- the work that we did to come up with our decision point or make our decision, and we have some information that Lyle will -- can present tomorrow that shows the basis, plus we filed a tech memo

about three weeks ago that details that information.

MR. PADULA: Bill, could you also repeat or paraphrase your first response, because they didn't catch it all in the transcript, about the decision plan?

MR. FULLERTON: Okay, the decision point is in the Study 6.6 and it was to look at whether the model, the 1-D bed evolution model is extended downstream of river mile or project river mile 29.9, and we looked at results from our modeling and several other indicators in that and looked at what natural variability, what metrics for that, and decided that the changes in the project at that point on the hydrology, sediment transport, were such that the changes were extremely minor and so the decision is not to extend below 29.9, and like I said, Lyle, in his presentation on 6.6, if you want us to get into that information, he has some on that.

MR. PADULA: Thanks.

MS. MCCRACKEN: So I guess I'm not -- I don't understand, yet, if it's at the scale that's relevant to this fish habitat or not, if you can detect that with the modeling that you've done.

MR. FULLERTON: Well, the implication is the drivers, the hydrology, the sediment, that are passing Susitna station are such that the changes, potential for

change is extremely minor, and so that basically you will have a similar system as what you have now. It's similar to the year-to-year variability. Its sediments greatly attenuated by all the inputs and so is the hydrology that come in below the dam site, but Lyle's got the modeling and more detail on that, that we can discuss, I think probably more appropriately, tomorrow.

MS. MCCRACKEN: Okay, thank you. I'm just not clear if the 1-D modeling or if we need something more robust to assess this impact or whether there is an impact.

MR. DYOK: Can I reask Bill a different way? You are going to be modeling upstream of 29.9, is that not correct?

MR. FULLERTON: Correct.

MR. DYOK: Yeah (affirmative), so you will see in the region from river mile 29.9 to 53, what the changes in sediment are going to result in?

MR. FULLERTON: Correct, and what potential changes in bed elevation, both for existing conditions, as well as under project scenarios.

MS. MCCRACKEN: So that somehow quantifies where I'd be able to understand that?

MR. FULLERTON: I mean, we were trying.

UNIDENTIFIED SPEAKER: So the 2014 (indiscernible - distance from microphone).

MR. FULLERTON: In -- I mean, we have initial model runs and we can show you some of the results on what the changes in the hydrology, sediment transport, bed elevations are for both existing conditions and the OS, Operation Scenario 1-B, which is kind of a modified max load following.

UNIDENTIFIED SPEAKER: So...

MS. MCCRACKEN: And this study use -- and then your study, Bryan, is...

UNIDENTIFIED SPEAKER: Microphone.

MR. PADULA: Betsy.

MS. MCCRACKEN: So then your study is looking at the actual habitat of the egg stocks?

MR. NASS: That is correct. Yes, the study will identify spawning locations for us to look in, and then it will collect data at those spawning sites, so that we know what the depth is, what the velocity is, what the substrate is like where they are spawning.

MS. MCCRACKEN: Thank you.

MS. DOMONI GLASS: So this hydrology, the geomorphology, flow relationship we were just hearing about, is that in the tech memo for 2014?

MR. MACGREGOR: Yes.

MS. DOMONI GLASS: Okay, which we haven't had a chance to look at. Thank you.

MR. WOOD: Mike Wood, again. I've got a question about the -- so the tributaries of the Yentna, are you looking at the amount of eulachon that are going up the Yentna?

MR. NASS: We looked at the Yentna from the radio-telemetry standpoint that we tracked some tags into the Yentna.

MR. WOOD: Okay, is it important to know how many go up there, because it's going to be a -- I mean, just massive schools of them and then we'll discuss -- I just wondered, you know, a lot of them go up the Susitna, but then there's a huge bunch that peel off at the end, too, and in massive colonies, and I just wondered if that is part of the study?

MR. NASS: The Yentna is not a focus of the eulachon study, per se. If we



had radio tagged fish that went there, we certainly followed them, but that doesn't mean that we went up there to do sampling. To get to your question of whether or not that's important, I would have to turn that over to somebody else, because once they get outside the project effects area, they're gone.

