STUDY DISPUTE RESOLUTION PANEL MEETING

AND

TECHNICAL CONFERENCE

LA GRANGE HYDROELECTRIC PROJECT NO. 14581

Held at:

Holiday Inn Sacramento - Capitol Plaza

300 J Street

Sacramento, California

Tuesday, March 31, 2015

9:07 a.m. - 12:40 p.m.

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Reported by: CAROLE W. BROWNE
RPR, CSR NO. 7351

PANEL MEMBERS

NICHOLAS ETTEMA
Federal Energy Regulatory Commission

JONATHAN AMBROSE
National Marine Fisheries Service

RICHARD E. CRAVEN
Independent Third-Party Panelist

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PARTICIPANTS

FEDERAL ENERGY REGULATORY COMMISSION
Jim Hastreiter

NATIONAL MARINE FISHERIES SERVICE
Larry Thompson
John Wooster
Tom Holley
Steve Edmondson

HDR
John J. Devine

TURLOCK IRRIGATION DISTRICT
Steve Boyd

MODESTO IRRIGATION DISTRICT

Joy Warren

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ALSO PRESENT

Anna Brathwaite (MID)

Arthur Godwin (TID)

Monica Gutierrez (NMFS)

Jonathan Knapp (CCSF)

Bill Paris (MID)

Rhonda Reed (NMFS)

William Sears (SFPUC)

Chris Shutes (CSPA)

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APPEARING TELEPHONICALLY

Kathryn Kempton (NOAA)

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Tuesday, March 31, 2015, Sacramento, California

9:07 a.m. - 12:40 p.m.

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PROCEEDINGS

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MR. ETTEMA: All right. We'll go ahead and get started. My name is Nick.

Just a few logistical things. The bathrooms are right outside this door. Sign-in sheets are on the table outside, and there's two sign-in sheets at the back of the room here. Make sure you sign in today for the record.

There's also a series of handouts at the back. It has our agenda and questions from the Panel, things of that nature.

I'll go ahead and start with an opening statement.

MR. HASTREITER: Can we go around, Nick, and introduce folks?

MR. ETTEMA: Yeah, we're going to get to that.

MR. HASTREITER: Okay.

MR. ETTEMA: I figured a few folks might be a little late, might filter in yet, so we'll just start with this.

MR. HASTREITER: Okay.

MR. ETTEMA: The technical meeting of the Study Dispute Resolution Panel for a study dispute filed by the National Marine Fisheries Service, NMFS, in the La Grange Hydroelectric Project licensing proceeding is now open.

The dispute regards what studies are required in the preparation of an application for an original license by the Turlock Irrigation District and the Modesto Irrigation District, or the Districts.

I'm Nicholas Ettema, the Federal Energy Regulatory Commission's representative to the Dispute Panel and the Panel Chair. The other panelists are Jon Ambrose from NMFS, NMFS' representative, and Richard Craven, the independent third-party member of the Panel.

Background information on the Panel is provided for viewing near the water cooler at the back of the room. If you'd like a copy of this information, please let me know.

In summary of our background information, Jon Ambrose is a fish biologist with over 15 years of experience at NMFS. I, too, am a fish biologist and have worked at FERC for two years. Prior to FERC I worked on the Inyo National Forest. Jon and I were selected to serve on this Panel because we have not had

any involvement with the La Grange Hydroelectric Project prior to the dispute filing.

We selected Richard Craven to serve as the third Panel member. Richard has over 30 years of environmental consulting experience primarily focused on evaluating impacts of hydroelectric development on aquatic resources. Richard also served as the third Panel member for study dispute regarding the Don Pedro Hydroelectric Project. Richard, Jon, and I do not believe this past experience would bias his interpretation of the study request or recommendation in any way, and Richard's signed statement of impartiality is included with the rest of the handouts today.

The purpose of the meeting today is for the Study Dispute Resolution Panel to gather information it needs to make a finding with respect to the information or study requests in dispute concerning the extent to which each criteria set forth in Section 5.9(b) of the Commission's regulations is met or not met and why and make recommendations regarding the disputed study requests based on its findings.

Section 5.9(b) refers to the section of the Commission's regulations that list the criteria for studies necessary to prepare a license application. As a panel, we have carefully assessed our role and the

context for our work. The regulations make it clear that our recommendations are to be based on the criteria set forth in 5.9(b). Further, when considering the recommendations, the Director's determination will be made with reference to the study criteria in 5.9(b) and any applicable law or Commission policies and practices.

The Panel has reviewed the study dispute and developed a meeting schedule and a set of questions that aim to focus the discussion today on the information that we need. The Panel intends to ask meeting participants any questions the Panel may have with regards to the matters in dispute during today's discussion. During this period, the Panel insists it only receives information from the meeting participants, that is, NMFS, FERC, and the Districts.

The Panel will only receive information that the Panel deems is consistent with the Statement of the Meeting Purpose or as the Panel otherwise deems necessary to inform its determination. Examples of acceptable information include comments clarifying study goals and objectives, clarification of nexus between project operation and effects, scientific and technical rationale for why the additional studies or information are warranted, or other such information with reference to the study criteria.

We commit to NMFS, and the Commission project staff, as parties to this dispute, and to the Districts as the applicant who will carry out the studies, that we will give them each time for a closing statement at the end of the meeting, if they wish to use it. If we have time, we'll invite others to make additional comments or ask questions prior to the closing statements. If necessary, the Panel will adjust the schedule, depending on the pace of the meeting.

We reiterate the importance of sticking to the study criteria and to the single study request that is in dispute. We ask everyone to be as concise and focused as possible. And, of course, we expect everyone to be treated with respect.

Richard will go over the handouts provided to you today and then we'll begin introductions. After that, we'll allow the participants to make an opening statement if they choose.

MR. CRAVEN: Thank you.

I believe you have the technical conference agenda, and take a look at that to see what is anticipated today.

We'll take a break about 10:45 and we'll adjourn at 1:00 unless there are additional discussions that need to take place, and I believe the chairman is

open to adjusting the schedule as needed to accommodate whatever additional questions or discussions need to take place.

As Nick indicated, we're looking at 18 CFR 5.9(b), the study request criteria. There are seven study request criteria. And these were developed by FERC a number of years ago to develop a clear understanding of what a study is, of what information is needed, and why it is needed.

And basically, we have to adhere to these in our evaluation of the project. And, in summary, it's, you know, the seven of them basically are describing the goals and objectives, development resource information as appropriate, any public interest that might be considered, existing information, any nexus between project operations and effects, and how the study effects or results would inform the development of license requirements. And that's the big one for us, I think, Item 5, No. 5; and also No. 6, explain how any proposed study methodology is consistent with generally accepted practices in the scientific community. And No. 7 is consideration of levels of effort and cost as applicable.

The expectations of the Panel, we're pretty regimented on that, of course, and I believe we have

that handout also. There's six items there. And basically we're trying to find out if the -- each information request has met the -- met or not met the FERC requirements.

And we're trying to stick with the criteria. We don't really vary from the criteria. We can't bring in other criteria to try to consider the project. And we're limited to our expertise in making the decisions or recommendations. And we're to act independently and we're to share any information that we might gather with other Panel members in helping make a decision. And we're also prohibited from refraining -- we are to refrain from distributing any notes, information, or anything. So thank you.

Jon, do you want to go over the questions?

MR. ETTEMA: I think we'll do the introductions first, I think. Why don't we start with NMFS. We'll go around the whole table, and then we'll go to the observers in the back of the room afterwards.

MR. EDMONDSON: Okay. I'll start off. I'm Steve Edmondson with NMFS.

MR. WOOSTER: John Wooster with NMFS.

MR. THOMPSON: Larry Thompson with NMFS.

MR. HOLLEY: Tom Holley with NMFS.

MR. HASTREITER: Jim Hastreiter, Federal Energy

Regulatory Commission.

MS. WARREN: Joy Warren, Modesto Irrigation District.

MR. DEVINE: John Devine, HDR, consultants to the District.

MR. BOYD: Steve Boyd, Turlock Irrigation District.

MR. ETTEMA: Okay.

MR. WOOSTER: Maybe on the phone?

MR. ETTEMA: Oh, yeah. On the phone, please.

MS. KEMPTON: Hi. I'm Kathryn Kempton with NOAA, general counsel.

MR. ETTEMA: Okay. Thank you. Then can we start in the back of the room?

MS. GUTIERREZ: Monica Gutierrez, NMFS.

MR. PARIS: Bill Paris, P-a-r-i-s, with Modesto.

MS. BRATHWAITE: Anna Brathwaite, Modesto Irrigation District.

MR. GODWIN: Arthur Godwin, counsel to Turlock Irrigation District.

MS. REED: Rhonda Reed, National Marine Fisheries Service.

MR. SEARS: Bill Sears, San Francisco.

MR. KNAPP: Jonathan Knapp, San Francisco.

MR. SHUTES: Chris Shutes, California Sport Fishing Protection Alliance.

MR. ETTEMA: Okay. Thank you. And then just one additional item. I believe it was on Friday, myself and some others received an email about a rehearing request regarding a different study.

Just to clarify for everyone in the room today, the Panel will not be considering that study. We won't be making any recommendations with regard to that study request.

And then just some other things. You know, we can -- there's some people in the next room that are talking somewhat loudly, we can definitely hear them, but if we could all just sort of speak up and just make sure that Carole can hear you for the record.

And the first few times that you speak, if you could state your name before you go, that would be great.

And now I'll open it up to opening statements.

NMFS, would you like to go first?

MR. THOMPSON: Larry Thompson, NMFS.

Good morning. In preparation of our opening remarks for today's technical conference, NMFS reviewed the regulations pertaining to the study phases of the integrated licensing process. We wanted to better

understand the purpose of a study dispute and how it functions. We trust that the FERC lead panelist has also gone over the study dispute rules and regulations with the agency and independent panelists. Obviously, you've done so, and it's a really good introduction, I thought.

We did not find anything in the regulations allowing the Commission to determine, prior to a study dispute conference, that a dispute with respect to a study pertaining directly to the exercise of an agency's Federal Power Act Section 18 authority will not be considered by the Panel.

So we just want to make the point here today that we came prepared to discuss NMFS' Request No. 3. We understand that Nick has made a determination we will not hear anything about that today. We understand that. We disagree, but we understand.

In summary, the regulations that we reviewed guide us on three key aspects of a study dispute.

First, we're here today because NMFS disagrees with the Commission's Study Plan Determination that was issued by the Office of Energy Projects on February 2nd, 2015, which found that two study requests submitted by NMFS were not required and the licensees have not been ordered by the Commission to conduct them. These were

NMFS' Request No. 3, Quantifying Existing Upper Tuolumne River Habitats For Anadromous Fish As They Pertain to Fish Passage Blockage At La Grange Dam, and NMFS' Request No. 4, that we're here to talk about today, Effects of the Project and Related Activities on the Genetic Makeup of Steelhead/Rainbow Trout Oncorhynchus mykiss in the Tuolumne River.

Accordingly, today we wish to review with the Panel the Commission's Study Plan Determination with respect to NMFS' Request No. 3, which we'll call our "Genetics Study Request" for short.

We hope that NMFS staff will provide the Panel its explanation and clarify its rationale for rejecting NMFS' Genetics Study Request.

We urge the Panel today to give equal time to questioning both FERC staff and NMFS staff and equal attention to both of the key documents at issue in this study dispute. Those are NMFS' Genetics Study Request and the Commission's Study Plan Determination that denied that request.

Second, we're here today because fish-passage license conditions are at issue in the integrated licensing process for this project. The regulations allow NMFS, as a federal agency, to dispute FERC's Study Plan Determination with respect to studies pertaining to

fish passage or fishways prescribed under the Federal Power Act.

Simply, this dispute has arisen because our agency requested study to inform potential fish-passage license conditions for the La Grange project and OEP staff subsequently determined that NMFS' Genetics Study Request is not required for that purpose. We disagree with this Commission decision and intend to discuss our disagreement today with the Panel.

Third, we're here today because the regulations pertaining to the formal study dispute resolution process -- that's in Title 18 of the Code of Federal Regulations, Section 5.14(k) -- provide for a technical conference, quote, for the purpose of clarifying the matters in dispute with reference to the Section 5.9(b) study criteria, unquote.

We understand that after this conference the Panel must deliver a finding to the Commission's OEP Director concerning the extent to which each study criteria set forth in Section 5.9(b) is met or not met and why and make recommendations.

In NMFS' Genetic Study Request we provided written responses for each of the Section 5.9(b) study criteria. Subsequently, the Commission's Study Plan Determination denied the Genetics Study Request by

reference to the Section 5.9(b) study criteria.

So again, we urge the Panel to allow time today to review both of the key documents in the study dispute with respect to their treatment of the study criteria, NMFS' Genetics Study Request, and the Commission's Study Plan Determination. In this way, the technical conference can meet its purpose of clarifying the matters in dispute with reference to the Section 5.9(b) study criteria.

With these aspects of the study dispute in mind, NMFS is here today to explain to the Panel:

First, how the project's 120-foot-high La Grange Dam has blocked fish passage for 120 years, since 1894;

How barriers to fish passage disrupt historic patterns of genetic exchange between above-barrier and below-barrier fish populations, including for Central Valley steelhead, Oncorhynchus mykiss;

How NMFS' Genetics Study Request was submitted to understand the potential adverse effects in the genetic makeup of the above-barrier and below-barrier O. mykiss populations resulting from the La Grange Dam acting as a total gene-flow barrier.

We should keep in mind that our conventional use of the terminology, quote, upper Tuolumne River and,

quote, lower Tuolumne River, unquote, is only because the La Grange Dam separates the upper and lower watershed. It is 120 feet high and has stood for 120 years.

We will explain today how the results of NMFS' requested study could inform the development of a fish-passage license condition. The results would inform whether or not the fish-passage condition is warranted and should be developed. NMFS has made no decision yet.

Second, the results would inform how or when a fish-passage condition should be developed.

We'll explain today -- and you'll recognize this as some of the other Section 5.9(b) criteria -- we'll explain how the existing information about the genetic effects is not sufficient, how the existing information is not sufficient, how the requested study would apply practices consistent with those accepted in the scientific community, how NMFS considered the level of effort and cost, how the requested study is consistent with NMFS' resource goals and objectives.

And lastly, we are reminded that NMFS' Genetics Study Request seeks to understand the effects of the project on the genetic makeup of Central Valley steelhead, a species listed as threatened under the

federal Endangered Species Act. Therefore, it is anticipated that the study results would inform future formal ESA -- Endangered Species Act -- consultation between the Commission and NMFS, including issues regarding fish passage.

Thank you.

MR. ETTEMA: Okay. Thank you.

Did anyone else have opening statement?

MR. DEVINE: The Districts do.

MR. ETTEMA: The Districts? Okay. Thank you. Go ahead.

MR. DEVINE: My name's John Devine, with HDR.

The Districts appreciate the opportunity to offer some brief opening remarks on the overall content of the technical panel's work.

The Districts believe that there are well-defined protocols and policies and underlying court precedents that help define the requirements of 18 CFR 5.9(b), which is under discussion today, and who is obligated to acquire the information needed for decision-making in the FERC process.

Because of its relevance to this Panel's deliberations, I want to read excerpts directly from a Commission order on rehearing dated July 14th, 2000, dealing with the relicensing of the Curtis Palmer

Project, FERC Project No. 2609-014.

The Commission order on rehearing deals directly with the question of what entity has the obligation of acquiring information in a FERC licensing proceeding.

The Commission order also relates directly to fishery issues and where the responsibility lies for providing information on the record before FERC to support decision-making and development of license conditions.

In this order, the federal resource agency involved was the U.S. Fish & Wildlife Service within the Department of Interior. We believe it's equally applicable to all the resource agencies. And I offer two quotes from the order on rehearing.

First, and I quote: Under the standards of the Administrative Procedures Act, a decision by the Commission to require an environmental study in a hydropower licensing proceeding must be supported by substantial evidence, end quote.

Having thus stated a basic criteria for FERC to require a study, the order then goes on to discuss who is responsible for what studies.

I again quote from the order: In addition, Interior appears to be operating -- that is, the

Department of Interior in that case -- under the assumption that the Commission is obligated to provide a record to support Interior's decision-making and that we -- that is, the Commission -- must review Interior study requests under a different standard than others.

Both of these assumptions are wrong. While we respect the Interior's statutory mission, and while, as we know from the April 27th order, we hope that licensees and other agencies can work together to ensure the necessary studies are performed. It is up to Interior to provide the records to support any fishways it prescribes.

Interior's arguments that the Commission must supply information Interior desires has already been rejected by the courts. In the Department of Interior versus FERC, DC Circuit, 1992, Interior argued that the Commission erred in declining to require studies that Interior thought vital to its development of fish and wildlife recommendations under Section -- Federal Power Act Section 10(j).

The court stated that, in that case, nothing in the statute requires FERC to conduct studies that the fish and wildlife agencies deem necessary to the Section 10(j) process. The same is true for Section 18. Still within -- this is directly from the order --

nothing in the Federal Power Act suggests that the Commission must order studies that Interior desires but which the Commission deems unnecessary to evaluate the public interest. Likewise, nothing in the Federal Power Act indicates that the Commission is required to give particular weight to study requests by Interior, end of quote.

The Commission policy, supported by the courts -- this Commission policy, supported by the courts, is directly relevant to NMFS' request that the Districts perform genetic testing of up-river, down-river O. mykiss.

FERC was meticulously clear on the scope of the information FERC needs for its La Grange decision-making process related to fish passage. And I refer you to pages B-2 and B-3 of FERC's February 2nd, 2015 Study Plan Determination.

And on page B-18 of its determination, FERC states that while the genetics information may be needed by NMFS for its own fishery management decision-making, FERC does not need the information for FERC's development of license conditions.

Therefore, if NMFS deems that it needs additional information to support its Section 18 decision-making, it is NMFS that is obligated to obtain

it.

Thank you.

MR. ETTEMA: Thank you, John.

Jim, did you have anything to open up with?

MR. HASTREITER: Yeah. I just want to thank the Panel. Jim Hastreiter with FERC. I appreciate your time. And making a wise decision on the information that's going to be presented here today and providing recommendations to the Director of OEP.

I'll just let the record speak for itself. And I appreciate, you know, as -- understanding that our letter of February 27 essentially speaks for itself.

Thank you.

MR. ETTEMA: Okay. Thank you.

So we have a list of Panel questions that I've circulated via email to the participants prior to this meeting. I believe last Wednesday I sent that out. And we're going to get to that. But I was hoping just to quickly go over some background about the project, including the degree to which the upstream Don Pedro Project sort of affects operations at La Grange.

So we've already heard that the La Grange Dam has been there for 120 years, and it's 120 feet high, but I'm interested in just sort of, you know, the basic day-to-day operations. I don't know if -- John, do you

have a quick run-through that you could -- that you could do, like how the project is operated? Or I could just ask some specific questions, too.

MR. DEVINE: Well, that might be best.

John Devine with HDR.

I think the best source of information is the preapplication document for La Grange. I'd be happy to go through some of the parts of that to describe the project. And it also describes the other project operations. So is that what you're looking for?

MR. ETTEMA: Well, I was just curious on, you know, if we could, you know, throw out some general -- some general numbers. Like, I was curious about things like reservoir depth at La Grange and Don Pedro and how deep the intake is and that kind of thing. I haven't gotten a chance -- we haven't gotten a chance to review the PAD entirely just yet, but -- I don't know if --

MR. DEVINE: I can certainly provide that information. I can't do it off the top of my head, but if you refer to the PAD in terms of depth of structures and things like that, they are provided in the PAD.