MR. WOOD: Okay. The other question I had, and it kind of relates to two other things, is 1) is just the historical records of eulachon going way upriver and this would be up toward Talkeetna, and it appears, maybe, that you're not looking at (indiscernible - microphone distortion) that historical and if there's a reason for that, and who knows what that reason is, but there's that historical record, and second of all, that amount of seal traffic that -- all the way up beyond the Yentna, chasing those things, you know, that -- and I know it's probably a different study, but there's a lot of seals up there chasing those guys, and I don't know if that's actually been reported.

MR. NASS: Yeah (affirmative), the 1980's, the 1984 data series that we have when we plotted on the map, goes up to about project river mile 53. So if there's other information that shows eulachon beyond that, I'm not aware of it, personally.

MS. DARA GLASS: So this is Dara Glass, and so my prompt at this question

and this is Dudley's favorite question that comes from me, so you've done your scientific study. Have you talked to anybody that lives on the river itself and asked them the question of how far they've seen eulachon come up the river? Have you included that in your database?

MR. NASS: I can't say that we've included some sort of creel survey or information gathering on our study. If there is some place, Betsy, maybe you can indicate. Okay, so no.

MS. DARA GLASS: Okay.

MR. NASS: Except that, I will indicate that our staff, while they are in the field, definitely communicate with locals, including the people that they stay with at Alexander Creek Lodge, when we were there in 2013. So we've got a good rapport going there of a lot of local information. It's an exceptional way to get to the heart of where fish are, what they're doing, what the patterns and trends are. I can't say, though, that we – [that] anybody asked the question, "Have you ever seen fish above PRM 53?" I doubt it.

MS. DARA GLASS: I would ask that you do and -- because it's a very important component of the data gathering and could make a difference.

MR. NASS: Thank you.

MR. PADULA: Any other comments or questions on the eulachon study?

**COOK INLET BELUGA WHALE STUDY (STUDY 9.17)**

MR. PADULA: Okay, last, but not least, Cook Inlet Beluga Whale Study.

Darren, are you on the phone?

MR. IRELAND: Yes, can you hear me all right?

MR. PADULA: Yeah (affirmative), not bad. We'll cue up your presentation.

There it is.

MS. KEEFE: Darren, this is Marylou.

MR. IRELAND: Marylou, I suppose I'm at your mercy here.

MS. KEEFE: Yes, I'm going to drive for you.

MR. PADULA: Yes, she's driving.

MS. KEEFE: But I have a different mechanism. So it will go a little more smoothly. So we're going to start with your intro slide and then we'll go to variances.

MR. IRELAND: Yes. All right, are you ready?

MS. KEEFE: Yeah (affirmative).

MR. PADULA: All set.

MR. IRELAND: All right, yes, so this is Study 9.17 Cook Inlet Beluga Whale, I'm Darren Ireland, the current Project Lead on this with LGL Alaska. So yes, do you want to jump to the variances and go through those?

The first couple are relatively minor. The RSP mentioned that there was (indiscernible - interference with speaker-phone) estimating that (indiscernible - interference with speaker-phone) in the project...

MS. KEEFE: Excuse me, Darren, can you start over and can you please speak up? We're having a hard time hearing you.

MR. IRELAND: Certainly, is this a little better?

MS. KEEFE: Yes.

MR. IRELAND: All right, so the -- yes, the observers did not record any angle measurements to beluga sightings during aerial surveys. Basically because that angle [measurement is used for estimating animal densities during line-transect survey and these surveys were not intended to provide density estimates, the angle measurement] is not required to analyze the data for this kind of study.

So the second variance there [relates to text in] the RSP [that states that]

independent counts by the observers [would be made and then] the median of those counts would be taken as representing the number of beluga whales in that group.

The observers determined during the field season that [it was more representative to independently count the number of individuals in sighted beluga groups and then] discuss each other's [counts and agree on a] best count [to represent that group].

So the third variance really is the biggest one here, and it relates to the video cameras that were installed at river mile six that we installed on June 24th and July 12th, but the live-feed video function of those cameras was not operational until September 25th.

A little bit before that, from September 13th through September 24th, the video cameras were operating and [although not remotely controlled so the view was just fixed at a wide angle setting and the data were] stored to a harddrive that was reviewed later [so there are video data from the] September 13th to the 24th period.