In a basic way, if you think of it, Don Pedro stores water and La Grange diverts water for irrigation and municipal and industrial use. So that's -- I mean, that's the basic project operation.

Don Pedro draws down during the irrigation season and into the fall and then fills with spring flows, and that water is subsequently discharged from Don Pedro and diverted at La Grange Dam to meet the Districts' needs.

MR. ETTEMA: Okay. And La Grange was originally -- that was built for irrigation purposes, but then hydro was later added?

MR. DEVINE: Yes. It was built in between -- La Grange was built between 1891 and 1893. Hydro was -- and the purpose of La Grange Dam was basically to raise the water level in the Tuolumne River to allow the diversion of water at the La Grange Dam by gravity means to the Districts' irrigation systems.

In 1923, the TID -- and TID -- let me -- La Grange Dam is owned jointly by the Modesto Irrigation District and the Turlock Irrigation District. Modesto Irrigation District's facilities are on the north side or right side of the river looking downstream; Turlock Irrigation District's facilities and area served are on the south side of the river or left side looking downstream.

The intake to TID's canal system is built into the reservoir at La Grange Dam on the south side of the river and MID's intake to its irrigation system is

built, of course, on the right side, at the -- right near the La Grange diversion dam, just inside the reservoir.

So TID, in 1923, added the powerhouse, which is the approximately 4 and a half- to 5-megawatt powerhouse that exists there now, fed by two penstocks that discharge from the canal where TID's water supply is delivered to the irrigation -- to its irrigation system.

MR. ETTEMA: Okay. So water first enters the canal for Turlock Irrigation District and then goes to the powerhouse?

MR. DEVINE: Yeah. So there's a tunnel in the rock at La Grange diversion dam, and that tunnel is about 600 feet long, and it -- that discharges water into a forebay area, and the forebay area contains the two penstock -- the intake to the two penstocks, and it's the headworks for the TID canal, main canal.

MR. ETTEMA: Okay. And the irrigation diversions aren't -- they're not included in the project; right, Jim? Or John?

MR. HASTREITER: So the facilities for the side of the river that feeds the powerhouse --

MR. ETTEMA: That part would be.

MR. HASTREITER: -- are included.

MR. ETTEMA: Okay. What about -- what do we

know -- I assume there's no dispute about fish passing upstream of La Grange. That is the furthest that fish can go is La Grange Dam. What do we know about downstream passage of fish? Is there any other -- is there any existing information about passage from Don Pedro down or from La Grange down? Do we have anything like that on record, either from studies for the Don Pedro Project or ongoing or other proposed studies for La Grange?

MR. DEVINE: Just a comment on the upstream passage. We have proposed and FERC has ordered or agreed to the Districts conducting a study that actually tries to measure the actual number of fish that approach the La Grange diversion dam, either steelhead or resident fish or fall-run Chinook. So while the 130-foot-high dam certainly may appear to be a blockage, the actual extent to which it is is unknown.

MR. ETTEMA: Okay.

MR. DEVINE: With respect to downstream passage, there's very little information in the record about downstream fish movement.

MR. ETTEMA: Okay.

MR. THOMPSON: Can I weigh in real quick? I think you just asked a question about is La Grange Dam a blockage to fish passage. And I think what I heard the

answer was, the actual number of fish that approach the dam is unknown, but I didn't hear an answer about whether or not the Districts feel La Grange Dam, at 120 feet high, has blocked fish passage for 120 years. Did you even get -- just a question: Did you get an answer?

MR. ETTEMA: Well, I mean, my interpretation, just from going through the record, is that -- I mean, the dam is there. As far as I can tell, there's no species migrating upstream. If that is a contentious issue that I'm getting into, then I'll just leave it at that. You know, we don't have to have that discussion.

MR. THOMPSON: I don't think it's contentious, but you didn't get the answer, but I -- I think you're correct. I think it's obvious.

MR. ETTEMA: Yeah. I'm more interested in the down- -- what we knew about the downstream passage, really.

MR. THOMPSON: And on that issue, what was the answer?

MR. ETTEMA: If there was -- I was wondering if there was any existing information, any other studies that have been done to this date, because -- and I ask that because, NMFS, in your filing you've indicated that there may be a complete blockage of downstream fish

migration, and I was just wondering if we have any -- if there's actually any evidence to support that or if there's just no --

MR. THOMPSON: No, Nick, I'm completely agreeing with your question. I didn't hear an answer of the question. But I completely agree, we did not rule it out, because we think there are likely O. mykiss living in La Grange reservoir above the dam. They could come over during spill. Water flows over the crest of the dam certain times of the year. There are several other ways that water passes. There are several conduits -- I want to say four or five ways that fish can get over La Grange -- or water can go over La Grange Dam through the powerhouse, and there's a possibility of some survival there, and there's water that spills down -- help me out, John -- I forget all the conduits -- but there are several areas.

So I think it's a good -- it's a good question, but we didn't rule it out is what I'm pointing out. I was curious to hear, is there -- is there any information about downstream passage that John or Jim know about?

MR. DEVINE: I think I answered that, but just to go back a little bit more and then I'll try it again. There was a study under the Don Pedro Project of fish

populations in La Grange pool and they found that there are two populations, the rainbow trout population, O. mykiss population, and golden population.

And we wouldn't disagree at all that under high flows there's a possibility that some of those fish of both species could flow over the dam. There are no --

MR. ETTEMA: At La Grange?

MR. DEVINE: At La Grange Dam. But there are no studies. You asked if there were studies --

MR. ETTEMA: Okay.

MR. DEVINE: -- of that, and we don't have any specific studies of that.

MR. HASTREITER: So do you understand the setup of the dam itself? It acts as a spillway.

MR. ETTEMA: Yes. Yeah, yeah, yeah. I think I've got that. But, yeah, just curious on the downstream fish passage.

Are the intakes to the diversions, are those screening for fish at all or . . .

MR. DEVINE: No.

MR. ETTEMA: No. Okay. What about at Don Pedro? Are the intakes to the turbines, are they screened or . . .

MR. DEVINE: The intakes to the -- the normal maximum water level at Don Pedro is 830 feet.

MR. ETTEMA: Oh.

MR. DEVINE: The power intake is at elevation 535 feet.

MR. ETTEMA: Okay.

MR. DEVINE: And the diversion intake, which is the old diversion tunnel, which can also act as a location to release flows, is at elevation 320.

MR. ETTEMA: Okay.

MR. DEVINE: So they're considerably below the normal maximum water surface. But again, there's no -- there's been no studies conducted, to my knowledge, of downstream passage through those facilities.

MR. ETTEMA: Okay.

MR. HASTREITER: That's my understanding as well.

MR. ETTEMA: All right. So at the end of the summer, when the reservoir's drawn down, how far -- like, how far down --

MR. DEVINE: That varies every year, depending on inflows and demands. This is the fourth year of drought, as you know, and it's very low at this point, but it can vary. Historically, over the last 40 years it's varied anywhere from -- this is from memory now -- so something like elevation 700 to 790, 780, and it can be lower.

MR. ETTEMA: Okay.

MR. CRAVEN: I had a question, Nick.

MR. ETTEMA: Richard.

MR. CRAVEN: How is actually La Grange operated? Is it sort of a run-of-the-river type project? In other words, the water comes down and you have no control over it in terms of what flow comes to the system? Your system? In other words --

MR. DEVINE: Don Pedro releases the water.

MR. CRAVEN: Yeah. But, I mean, do you ask for releases or is it just --

MR. DEVINE: The "you" being as the Districts have, during irrigation season, will identify what the release requirements are for irrigation and M&I use, municipal and industrial use. I know FERC required minimum flows of the Don Pedro Project, and those are added to the estimate -- the estimated amounts of release of irrigation and M&I water.

MR. CRAVEN: Okay.

MR. AMBROSE: Can I ask a question?

MR. ETTEMA: Sure.

MR. AMBROSE: Are there minimum flow releases downstream of La Grange to maintain certain cfs downstream?

MR. DEVINE: The minimum flow requirements of

the Don Pedro Project require flows -- the minimum flows to be measured at a point downstream of La Grange Dam.

MR. AMBROSE: Thank you.

MR. HASTREITER: USGS gauge.

MR. DEVINE: Yeah.

MR. HASTREITER: About a mile.

MR. DEVINE: About a mile downstream of La Grange diversion dam, as a measuring point for Don Pedro license minimum flow requirements.

MR. ETTEMA: Okay.

MR. WOOSTER: Nick, if I could clarify one thing on your downstream passage question?

MR. ETTEMA: Mm-hmm.

MR. WOOSTER: I'm not sure if it's clear. At Don Pedro, basically the only way fish could go downstream by entering the turbine intake a couple hundred feet below the water surface and survive going through the turbine there, that there's not a spillway or other conduit that's used that often. There's one spillway of the project that I believe was only operated in the '97 flood. So while fish could wash over La Grange, there's not that opportunity at Don Pedro. And to my knowledge, there's not been a study of any kind of survivability through the turbines.

MR. ETTEMA: Okay. I've got a couple questions

for NMFS as well, just sort of background information on O. mykiss. And certainly the Districts might have some information on this as well. But I was wondering, you know, just what the current status is of the O. mykiss population, whatever you have above and below the dams, size of the populations, hatchery and stocking practices above and below the dams, things of that nature. So do you have -- what is the current -- what do we know about the population, let's say, let's start downstream of the dam.

MR. THOMPSON: I'll start. Downstream of the dam, there are about -- there are 30 years or so of snorkeling census data that I have reviewed, and they indicate that the overall O. mykiss population downstream of La Grange Dam is low.

You could -- I will refer the Panel to the Turlock and Modesto Irrigation annual report, annual snorkeling report. I'm thinking the last year -- Steve, maybe you can help me -- I think the last year might have been reported in 2014. And this is -- so you'll see a long-term record.

In the back end of that report you'll see a couple of important figures and tables. One is a table that shows that snorkeling census data since the beginning of their technique and their method until last

year, and you'll also see a figure that indicates the distribution.

And I'll just tell you that their overall theme is that the numbers of fish are very crowded up near the dam, in the first mile or so.

There were at least seven years when there were no O. mykiss whatsoever observed in the year snorkeling, and there were other years when there were -- I would say equivalent number of years when there were probably less than ten total fish observed.

MR. ETTEMA: And do the surveys -- do they occur at a time when the -- any anadromous forms would be in the river as well?

MR. THOMPSON: Mostly those surveys occur in the spring and some were in the summer and then some were in the fall, so they vary.

MR. ETTEMA: Okay.

MR. THOMPSON: The times. Sometimes it depends on water year type. Sometimes they had flows they deemed were too high still in June to snorkel; other years, not.

So that's one thing we know is that the overall population of O. mykiss is low. If the overall population of O. mykiss is low, the anadromous population, which is a subset of the total population,

is likely to be low.

MR. ETTEMA: Okay.

MR. DEVINE: Could I comment on that?

MR. THOMPSON: Now, we know also that a -- we know that -- we know that some of those O. mykiss are anadromous O. mykiss. There was a study performed by Zimmerman, et al., published in 2009. We can provide that for you. It's in the licensing record. And some of the offspring were sacrificed, and their ear bones, their otoliths were analyzed. They did have the -- anadromy was detected in some of those fish. So we know that there are steelhead.

There's also a monitoring weir on the lower river which has the ability to detect upstream migrating adults, and they have been detected. Large O. mykiss have migrated upstream over that. We presume they're steelhead because they're over 20 inches long, very large fish, and -- but the numbers are also low. So that's the down -- that's the downstream condition.

MR. ETTEMA: Okay. Can I stop you right there?

John, you wanted to comment?

MR. DEVINE: Please. First, I would encourage you to look actually at the record and not the summary provided here.

I think I would ask Larry first, those seven

years, when were those seven years that there were zero O. mykiss?

MR. THOMPSON: I'd have to pull up the report and look. But there were --

MR. DEVINE: I think it's important to recognize that in 1996 a settlement agreement was reached among the parties about flows in the lower Tuolumne River and that the settlement agreement involved release from Don Pedro of new and higher flows downstream to the lower Tuolumne River, especially summer flows.

The summer minimum flows prior to the 1995 settlement agreement, '96 settlement agreement, which went into full -- the first full year of implementation was 1997. The prior -- prior to that, the minimum flow requirement in the summer was 3 cfs. Three.

Over the last, oh, several years, but since the settlement agreement, the over-summer flows have been considerably higher than that, as required by the new license term associated with the settlement agreement and voluntarily increased above even the minimums whereby the Districts, in conjunction with the City and County of San Francisco, to a higher flow than the minimums required by that settlement agreement.

So I think you'll find from the record, if you

look in the record -- I would encourage you to look at the record -- it's quite thorough -- that the O. mykiss population has been increasing since that '96 settlement agreement.

And the years, I think, that you'll find zero relate to years that -- well, I would encourage you to look at the record itself.

MR. ETTEMA: Okay.

MR. CRAVEN: You're suggesting the zero fish was prior to the '97 agreement?

MR. DEVINE: That's why I asked for the information. My recollection was that it -- but I don't want to yield to my recollection. I really encourage you to look at the record itself.

MR. ETTEMA: Okay.

MR. DEVINE: But the -- but since the '96 settlement agreement, the O. mykiss population in the lower Tuolumne River has increased.

MR. THOMPSON: I'd like to respond that John is correct that those zero years -- I'm looking at the report now -- I found it -- they're in dry years, you know, years like 1987, '88. But in 2000 -- I'm looking at the total number of O. mykiss -- was 31 in the lower Tuolumne River. In 2002, it was 28. In 2003, 101. So these are very low numbers.

MR. DEVINE: Is that the population estimate or is that the number of observations?

MR. THOMPSON: Number of observations.

MR. DEVINE: That's not the population estimate.

MR. ETTEMA: And we will -- you know, if we need to, we will dig out the report and just look at the report for ourselves.

MR. DEVINE: And one more question.

MR. THOMPSON: For clarification, that was -- I think I said it was 2014. I'm sorry. The report that I was able to find, the last one, excuse me, is March 2014, but I think it contains the 2013 data. And it is just entitled the "2013 Lower Tuolumne River Annual Report, 2013 Snorkel Report and Summary Update Report 2013-5."

MR. ETTEMA: Okay.

MR. THOMPSON: Thank you.

MR. ETTEMA: Thanks.

MR. DEVINE: All of those are summarized in the Don Pedro license application in terms of the estimates, snorkeling results and the population estimate.

MR. ETTEMA: Okay.

MR. DEVINE: Just one other question: How many of the fish in the weir -- the O. mykiss in the weir --

have been over 20 inches?

MR. THOMPSON: I don't know. I'm sorry.

MR. DEVINE: I would ask you to look at the record. My recollection is maybe two in the years since the weir has been in. But please look at the record.

MR. ETTEMA: Okay. Yeah. We'll look at that.

Let's move on to -- I had a question about hatchery and stocking practices. Let's just stick with below the dam for right now. Is there any stocking that occurs either by NMFS or Cal Fish and Wildlife below the dam in the Tuolumne River or the adjacent rivers? And is there -- are they a hatchery strain? Are they a wild strain that's cultivated in a hatchery? Could you explain? What does NMFS know about that at this time?

MR. THOMPSON: I think there is stocking in the drainages. I'm not really up on that, you know, in any detail. But in the lit sources that the Panel asked for there is a figure that I'll just hold up. I think it's the second-to-the-last page in the Pearse and Garza report. And it groups the different fish genetically speaking. And this is Figure 5-A in Garza and Pearse 2008. And you can see that this circle -- one of these circles shows the hatchery fish. And so, see how they group differently from this other circle, which is the above and below populations? All above and below

populations are over here (indicating). So I think --

MR. ETTEMA: That's for the Tuolumne River only?

MR. THOMPSON: This is for the entire watershed, all of the watersheds taken together.

MR. ETTEMA: Okay.

MR. THOMPSON: This is Central Valley watersheds.

But I think we can answer your question, Nick, if we did the study, if we had the study results, so we could -- we could answer the question about hatchery introgression in those downstream populations and those upstream populations.

MR. ETTEMA: Okay.

MR. THOMPSON: John wanted to --

MR. WOOSTER: Yeah. Nick, Tuolumne River itself does not have an active hatchery. There's -- a couple drainages to the north is the Mokelumne River. Above Mokelumne River there's a hatchery that raises O. mykiss. We suspect that there could be strays from that hatchery into the Tuolumne.

The drainage to the south, Merced has a hatchery, but it's a Chinook hatchery. There is a trout farm on that river as well.

MR. ETTEMA: Okay.

MR. WOOSTER: But as far as I know, they're raising fish for planting in lakes. So there's not a hatchery currently on the Tuolumne River itself.

MR. DEVINE: Can I comment on that?

MR. ETTEMA: Sure.

MR. DEVINE: CDFW does have a hatchery on the upper end of Don Pedro Reservoir. That's just below San Francisco's Moccasin facility. And they have a large hatchery there, and I believe part of that hatchery is O. mykiss that enters the plant in Don Pedro Reservoir.

MR. WOOSTER: Yes. John's right. There's a hatchery for reservoir fish.

MR. ETTEMA: Okay.

MR. WOOSTER: I was thinking about the lower river.

MR. ETTEMA: You were. We were. But I was going to come back to upper parts -- the upper part as well.

All right. One more thing before -- well, I might open it up to the other panelists, see if they have any other questions. But any other -- what are some of the threats in the downstream population and are there introduced species, predators? Are there water quality issues, problems with harvest, that kind of

thing, with O. mykiss? What are some of the more pertinent threats?

MR. WOOSTER: To the predator comment, yes. Native and nonnative predators are prevalent in the lower Tuolumne River. Water temperatures, water flows are major limiting factors for O. mykiss.

MR. THOMPSON: Yes. I would just add that the State Water Board has declared or designated the lower Tuolumne as an impaired water body. It's on the Clean Water Act 303-D list for temperature impairment. And that temperature impairment is due to the loss of the beneficial uses for anadromous fish in the lower Tuolumne. And that is a major issue. And I would agree with what John said about the -- there's a high population, it appears, of predators in the lower Tuolumne River.

MR. HOLLEY: If I could just add? In addition to the flow and temperature issues, our recovery plan also identified a couple other stressors in the lower Tuolumne, which include the loss of riparian habitat and instream cover, loss of natural river morphology and function, loss of flood plain habitat, entrainment, and predation, and potentially hatchery effects as well.

MR. ETTEMA: Okay. Thank you.

MR. DEVINE: I might add to that, if I could.

MR. ETTEMA: Sure. Real quick.

MR. DEVINE: First, we're not aware of any limiting factor analysis that has been done. There is an O. mykiss population model that has been developed as part of the Don Pedro relicensing and gone through a consultation program with relicensing participants. That does not -- I have not identified through that model that temperature is a limiting factor, or water flows. It doesn't try to identify specific limiting factors, per se. But, for example, the study done on Don Pedro, required by FERC in the Don Pedro licensing proceeding, to do with spawning habitat, has estimated the total spawning habitat and population potential of the lower Tuolumne River is over -- is in hundreds of thousands of fish. And I would refer you to that study.