Also, there in early September, September 3rd to October 17th, the -- a couple of still cameras were operating at the video camera location, collecting still images every five seconds during that period of time. We got a little additional data that way, which was not in the work plan.

The last variance there, essentially relates to the water surface elevation modeling objective and [work on] that objective was deferred until a later year's study.

All right, yes, [that is the slide I thought you were going to bring up], modifications to the study that were included in the ISR, and essentially, part of the ISR submission in June included a modified revised study plan that included methods [intended to collect] better information was [on beluga whale group size and composition as well as beluga whale prey and habitat relationships] in the river delta and those methods were tested eventually, in 2014, and although they collected some useful data, there were some issues, you know, [related to] weather conditions that are [limited times when sonar data on beluga prey could be collected as well as concerns related to operating the survey vessel when whales were present,] so it was determined, that essentially, those modifications did not [work well enough to] be carried forward to 2015.

So the study modifications, really, that are intended to be carried forward in 2015 are part of the implementation plan that was submitted in September, and you know, I realize that plan has not been, you know, reviewed by folks yet, so I guess I

won't really wade into the details of that plan, but basically, [the modifications described in the ISR have been further] modified [by what is in the implementation plan submitted as a technical memorandum in September-- the modifications [proposed,] both in the revised study plan as part of the ISR and then later in the implementation plan. They don't really, you know, alter the major objectives of the study or the time -- the timing of the study or the study areas and so on.

It will change the little things. They're really just changing the methods to collect data that are going to help better answer remaining questions and achieve the objectives of the study. So I guess I -- I don't think there's too much more.

The next couple of slides are [descriptions of modifications] that are largely connected to the implementation plan as part of the (indiscernible - interference with speaker-phone) [September tech memo filings]. So you could jump to -- yeah (affirmative), I think slide 15 or yeah (affirmative).

We will, essentially, you know, the first couple of bullets here describe the current status of the project and that is that the aerial surveys conducted in 2013, as well as some other research activity that occurred [in the area provide us good information on the distribution and timing of beluga whale use of the delta]...

MS. KEEFE: Keep your -- please, Darren, please keep your voice up. You're fading a little bit on us, sorry.

MR. IRELAND: Sorry about that. The 2013 aerial surveys, as well as other research ongoing with beluga whales [in the area by other projects and researchers], I think gives a pretty clear understanding of the use of the -- of this [part] of the delta area by beluga whales and so [we do not] intend to do anymore aerial surveys or vessel-based surveys that were tried in 2014 to document that distribution timing of the use of that area.

The other couple of bullets down there, essentially [get] into some of the proposed methods in the implementation plan for [2015 that] replaced the [modified revised study plan methods included in the June ISR submission, such as replacing camera stations] which were not very effective in 2013 with actual visual observations [from the shore].

So I think with that, as well as the modeling that was just previously discussed as part of the eulachon study in [2015 designed] to look at water surface elevation changes and their potential impact on eulachon spawning habitat (indiscernible - interference with speaker-phone) for beluga whale and then get at the third objective



of the water surface elevation modeling that is described in part of this study. So I think that pretty much covers it.

MS. LESTYK: This is Keri Lestyk with NMFS. I just want to make a comment about the -- in the ISR, there's actually a misrepresentation about the dates from the revised study plan. The ISR states that the plan was going to go from May to October. However, the revised study plan says from mid-April through the end of October, and that's a difference of six weeks, and especially the late April, early May when the eulachon runs are going on, that's an important time for beluga whales and to document them in the area, and that was missed in 2013, and again, the ISR misrepresents that.

MR. IRELAND: Thanks, Keri, was that [regarding] (indiscernible)? I had a little bit of a hard time hearing you on the front end. Does that relate to the camera stations?

MS. KEEFE: No, it relates to a late breakup.

MS. LESTYK: But aerial surveys wouldn't be affected by ice breakup. You could still do aerial surveys. We do know that beluga whales are under the ice during wintertime and so if there are leads, you may be able to see something.

MR. IRELAND: Okay.

MS. MIGURA: Good afternoon, this is Mandy Migura with NMFS. I just wanted to -- looking at the objectives and the 2013 studies, make a comment that it doesn't appear to me that there was actually a really good observation for objective two.