So there is considerable information in the record on Don Pedro on lower Tuolumne River O. mykiss and including a population model that has been completed and filed with FERC.

MR. ETTEMA: Okay. Thank you.

We're kind of dragging on with some of that background information, so I think it's time we should jump into the main questions that the Panel circulated.

Jon, do you want to go ahead --

MR. AMBROSE: Sure.

MR. ETTEMA: -- and kick us off with this section?

MR. AMBROSE: So you'll find that the Panel came up with a series of six questions. Those questions are in back. The questions relate to the study criteria. And Question 1 and 2 relate to study criteria No. 5. Number 5 is: Explain any nexus between project operations and effects, direct, indirect, and/or cumulative, on the resource to be studied and how the study results would inform the development of license requirements.

Question No. 3 relates to Study Criteria No. 4. Number 4 says: Describe existing information concerning the subject of the study proposal and the need for additional information.

Panel Question 4 and 5 relate to Study Request No. 6. Number 6 says: Explain how any proposed study method -- it says "methodology" -- including any preferred data collection and analysis techniques or objectively quantified information and a schedule including appropriate filed seasons and the duration is consistent with generally accepted practices in the scientific community, or, as appropriate, considers relevant tribal values and knowledge.

And then our last question, No. 6, relates to

Study Criteria No. 7. Number 7 says: Describe considerations of level of effort and cost as applicable and why any proposed alternative studies would not be sufficient to meet the stated information needs.

So these will be the starting focus of the Panel's questions.

And I ask that we all speak -- we've done a good job, I think, so far. We've been respectful. We've spoken clearly. One thing I have noticed is that we're not always saying our names and where we're from, and I'm feeling for the court reporter, so if we can make sure that we do that for her benefit.

MR. ETTEMA: You want to start with the first --

MR. AMBROSE: Sure. And this one -- this is for NMFS. If you could explain the nexus or lack thereof between project operations and effect on the resources to be studied, how would the study results inform the development of license conditions? Please provide specific examples of potential license conditions.

MR. THOMPSON: Thank you, Jon.

Larry Thompson, NMFS.

This question, you are correct, is directly related to Section 5.9(b)(5) criteria.

And if I can call your attention to page 52 of our -- of NMFS' Study Request, Genetics Study Request, filed July 22nd, 2014 -- I'll give you a moment to go to that page. On page 52, and then the top of page 53, we explain in writing the nexus between the project operations and the effects on the resource to be studied, and then, secondly, how the study results would inform the development of license conditions.

So, as I said in my opening remarks, La Grange Dam is a total blockage to upstream fish passage. We discussed downstream fish passage. I think it's fair to say it does not represent a safe or effective downstream fishway.

Even if it's possible for some O. mykiss to pass downstream, NMFS would not likely consider that an effective, efficient downstream fishway.

Therefore, La Grange Dam has blocked, as I said in my opening remarks, totally blocked the gene flow between the O. mykiss population in the lower Tuolumne and that in the upper Tuolumne.

So, what we're explaining here is the nexus or connection between the project, La Grange Dam, and its blockage effects and the resource to be studied, which is O. mykiss. The federally listed species is the steelhead form of O. mykiss.

So I hope -- let me elaborate a little bit about that. We pointed out that barriers to migration and anadromy disrupt these historic patterns of genetic exchange between the two populations. What we're trying to do through the study is understand the genetic condition, understand what the consequences are of that blocked gene flow between those two populations. That's a project effect, clearly, and we want to know what the effect is.

Now, how does that -- how would the results inform license conditions? Fish passage is a license condition, would be a license condition. If NMFS decides to prescribe fish passage under our authorities under the Federal Power Act, we would contemplate mixing these two populations, passing fish that have been separated for 120 years between downstream and upstream and back and forth.

So what are the consequences of that? Well, in the lit sources that we provided you, you'll see a paper by Meek, et al., entitled "Genetic Considerations for Sourcing Steelhead Reintroduction: Investigating Possibilities for the San Joaquin River."

We cited this paper because this paper clearly identified that there are genetic considerations that are involved in putting fish from a downstream area and

mixing two populations that have not mixed for 120 years.

In this case they use the San Joaquin example. We ask the Panel to take a look at this, because there are consequences and considerations that would -- that NMFS would take into account when we put together a fish-passage license condition.

So, in other words, first of all, would we -- would we do it at all? Are there adverse consequences? We think there are adverse genetic consequences. We think we will have. We're not sure. So this study would inform that decision. First of all, just whether to do it or not. We want to be clear: We have not -- as I said in my opening remarks, we have not yet made a decision.

MR. ETTEMA: Okay.

MR. THOMPSON: And then, secondly, how or when we would do that.

MR. ETTEMA: Can I --

MR. THOMPSON: Sure. I'll stop.

MR. ETTEMA: You said one thing that interested me. You said that you think that there may be an adverse effect by putting in a fishway. Why would there be an adverse effect? Or why do you think there would be an adverse effect?

MR. THOMPSON: Well, first of all, if the downstream condition of the -- if the condition of the O. mykiss in the downstream lower Tuolumne indicates inbreeding and low genetic diversity, it may not be warranted or advisable to pass those fish into an upper population, at least initially. It may be that the population downstream needs to be improved.

John is correct that the number of what we think are steelhead -- John Devine -- is low in coming to the lower Tuolumne River. John Wooster pointed out that they could be strays.

The genetic information, the study from the genetic -- the results of the study we're asking for would indicate a lot of these things. They would tell us the condition of the steelhead in the lower river. Are they strays? Are they native? Are they inbred? Do they exhibit low diversity?

Similarly, the information in the upper population, upstream population, would indicate similar: Is the -- are they hatchery fish? Are they native Tuolumne fish? Would mixing the populations result in a better population or not? Are there steps we need to take prior to putting forward a fish-passage condition?

MR. AMBROSE: So, Larry, what I'm hearing you say -- and this isn't something that I was able to find

in NMFS' record -- is that there are potential consequences to prescribing a fishway that could have -- I think we think many times that these are -- this will have a solely beneficial effect to the fishery population, but what I'm hearing you say is that there is the potential for adverse consequences to the population either up or below and that genetic information could potentially affect whether or not NMFS prescribes a fishway or not.

MR. THOMPSON: That's correct. That's right.

And rather than just point you towards a literature source, let me be a little more specific. I would suggest that you look at page 16 of the Meek, et al., paper and look in the upper left-hand corner of that page. You'll see they use the San Joaquin as a decision-making example.

And there are five bullet items that they recommend that the genetic -- that one understand about the genetic status of steelhead before you do this. And I can read them:

You need to look at the genetic diversity and the effective population size, the levels of inbreeding, the degree of introgression from hatchery or outside -- stock outside the distinct population segment, which is the listed entity for steelhead. Are they locally

adapted from within the drainage or out toward at least from within the DPS? Is there evidence for anadromy? And do you have a census population saying its size?

So you can take a look at it and go into all the details here today, but does that -- I mean, now, you asked, Jon, about Question 1, explaining the nexus. You know, I directed you to our study request, but I want to contrast, if I could, what we provided here with the FERC Study Plan Determination. So before I close on No. 1, could we please just take a look at the February 2nd, 2015, Study Plan Determination for the La Grange project?

This is -- we'll start right at the first page. On the first page I just wanted to direct you to the very first paragraph, which it says: "This determination is based on the study criteria set forth in Section 5.9(b)." That's correct. We agree with that.

On page 2, about the middle of the page: The reasons for not adopting the proposed study plans are discussed in Appendix B.

So they're telling us, you, with respect to 5.9(b), we're going to explain the reasons for not adopting the proposed study plan.

Then, if you could turn to Appendix B,

page 18 --

MR. CRAVEN: That's on the FERC document?

MR. AMBROSE: Yes.

MR. WOOSTER: Do you want a copy, Richard?

MR. CRAVEN: No. I have it here somewhere. I've got a copy. February 2nd.

MR. THOMPSON: We're on page B-18, Richard. And if I could just read it, because it's roughly 50 or 60 words. This is the rationale given for -- FERC's rationale for not accepting the study we're talking about today. And so it lays out the issues.

The purpose of the technical conference is to clarify the issues under dispute. So that's why I'd like to read it.

"The Study Plan Determination for the Don Pedro Project, FERC No. 2299, did not require similar genetic studies of Tuolumne River O. mykiss and Chinook salmon, because, while such a research effort may be needed to make fishery management and reintroduction decisions, it will not inform the development of licensing requirements."

And then there's a citation here to Section 5.9(b)(5), which is the -- we call it the nexus criteria: "We, therefore, do not recommend that the Districts conduct this study."

So I guess I would ask the Panel, I think I explained the nexus between the project effect, the resource to be studied, and I explained how the results of the study would be used to develop a license condition. I would ask that you contrast our rationale with what was provided here and potentially have Jim --

MR. ETTEMA: Okay.

MR. THOMPSON: -- reflect on that.

MR. ETTEMA: Just really quickly, I want to say, so the licensing condition, the potential license condition that NMFS is most focused on is whether or not you will exercise your authority to prescribe a fishway and then perhaps the timing of the fishway as well. Those are the two ways in which this study could potentially influence the licensing condition of fishway prescription.

MR. THOMPSON: Well, I would say it's a bit more broad than that, Nick. But the regulations say we can only dispute. We can only be here today, as I said in my opening remarks, with respect to our mandatory conditioning authority.

So I believe that the study results will be more useful than just to inform a fish-passage condition, but that is the primary reason we are explaining here today, because the regulations restrict

us to that.

MR. ETTEMA: Okay.

MR. THOMPSON: But, you are -- it's the whether we would do a fish-passage condition, how we would do it, and when we would do it. It's really those.

MR. ETTEMA: Okay. I'm going to stop you right there.

Jim, do you want to respond?

MR. HASTREITER: Sure. Yeah. I'd be glad to.

So, you know, we're not disagreeing that La Grange blocks fish. I understand where the Districts are coming from and their argument, which was roundly discussed and leading up to the Study Plan Determination. The Districts' point is that if fish aren't moving up towards the dam, or there aren't many, there's really not a blockage. That's sort of their argument. It's based on the timing of the fish, how many fish. But it's clear dams block fish. Dams in the river block fish. So we're not disagreeing about that at all.

You know, I'm glad Larry pointed to our determination on this study. Clearly, our decision was based on that it would inform a license requirement condition. And we have a long history in dealing with genetics issues at the Commission. And, you know, I

went through a search probably in the past 20 years of when genetics studies came up, and I think there were two others in California, on the Tuolumne -- or not Tuolumne -- where is that? I'm not going to be able to find it probably. I will look for it a little bit later.

MR. ETTEMA: Okay.

MR. HASTREITER: I'm not sure where I put that citation. But there were, I think, two other projects where the Commission turned down genetics studies, again, that the Commission looks at genetics studies, principally they're a research effort, which we say here, and that essentially a research effort like that really does inform a license condition.

So, to expand on that a little bit, so the Panel understands what we mean by that, it's sort of a sequencing of NMFS' decision here, so their first decision is, they need to decide, are they going to introduce or reintroduce fish into the upper basin. That's their decision and their decision alone. Okay?

This study that they're asking on genetics is clearly related to that decision that NMFS needs to make. And I don't think they will dispute that, first of all, that's their decision and that information is necessary for them to make their decision.

The results of that sort of study, you know, Larry explained what they would use it for, but basically it's to help build a genetic database and to allow NMFS to have information on making a decision on the stock selection. Okay?

If they decide, you know, we want to introduce fish, for whatever reason, they may, under Section 18, require prescribed fish passage.

So, you know, I'm not real sure the details of their thinking, if they're just going to think, okay, the fish there in the river then will be moved upstream, or, if they're going to select another stock from a hatchery or an adjacent basin or something; but ultimately, it's clear to us that this genetics study is going to inform their decision to fish, O. mykiss, to the upper Tuolumne or not.

It could lead to a Section 18 prescription. Maybe, maybe not. We don't need that information. They need that information to make their decision on reintroduction.

So that's the basis of our argument.

MR. ETTEMA: Okay. Did the Districts -- did you have something, John?

MR. DEVINE: Well, I'd only go back to that sort of opening remarks that we made and reference the

Commission policy and the underlying court case that basically says it's up to Interior to provide the records to support any fishway it prescribes.

And FERC, in this case, in the La Grange case, have been very careful and very meticulous about identifying its responsibilities with respect to fish passage. Those, I think, are on this page B-2 and B-3 that I referenced previously in terms of downstream from La Grange, downstream of the La Grange project to upstream of the Don Pedro Project.

And I agree with Jim that Larry has -- and Larry has introduced many questions that need to be answered. We completely understand and agree with that. And he's done a great job of identifying the questions, and they're important questions to answer. But NMFS needs to answer those, not FERC or not the Districts.

And that falls into those responsibilities and obligations of Interior or converse here to provide the records that support any fishway it prescribes.

MR. THOMPSON: I'd like to respond.

MR. ETTEMA: Okay. Real quick.

MR. THOMPSON: Real briefly, we're asking for this information in a Federal Power Act proceeding.

When Jim said this is our decision and our decision alone, I'm really not understanding that. It

is true that we have the authority, it is our sole authority under Section 18 of the Federal Power Act, but it's a Federal Power Act proceeding, so we're asking for that information to inform a decision.

We would think FERC would want to see that. This is a project they're going to license. And this is a project that affects the federally listed species.

The Endangered Species Act says that FERC, federal agencies, in Section 7, are to take actions to promote the recovery of a species. So it's not simply NMFS' -- it's not they don't need it, we need it, it's ours.

Let me draw -- let me also say, this information would inform other participants in the licensing proceeding. There are other participants who have mandatory conditioning authority such as the California State Water Board. The State Water Board might decide they want to take some measure to protect the species, enhance it, somehow pass fish or take some actions that have to do with the genetics of these fish.

Let me draw one more analogy. If we have a federal agency that has a reservation that overlaps with a project area such as in this case, the BLM, just use them as an example, they have mandatory conditioning authority under Section 4(e) of the Federal Power Act;

correct? Everybody knows that. When they ask for studies, FERC doesn't say, well, that's your problem, BLM. That's your decision. You go out and get that information. Or Forest Service, you go out and get that information for your 4(e) authority. That's your decision.

FERC almost -- almost always says yes, this temperature model is needed, this flow model, we need hydrology information about the flow effects of the project, the gravel effects of the project, et cetera.

What's the difference? In this case NMFS is asking for information in the Federal Power Act to inform our Federal Power Act licensing authority. It's that simple.

MR. WOOSTER: Nick, I need to clarify one thing that Jim said. He said that this information, genetic information, was for our stock selection and that alone. It's not. It goes far beyond that. This information is needed to know before we can make the decision of whether to reintroduce fish above, below the dam. It's at the core of the decision here. It's not just for picking which fish do we want to put upstream or downstream if we were to go ahead and prescribe.

Secondly, the view that genetic information is only research information is really not keeping up with

the times. At this point genetic sampling is being done on projects throughout California, throughout the Northwest, as a monitoring tool. It's -- the genetic field of fish has exponentially grown in the last decade.

And if you look at projects on the American River, the Feather River, the Sacramento River, it's a way that people are actually quantifying what fish are returning, and monitoring them through time. It's not purely a research effort. It's at this point akin to escapement monitoring, a screw trap in a way.

And to summarize, for me the nexus here, you could just look at basically how you kind of organized your questions to us. You wanted to know about what was going on with the lower river fish and what was going on with the upper river fish. They were distinct, separate questions. That alone is a project fish -- or project effect.

If you took out La Grange Dam, you'd have one continuous population and you wouldn't be segmenting your questions into upstream fish, lower river fish. It's the entire state of how O. mykiss are evolving in the Tuolumne now is a project effect. The limiting of the anadromous fish and gene flow to the upper river is a project effect that we know it's affected the

populations.

MR. ETTEMA: Okay. And I just want to touch on one thing that Larry said. He said the information might inform other participants, but you've also indicated in the letter that this might inform, you know, 10(a) recommendations, or 10(j)s. Would it inform any other recommendations for NMFS other than the Section 18, the prescription --

(Brief telephone interruption.)

MR. THOMPSON: The answer to the question is yes. I mean, I want it to be clear that we understand we can only dispute with respect to our Section 18 authority. But certainly, if we decided not to pass fish upstream but just enhance the lower river population, we might submit a 10(a) or 10(j) recommendation to say improve flows or improve temperature or habitat for the O. mykiss downstream.

In addition, you know -- again, we can only talk about the 5.9(b) criteria here -- but 5.9(a) asks us to submit information to be used in future Section 7 consultation with the Commission.

So I'm just going to link to that by saying -- I emphasized it starting in my opening remarks -- this is a federally listed species we're talking about. So whether it is, in the Federal Power Act world, it's

Section 10(a), Section 10(j), and our Section 18 fish-passage conditions, but it's pretty likely -- it's almost a certainty that this project will undergo future formal Section 7 consultation. And whatever we decide, including what FERC decides, its proposed action will undergo that consultation, including our fishway prescription. It will have to be reviewed to make sure that it promotes recovery and doesn't do harm.

MR. DEVINE: This is John Devine, HDR.

Just to mention that ESA is not a mandatory condition authority, and I don't know that it really has a bearing or should have a bearing on this technical panel and their decision, because it's not a mandatory conditioning authority and therefore shouldn't be under discussion.

MR. WOOSTER: Nick asked about 10(a) and 10(j).

MR. ETTEMA: Just because it's part of the letter there. Yeah. Well, I was just curious as to how you thought the result of the genetic study might result in some license condition about flows. Would you look at the genetic makeup and say, oh, well, because it's this strain, we would come up with a license prescription or a license condition that would adjust flows to improve habitat for a certain genetic strain or something like that.

I was trying to understand, because you mentioned, you know, 10(j)s and 10(a)s in the letter, and I was just trying to understand that a little bit better.

MR. THOMPSON: That's a really good question. But I wouldn't look at it just as is it a genetic strain that we're trying to promote.

John talked about how the genetics -- the world of genetics has really changed in the past decade or more, and it's now becoming clear that we all know that it's expensive and difficult to track fish in a river, especially little guys. You tag them over many years to figure out how many of them are there, where are they moving, holding, and such.

And some of these genetic techniques that we are asking to do is -- involve what's called a parentage analysis. And what we're learning is that when populations are low or difficult to sample, you can learn a lot about the size of the population by looking at the genetics, for example.

You can look at the diversity. You can -- you can essentially build a genealogy so that if you sample an adult fish at the upstream migrating weir and you do genetic analysis of it, that -- that's a parent. Say it's a female steelhead coming in. You can sample the

offspring, the little guys, and do a similar genetic analysis, and you can map the offspring to the parent. And you can do this over subsequent generations, so you get like a family tree, a genealogy over many years.

If you were trying to just tag the fish with markers, you know, little pit tags, it would be very difficult to do that kind of thing. Maybe impossible.

But what -- so to get at your question, Nick, the downstream alone genetic information could be used to indicate the health of that population without really doing -- you know, it would be information that would add to things like snorkeling and population estimates. And then we might -- we might say, listen, this population isn't doing well. We know more about it.

We might find out, as John said earlier, this population is made up of hatchery strain. We might find out it's made up of fish that washed down over La Grange Dam and repopulated. We don't know.

MR. ETTEMA: Okay.

MR. THOMPSON: We need the study.

MR. ETTEMA: I feel we've hit on No. 1 and No. 2 as well. I had one specific question related to Question No. 2, and that is: Under what conditions would NMFS not prescribe a fishway?