I think the aerial surveys did a good job of documenting group size as best as they could, but I think there was some lacking in obtaining data on group composition, and I know that's a little difficult from the aerial surveys and that was something I had pointed out, and I understand the intent was to try to get that information from the cameras, which unfortunately, there was some complications in getting those cameras up and running, and then the other thing on that objective I'd like to point out, is that there has been a strong emphasis of foraging behavior, but there seems to be a general lack of information regarding reproductive behavior, and again, I know that was something that these video cameras were going to try to help.

So I'm just wondering, going forward, how is that -- or is that something that is going to be -- tried to be captured in absence of conducting the aerial surveys, in using the cameras going forward? Thank you.

MR. IRELAND: So yes, the first part of your question relates to [objective number 2 which is about documenting] group size and group composition. Yes, I think your comments regarding some of the limitations related to documenting that information from aerial surveys, especially [when they were] conducted a 1,000 feet and so on, is well taken. That was part of the [reasoning] for revising that to the boat-based method that was tested in 2014.

So I think some discussions with [you and others] on this topic and alternative methods [that could be used to collect these] data, you know, I think there was a good discussion around the costs and benefits of going out for that information, in terms of potential impacts from [conducting that] research on the animal and I think it was -- my impression, anyway, I guess, is that some of the other research going on [in the area can provide the group composition information, since] that type of information [for this] area is being collected by others and it probably [doesn't need to be repeated by us,] but that objective is a good question.

Related to reproductive behavior, yeah (affirmative), I think, my understanding of [what we know] regarding just what that behavior is and what the features of the habitat [are that are important] for the whales and so on, and I think,

certainly, you know, [what is known is quite limited and some] observations in the Lower River could help inform whether or not any of that type of behavior might be [occurring] in the river.

MS. MIGURA: So I just -- one clarification, Darren, for the group composition, the other studies that are opportunistically collecting this, are they actually recording when they're seeing belugas or other marine mammals in general, are they recording, not only, you know, the presence/absence, but they're recording the numbers and the group composition and behaviors, is that standard protocol?

MR. IRELAND: Of the other studies, you're asking?

MS. MIGURA: Right, you indicated that the group composition would be in part captured by some other studies that document opportunistically, sightings. So are they recording information, the detailed information, as well, or are they just reporting there was a beluga sighting?

MR. IRELAND: So the other studies, as part of this -- the ILP process, the beluga study, you're mentioning here? I just want to make sure we're talking about the same study.

MS. MIGURA: I was referencing your comment that some of the other

studies. So this might be a better question for Betsy or somebody else.

MS. KEEFE: I think she was referring to the studies you mentioned that may be collecting information, other studies collecting information on beluga in the delta area.

MR. JAYJACK: Other than AEA.

MS. KEEFE: Other than the ILP study that we're talking about today. So we know, for example, LGL is doing some identification studies.

MS. MIGURA: Okay, that's what I wasn't clear on, if you were talking some of the other 50-some odd studies for this project or if the comment was made, other studies not relating to this, and then if that's the case, then is -- are there agreements to work with some of these other groups, non-project related groups who are collecting this data, are there agreements in place to do that data sharing already?

UNIDENTIFIED SPEAKER: Is it Apache?

UNIDENTIFIED SPEAKER: (Indiscernible - distance from microphone).

MS. MACGREGOR: We started to work with Apache last year to pool our data together. Our data is available to anyone who wants to use it. We don't currently have a data sharing agreement with LGL and the work they're doing, but

we would be more than happy to.

MS. MIGURA: Yeah (affirmative), I agree -- recall that you had mentioned at one point in time you were in discussions with Apache, but I wasn't aware if that's been finalized and they are sharing data, and that you are using that data for this process.

MS. MACGREGOR: It hasn't been finalized, but we'd be happy to incorporate their data, as well, as existing information. Our data is readily available.

MS. MIGURA: Okay, so I guess then, that goes back to the question regarding group composition, if there is not an agreement already in place or any certainties that these other non-project related studies are collecting this data, how are you going to get group composition information? Is this going to be data mining from some reports that are published or what's the plan?

MR. IRELAND: Yes, I think there are reports [that are publicly] available that describe the composition information for the beluga groups that are present in the delta for [this time of] year, so like in this -- from the photo ID study (indiscernible - interference with speaker-phone).