Is that really -- because it seems to me that

the options would be NMFS would prescribe the fishway or they would choose to include that standard re-opener sort of -- is there a condition where you would actually not choose to prescribe a fishway at all? There would be nothing, no re-opener. Or is it really just one or the other? Is it -- would you put the re-opener? Would you ask for the re-opener or would you just prescribe the fishway?

MR. THOMPSON: Do you want to take it?

MR. HASTREITER: Can I answer from my experience? I've never seen --

MR. ETTEMA: Sure, Jim.

MR. HASTREITER: -- NMFS not reserve their option. So if they don't prescribe a fishway, they typically reserve their option to prescribe --

MR. ETTEMA: Right.

MR. HASTREITER: -- in the future.

MR. EDMONDSON: I think that's what I was -- I was trying to go back to my model.

MR. HASTREITER: They look perplexed, so I was just --

MR. ETTEMA: I'm wondering, if you did this genetic study, would you look at it and say, oh, well, nope, no fishway at the Tuolumne River, you know, based on that one study or --

MR. WOOSTER: Yes, you could discover certain traits, genetics, in the upper watershed that would deem it a no-go. That's more or less the feedback we're getting from our Science Center, that you need to quantify what is downstream, what is upstream, before you can start looking at the effects of inbreeding and outbreeding and what impacts you have on the population. Exactly what you would need to find up there to quanti- -- to make it a no-go, I'd have to pull in the Science Center to answer that aspect. But they have advised us that you need to fully understand your populations upstream, the project's impacts on those populations by not allowing the gene flow from anadromous fish into those isolated barrier populations.

So yeah, I think you're kind of driving at could this genetic study, in and of itself, determine a yes or no on the Section 18 at this time. I think the answer is yes.

MR. EDMONDSON: Yeah. And I think -- I'm trying to think back. We have engaged in relicensing proceedings and not filed under 18 one way or the other. In some of those cases where, instead, we were more interested, for instance, coordinating flow releases for the benefit of fish downstream, not necessarily looking at the opportunities to pass.

And I'm thinking when we were involved in the San Joaquin and some of the upper San Joaquin projects, Big Creek, Vermillion, those facilities, we were looking at opportunities to coordinate releases, looking for opportunities to coordinate releases with eventual restoration in the lower San Joaquin.

So there are times when we don't necessarily prescribe under 18. There are various impacts and opportunities for recovery that don't involve fish passage alone.

And I'm sorry. This is Steve Edmondson with NMFS.

MR. ETTEMA: Okay.

MR. DEVINE: Comments or questions from John Devine, HDR.

One of the questions that we -- that arose in our comment letter had to do with -- has the question of the need for the information but answer. There was a long description about in the -- in that section of the NMFS response in terms of the state of the art of genetic testing and that source of information, which was very informative, but it wasn't clear that the question was answered in terms of, well, what's actually the need for the information; and that is, how this specific information can be used to either prescribe a

fishway, not prescribe a fishway or reserve authority. And what John is saying is that that's -- that is a possibility and that the information could lead to not prescribing a fishway, but that needs further explanation from the Science Center or other parts.

We'd like to ask for that information. We'd like to know how that is made. That would answer the question. I think that's important for the Panel to know -- to answer that Criteria No. 4. What's the need? Explain the need for the information; that is, how will this information be used to make decisions.

And we find what we're hearing today is it will be and it could be used to decide, it would not be a prescription, but others have to comment on that. And we think it's important to hear and the Panel to hear how will that information be used in that regard. And more than just it will be, we're not sure how, because others have to answer that. I think the Panel should request that information in order to address that comment and address that criteria.

MR. EDMONDSON: This is Steve Edmondson again.

John, that's a -- that's a good question, but it's depending on the results.

MR. DEVINE: Right.

MR. EDMONDSON: So we can't say what are we

going to do with the information unless we know what the information is. And I think Larry gave some examples, and we can give further examples of where genetic information is no longer used as a research tool besides it's advanced to the point that it's being used as a realtime decision-making tool. He gave some examples that are examples other than the Central Valley I can't think of -- and I'm looking at Rhonda -- of other reintroductions in the Central Valley where we're not using genetic information as a decision-making tool.

MR. DEVINE: But in this one you are.

MR. EDMONDSON: I can't think of one where we're not using it as a decision-making tool. And that's -- again, that's the advance of the science to the point where it's used as a realtime decision-making tool. And there are abundant examples of that. So how we would use the information depends on exactly what that information says. We can't predetermine what it says. But we know what the questions are, and the similar questions are being asked elsewhere in the Valley in thinking about reintroductions.

And another example -- I'm sorry, Jim -- was Potter Valley. We engaged in the Potter Valley relicensing and did not prescribe under 18.

MR. THOMPSON: I want to be clear that if

the -- if the Panel agrees with what John Devine says, that we have not explained to you adequately how we would use this information to inform our fish passage conditions, then you need to ask us, because I want to provide that to you.

Steve is correct. I provided examples. Let me give you an example, not having the study done. But if the immigrating adult steelhead coming into the Tuolumne are hatchery strays, for example, from the Mokelumne hatchery, it is not likely we would put forward a fish-passage condition and pass those fish upstream without more study and more action.

John went over inbreeding depression and outbreeding depression. If mixing these two populations creates a worse condition than we have now, we would not prescribe a fish-passage condition until we took some other steps. And so I can't be more clear than that.

Would we just reserve, we might -- we might reserve, we might implement a prescription that occurs later in time. So we said this would -- this would inform whether we do it and when we would do it and also how we would do it.

MR. ETTEMA: Okay. And just to finish up these two, I had one last question related to this, and what were the -- what are some other studies or information

that would inform a fishway prescription? Is there any other -- are there some approved studies for this project specifically or some studies from the Don Pedro Project that will also be used to inform a fishway prescription?

MR. WOOSTER: Number 3? Is that -- are you looking at Question 3?

MR. ETTEMA: No, no. I have just a couple other questions related.

MR. THOMPSON: Well, let me start off, John. Earlier I wanted to bring this up. I think, Nick, you asked us, would this study alone be a yes or no.

MR. ETTEMA: Right.

MR. THOMPSON: And John correctly answered that as this study alone could be a yes or no. But I wanted to bring forward that we cannot discuss Study Request No. 3 today. It's been determined we shouldn't. But that discusses the habitat upstream, so that is another study that we would -- if we had it done, we would use the results to inform the potential fish-passage condition. Would we pass fish from downstream to upstream if the habitat up there were not good habitat? Probably not. So there are other studies.

And John is also -- Wooster -- I wanted -- I mean, we put together the fish-passage request, so we

certainly have other study requests forward that have been either approved or partially approved that also bear on -- you know, we have to know if it's feasible and how we would pass the fish upstream and downstream, the techniques themselves.

MR. ETTEMA: Right. And I thought I saw a feasibility study perhaps that is approved or in agreement between . . .

MR. DEVINE: The Districts proposed in its revised study plan a fish-passage assessment, a portion of which is a study of fish-passage options upstream and downstream at La Grange/Don Pedro, and FERC approved that study, and we intend, in collaboration with NMFS, to conduct that study.

MR. ETTEMA: Okay. Other questions from the Panel on Question 1 and 2? All right. I think we --

MR. AMBROSE: I just -- in terms of fish passage, we had talked very early on about recovery and recovery plan. What role does the Tuolumne River play in recovery of steelhead? How important is the Tuolumne River for -- can you answer that?

MR. HOLLEY: This is Tom Holley. I can try and take a shot at answering that.

Our latest recovery plan identifies the Tuolumne, upper Tuolumne, above Don Pedro Reservoir, as

a candidate watershed for potential reintroduction of O. mykiss.

One of the actions, one of the recovery actions is to investigate the potential of a reintroduction of O. mykiss to the upper Tuolumne, so that means undertaking its habitat studies, conceptual fish-passage studies and, you know, some genetics studies like we're talking about today.

So it is important to look at the watershed or population currently in the Tuolumne. And, you know, that's what the recovery plan calls for, investigating fish passage into the upper Tuolumne.

MR. AMBROSE: Okay. And I had one other question.

Jim, you made mention early on in regard to genetics studies and FERC not having a history of moving forward with those. Is that because FERC is worried about setting a precedent or is that because the latest -- or is there some other reason for that? Because in this -- on page B-18 it cites the Don Pedro Project, and as I understand it, NMFS didn't necessarily have jurisdiction over that project because La Grange is downstream. Is that necessarily an appropriate rationale for deciding not to move forward with a genetics study on La Grange?

MR. HASTREITER: I'm sorry. Is what the appropriate rationale?

MR. AMBROSE: You cited the Don Pedro Project --

MR. HASTREITER: Okay. I gotcha.

MR. AMBROSE: -- and the fact that you didn't require a genetic study there. And it seems to say, by reference, because we didn't require it on Don Pedro, therefore, we aren't going to require it on La Grange. But these seem to be two different projects. These are two different projects. And at La Grange we have anadromous fish downstream. And what NMFS, as I understand it, is asking for is genetics studies on steelhead downstream and O. mykiss upstream. And I'm confused as to why the genetics study was denied for La Grange by citing Don Pedro.

MR. HASTREITER: Well, it's a similar study. It's a genetics study that Fish and Wildlife asked for. Okay? And the rationale was identical, that essentially it would inform a license condition by conducting that study. It's just -- it's the same rationale.

MR. WOOSTER: The Fish and Wildlife study requested almost no parallels to our study request. They asked for a study of a hatchery Chinook plant in the Don Pedro Reservoir. We're asking for a study of a

totally different species upstream and downstream of the project. They specifically wanted to know about the Chinook and Don Pedro. I fail to see the parallel between -- Jim just said it was a -- I don't know if he said identical or similar request to Fish & Wildlife Service request to the one we're disputing today. I fail to see the parallel, given that that was a study of hatchery Chinook in Don Pedro Reservoir, and we're asking for an evaluation of O. mykiss, a population that has been fragmented and segmented by this project.