So I think that information (indiscernible - interference with speaker-phone)

can be used to help describe the groups and the composition of those groups that are present there in the delta.

MS. MIGURA: So to clarify then, you will be going forth and using data from other projects not related to this project to obtain the group composition component for meeting this objective?

MR. IRELAND: Right, yes, that would be -- my intent would be to use other information available from other studies, whether it's in published reports or whether it's [from] future [data sharing agreements,] to help inform group composition information or the objective of this study, yes.

MS. MIGURA: Thank you for clarifying.

MR. PADULA: Yes, do you have a microphone?

MR. PHILLIPS: Guy Phillips, Kier Associates. My question relates to the third study objective that describes developing a model to describe the relationships between the various other things of concern, and I'm wondering when you are planning on doing that, how you are planning on doing that, and when we might see something about how you are intending to do that?

MS. KEEFE: That model was discussed in 9.16 in eulachon study. Phil

talked a little bit about it. Bryan mentioned it. It's focused primarily on eulachon and that is the model that's referred to in this bullet. It's for eulachon as a foraging -- as one of the species that beluga whales forage on.

MR. PHILLIPS: And what about the various other relationships on the river?

MS. KEEFE: Those will be incorporated in that model. I...

MR. PHILLIPS: So it will be one model encompassing all of that?

MS. KEEFE: Yes.

MS. DOMONI GLASS: Domoni Glass again, just for clarification, the final study plan refers to a water surface elevation model. It also refers to gathering information from Sections 9.7, 9.6, 5.5, 5.6, 6.8, 6.6, 8.5, and incorporating all that information somehow or another to be able to evaluate the project's potential effects on whale habitat and prey, including salmon, and to date, we haven't seen any detailed information, or I haven't, anyway, on how that analysis is going to be done, and I'm wondering if that we might be seeing that soon and if -- I think -- I think it's important to be figuring that out soon, to make sure you've collected all the data you're going to need to support that assessment.

MS. KEEFE: So I just put up the proposed study modifications in the ISR,



and in Section 7.1.2.4, is a description of the modification proposed for the study methods related to the water surface elevation model, and that is, that model will be replaced by stage height measurements and modeling performed by instream flow study and wetted perimeter analysis incorporated in 9.16.

MS. DOMONI GLASS: The instream flow study doesn't go down that far.

MS. KEEFE: There -- there are -- Phil, do you want to come to the microphone? There are...

MR. HILGERT: This is Phil Hilgert.

UNIDENTIFIED SPEAKER: You've got to go closer.

MR. PADULA: Yeah (affirmative), you better...

MR. HILGERT: This is Phil Hilgert with R2. The instream flow model will develop a -- well, part of the instream flow model is an open water flow routing model, which will extend down to river mile 29.9, with [recording] pressure transducers at transects that are identified as eulachon spawning habitat, develop a relationship between the input of the -- the output of the open water flow routing model at river mile 29.9, which translates project operations from the dam down to river mile 29.9, and then develop a relationship between 29.9 and the pressure

transducers at those eulachon spawning habitat [transects].

We expect that eulachon spawning habitat transects to be down in the Lower River. What we're trying to do is identify areas that were spawned in '82 and '83, and again in 2013, potentially, also 2015, so we have areas that are consistently used for eulachon spawning and put the transects at those locations and develop the relationship between those locations and river mile 29.9.

MS. LESTYK: This is Keri Lestyk. I would just like to point out that, not only do we have to look at impacts directly to belugas, but also critical habitat, and critical habitat goes from the delta upstream to river mile 8.6. So I guess that's where some of our concerns are, that the model at river mile 29.9 might not accurately be able to reflect impacts to critical habitat.

MS. KEEFE: So this, do you want to speak to the -- slide, Phil.

MR. HILGERT: I'm looking for Lyle.

MS. KEEFE: He ran out.

MR. HILGERT: I think they're going to put in some pressure transducers below the tidal influence zone and we'll be looking at stage changes in the tidal influence zone.

I thought at the last meeting with Darren that we were talking about that, because the eulachon spawning habitat [model will] look [at relationships between] the open water flow routing model [and] where [the eulachon] transects, but those transects are not in that lower tidal influence zone.

One of the effects of the project is to look at changes and stage from the dam downstream. As soon as you start getting into the tidal influence zone, stage changes from the tide exceed the stage changes associated with the project operations. So it's kind of a de minimis effect as you get down into that tidal influence zone.

MS. KEEFE: That's -- that's what we talked about at the meetings that we had.

MS. LESTYK: So just to make sure I'm clear, you're putting the pressure transducers below the 29.9?

MR. HILGERT: Yes.

MS. LESTYK: And so if that's the only thing that's being measured in that area, how is that going to be incorporated to a model where there's so much other data from 29.9 upriver? I guess I don't see how...

MR. HILGERT: Okay, so the output from the open water flow routing model gives you stage changes on an hourly basis [from the dam downstream] for various water years. We then look at, what is that effect of stage changes at river mile 29.9, to stage changes that are measured at those eulachon spawning areas.

We'll put in pressure transducers that will track that stage on an hourly basis, and then you'll be able to develop a relationship between stage changes that were observed over a range of flows at the eulachon spawning transects, to the output of the open water flow routing model at river mile 29.9. So we'll be able to look at [the effects of] project [springtime] operations for those water years, you can then track to see what changes [they] would have at those eulachon spawning habitat [transects] below river mile 29.9.

UNIDENTIFIED SPEAKER: (Indiscernible - distance from microphone).

MS. WALKER: What will this correlation between river stage and eulachon spawning mean? It doesn't sound like anything other than a correlation. There are so many other factors that go into eulachon spawning. Could you just generally explain what the thought is behind measuring this relationship?

MR. HILGERT: It's not just stage, but stage is a major effect of project

operations; at least based on the -- what I've read in 1980's and 2013, those eulachon are going up along cut banks and spawning along those cut banks in areas of [higher] velocity. They spawn in areas that are generally less than five feet deep.

As we looked at where those fish were spawning at high flows in the spring of 2013, the assumption was that those fish were moving with that stage and looking at areas that had potential spawning habitat, which was defined by velocity, substrates that are suitable for spawning, which are typically sand and smaller gravels, and also the adequate depth.

They don't tend to spawn in really deep water. They avoid areas of low velocity or no velocity. So what we're looking to see is, as that river stage changes, does that potential spawning habitat change with that change in flow or do we get into an area where we start dewatering areas that were potential spawning habitat, that had potential substrates and velocities and depths, and now, we're getting into areas that simply don't provide that same type of habitat.

That's why we -- we looked at the -- the genesis of this was kind of a wetted perimeter type of approach, which looks at changes in those suitable conditions, along the edges of those transects. It's -- if you look at the 1980's studies, they kind

of did the same type of thing, but rather than doing modeling, they simply looked at an empirical approach.

MR. WOOD: Okay, I know it's the end of the day. This is Mike Wood, and we're talking about whales. So how does that affect the dam way the heck up there. So I'm down here at the mouth of the river for months on end, set netting for the same salmon that those beluga are going after, and those beluga, you know, we're talking about eulachon, but those beluga are down there eating the same salmon that we're going after and we'll be sitting out there and those beluga will be 10 feet from our boat, the gray ones, the white ones, all day long.

There's a lot of them out there and they're going all the way in the mouth, quite a ways, you know, I think your circle is somewhat indicated, but there are (indiscernible - microphone distortion) where you had the camera located was a pretty poor location. I think you should have a better spot next year, and it's not hard to be out there, again, to see whales. They're everywhere.

In fact, I was out there about five days ago and saw belugas swim way up the [mouth of the] river, I suspect chasing coho, but I'm just an observationist.

At any rate, that's -- the effects the operations of the dam will potentially have

on the beluga, I think, are pretty real, when I'm fishing for those fish down there that they're going after. In July, August, and September, they eat fish. So I think there is a good correlation between what could happen under project operations with what would happen to beluga whales. Thank you.

MS. MIGURA: This is Mandy Migura with NMFS, again. I just wanted to point out on slide four, where it talked about variances, I know that there are actually a few more variances in regard to the aerial survey implementation than what's listed here.

Some of them include variations in the timing of the surveys and the coverage area. One of those is that the plan indicated, at times, it would go 50 miles upriver to check the upmost extent potential. I did not see that he went that far up. I think 15 was the general ballpark, and also, we had some discussions early on about this, but where the surveyed area was not actually covering the area required in -- by FERC, the coverage zone. So that was has been -- we did address that one with you and I indicate that, but it was early on, a variance in that regard.

Then, I just a quick, two quick questions for Darren. We didn't go over these slides, but it's just an interpretation question, I think. On slide six, when it's talking

about the video was recorded September 3 through 24 at project river mile six, it says there are seven sightings, likely the same group on September 20th, however in the ISR, it looked like there were seven individuals.

So I'm wondering about the seven sightings, likely of the same group, that to me, suggests there were more than seven individuals. So I'm just wondering if this is the typo or if the other one was the typo, and then the same thing for the two sightings, the report indicates and the table reports that it was two individuals.

So I just wanted to -- and I don't need a clarification right now, but I just think it would be good to figure out where the discrepancy is, you know, because it's seven individuals on one sighting is different than seven sightings of likely the same group. So I'm not quite sure what that means.

Then on the map on slide nine, it's go the marine mammals that were identified and the -- let's see, this was the 2014, and I'm just wondering, it says, unidentified seal. Is that definitely a seal or is it possible it was a sea lion? I think that's just -- if it's a sea lion, that might be another endangered species, and that's just something I wanted to clarify, if it wasn't a harbor seal, which is indicated on the map, if there was any anticipation that it could be a sea lion, and that's all I have.



MR. IRELAND: Okay, yes, thank you, and you know, my recollection of the data from [talking with the observers] was that no, no sea lions were observed, but can certainly double check the data and can confirm that.

MS. KEEFE: That sounded like a sea lion.

MS. DOMONI GLASS: I just wanted to make one final comment. So far, you've talked about how you're going to link the project effects to beluga whales and vice versa, and you talked about water depth, and the beluga whales could potentially be impacted by changes in access, due to changes in geomorphology and ice. They can certainly be affected by changes in the abundance of salmon and hence, all the comments regarding salmon studies that are going on today and will be going on for the next two days, also apply to beluga whales.

So we're still interested in figuring out how you're going to make all of those linkages to all the various aspects of beluga whales and their habitat.

MS. KEEFE: Thank you.

MR. PADULA: Thanks, Domoni. Any other comments on this study?

MS. WOLFF: This is Whitney (indiscernible - distance from microphone)

Talkeetna Council.

MR. PADULA: Can you come up, please, and...

MS. WOLFF: Sure. This is a really quick question (indiscernible - distance from microphone)...

MR. PADULA: I just want (indiscernible - speaking simultaneously)...

MS. WOLFF: I just wanted to clarify -- okay. I just wanted to clarify -- this could either be for Darren or for Betsy, when you do get the arrangement with Apache, it would be good for licensing participants to know that has a spotter (indiscernible - microphone distortion). I know that was a discrepancy in the TWGs last year. So that's it.

MR. PADULA: Thank you, and Becky.

MS. LONG: Yes, to follow up on what Domoni said, are you going to have to make linkages between all the studies on beluga whales because it's an endangered species? If it's not in the ILP study, you're going to have to do it under NEPA?

MR. IRELAND: Correct, yes.

MR. PADULA: Any other comments? Thank you. Wayne, do you have something?

MR. DYOK: Just before we do...

MR. PADULA: Closing?

MR. DYOK: First of all, Steve, thank you for keeping us right on track on almost every single study, great job. I also want to thank all of the presenters. It's not an easy job being up there presenting. I think you all did just a great job, but most importantly, I want to thank everybody, all the participants here for being so prepared with your comments.

You clearly have reviewed the materials and I think that's great, because it allows us to do, you know, the best job possible, because we're all in this together trying to get the, you know, good science at a reasonable, you know, cost, obviously, which I have to be concerned about, but I think you all were extremely prepared and thank you, and I look forward to two more productive days this week and then three next week.

MR. PADULA: I thank you also. I really appreciate it. We had some technical challenges. We'll see if we can make some improvements overnight. We'll come back tomorrow. Those who are interested in glacier and runoff changes, geomorphology and fluvial geomorphology, water quality and the groundwater study, we'll start again at 8:30, and we'll target being out of here at 4:30 tomorrow. I

look forward to seeing most of you. Thank you. Thanks to the folks on the phone.

I appreciate it.

5:00:12

(Off record)

**SESSION RECESSED**