MR. HASTREITER: No, I see the difference. But still, in this study NMFS needs to make a decision on reintroduction. And this study that Fish & Wildlife Service asked for, that wasn't necessary. So that's the difference.

MR. WOOSTER: Okay.

MR. HASTREITER: So the Fish and Wildlife Service isn't going to make a decision on reintroduction; National Marine Fisheries Service is.

MR. WOOSTER: Yeah. So how does denying their study, when they weren't making a reintroduction, have any bearing on what we're talking about today?

MR. HASTREITER: It's still a genetics study -- just wait. Let me finish. It's a genetics study, and it's not going to inform the license condition. Their

study wasn't going to inform a license condition. Your study isn't going to inform a license condition. It's going to inform your decision whether to reintroduce fish to the upper basin.

MR. THOMPSON: Fish-passage license condition.

MR. HASTREITER: And those are your words, Larry. And that's fine.

Our perspective is that NMFS needs to make a decision on passing fish to reintroduce them to the upper basin.

You know, I've explained it. It's very simple, very straightforward.

MR. WOOSTER: The Section 18 prescription is a license condition.

MR. HASTREITER: It is.

MR. WOOSTER: Okay.

MR. ETTEMA: Okay.

MR. CRAVEN: Let me take one more shot at this.

Why wouldn't that be -- lead to a license condition?

MR. HASTREITER: I'm not saying it wouldn't lead to a license condition. Okay? What I'm saying is they want this genetic information to make that decision whether they're going to put fish up there. Okay?

They've already explained, depending on what

that information shows, they then will decide whether yes, we're going to submit a Section 18 prescription or we're not going to, or some other combination of that.

So yes, it could lead to that, but the first decision is NMFS needs to decide whether they're going to introduce or reintroduce fish to the upper basin, and that's the purpose for that genetics study.

MR. CRAVEN: But don't they need the results of the study to determine whether they will or won't?

MR. HASTREITER: And they do. I agree. We don't. That's the basis of the argument here. And John has already cited Commission precedent, and there's been other cases.

MR. THOMPSON: But Richard, your question is a really good question. And in the opening remarks NMFS said we are going to stick to the Section 5.9(b) study criteria. So if we could go back and look at Section 5.9(b)(5): We must explain how the study results would inform the development of license requirements. Wouldn't they inform the development of license requirements, Jim, the genetic result?

MR. HASTREITER: No.

MR. EDMONDSON: But for the same reason --

MR. THOMPSON: Well, then --

MR. EDMONDSON: This is Steve Edmondson.

If they would inform NMFS' determination under 18, then why wouldn't they also inform FERC's determination under the balancing provisions of the Federal Power Act under 10(a) and 4(e)?

FERC also prescribes and creates terms and conditions and licenses. It's not just NMFS. And if it would apply and if we agree that it makes sense for NMFS, then it would make sense for the Commission. The Commission, under Federal Power 4(e) must evaluate licensing issues, must give equal consideration.

And, you know, again, if it makes sense that NMFS would use it for that, then it would make sense that FERC would. FERC can also prescribe or also determine conditional license to include fish passage.

MR. HASTREITER: I think in a case like this -- you know, Hell's Canyon is a good example -- the Commission is not going to take the lead in making decisions on reintroduction of fish above projects. And we see that as NMFS's responsibility. And any information associated with that sort of decision is NMFS' responsibility.

MR. EDMONDSON: Has FERC ever required fish passage in a license, independent, outside of Section 18?

MR. HASTREITER: You know, I don't know. Not

in any cases I've worked on.

MR. EDMONDSON: Okay. I would say that FERC has, and FERC has a responsibility under the Federal Power Act and the balancing provisions under 10(a) to consider and include provisions that balance --

MR. HASTREITER: We ultimately will get involved in that. But NMFS has the lead on making the decision on reintroduction.

MR. ETTEMA: All right. We're going to take one last comment from John here and then we're going to take a break.

MR. DEVINE: This is John Devine, HDR.

I think the question here is not the need for the information, it's who is obligated to get the information. And this was the purpose of the opening remarks we made where FERC policy, backed up by court decisions, have said that it is up to the resource agency, Interior Commerce, Fish & Wildlife Service, or NMFS, to provide the record to support any fishways it prescribes. It's as simple and it's as clear as you can be.

Now, if FERC had decided that it needed that information to decide on a fishway, if fishways were appropriate for La Grange and Don Pedro, it would have asked for and decided that that information on genetics

was necessary for its decision. FERC has decided it is not.

What FERC has decided in their Study Plan Determination is that the fish-passage assessment that the Districts proposed, which is a complete assessment of fish passage upstream and downstream, is adequate for FERC's purposes of estimating the feasibility or establishing the feasibility or not of fish passage.

So it will make a decision on the record, we assume, balancing power and nonpower resources, by using the fish-passage assessment that the Districts have proposed and FERC has directed the Districts to do.

So FERC, absent information on fish passage -- it will have plenty of information on fish passage -- FERC does not make decisions, at least to my knowledge, on reintroductions, how to colonize upstream habitat, what strain to use, what's the selection of the source.

These are decisions, as NMFS has gone to great lengths to point out here, that NMFS will have to make. I don't think they would want FERC to make those decisions. And they aren't left to FERC to make. They're for NMFS to make.

And it goes back to the original comments I made in the opening remarks. Again, the policies and procedures, the court precedents are clear: It is up to

the resource agency to develop the information it requires to support its fishway prescriptions.

MR. ETTEMA: Okay. Thanks, John.

And with that, we're going to take a break. The time is 11:00 right now. We're a little bit behind on the break. But is 15 minutes okay or can we do it in less? Can we do it in ten? Okay. Let's take a 15-minute break.

(Recess taken, 11:00 to 11:19 a.m.)

MR. ETTEMA: We will reconvene the meeting.

We left off No. 3. So No. 3 is: Why is existing genetic information for O. mykiss inadequate to describe the genetic makeup of populations or assess potential project effects?

And then: Are there any other ongoing or proposed studies that would contribute additional information on O. mykiss genetics, population structure, or gene flow?

NMFS, do you want to go first?

MR. WOOSTER: Sure.

Kathryn, are you back on? Can you hear us?

MS. KEMPTON: I am. Thank you.

MR. WOOSTER: Okay. Existing information is inadequate. Really, simply, one, due to a lack of samples and really an extreme advancement in the

technology that's available now to look at genetic samples.

There's been a lot of quotes back to Nielsen 2005 and Garza and Pearse or Pearse and Garza -- I think Garza and Pearse -- for example, Nielsen, et al., was looking at, I believe, 11 loci markers; Garza and Pearse in 2008 were looking at 18. And Garza and Pearse -- they're part of our Science Center lab -- their latest work, I believe, is looking at 105 markers, and it's not only the -- they've expanded the number of markers, they've identified and isolated a lot more that are highly variable between populations, so that, you know, by a factor of 10 they've increased how many markers they're looking at and they've also identified more responsive ones. Add that to the algorithms that they've developed to be able to process populations, the population structure, it's leagues beyond what was available 10, 15 years ago.

Samplewise, we're -- conversations with our Science Center, we believe they have one sample from the upper watershed and one sample from the lower watershed. And by sample -- because there's multiple pieces of tissue, but it's one geographic and temporal spot in time that they're looking at, so -- and there is the potential, I think, to use those -- each sample that

they do have in any analyses going forward.

But when we approached the Science Center to talk to them about this study and their availability, they were extremely receptive, basically because they felt like they knew close to nothing about Tuolumne River genetics, which is a key piece to understanding the Central Valley.

The previous studies were not Tuolumne-specific or Tuolumne-focused. They were basically broad-brushed Central Valley-wide analyses of O. mykiss genetics. So that's basically why the existing information is inadequate for the study, the needs here, within this relicensing process.

What other ongoing or proposed studies, right now, on the American River, the Bureau of Reclamation is doing a very similar study for O. mykiss that we proposed here for the Tuolumne. That's part of a potential reintroduction effort on the American River.

That study, in and of itself, I think, could contribute valuable kind of lessons learned to the study that's proposed here. I think there's lessons to learn to see what happens to O. mykiss genetics when you segment a population with a dam. But again, it's -- none of that study is Tuolumne-specific, so it's not going to fill the void that we have in this project.

MR. HASTREITER: Is that in the San Joaquin?

MR. WOOSTER: It's -- no. It's technically Sacramento.

MR. HASTREITER: Oh, okay.

MR. WOOSTER: It comes in right about where the Sacramento and San Joaquin rivers meet.

MR. HASTREITER: Okay.

MR. WOOSTER: You can step out and see the mouth almost from this building.

MR. HASTREITER: Okay. I was just wondering where it basically was.

MR. WOOSTER: Other existing studies. NMFS, as of last week, we obtained -- were awarded some funding to do genetic work on the Tuolumne. We're estimating that we have about a third of what the cost of this study could be available to us, so we're hoping, either through your determination, FERC's orders, the Districts' willingness to partner, with the funding that we have available, to complete the study.

MR. DEVINE: How much funding do you have, John?

MR. WOOSTER: We have about 50,000 for lab work, and we're -- I don't want to say that this work has to be done by NMFS' Science Center, but if you're interested in any level of efficiency, you would run the

work through the Science Center. They're the ones that have the database, the algorithms, all the research that it takes to really do a genetics evaluation. Now you can actually move into the applied side very easily with what they have developed. We are working on additional money for fieldwork and sample collection.

MR. DEVINE: Thank you.

MR. THOMPSON: Can I add something just real briefly?

What John talked about, with the American River study, I mean, it's Bureau of Reclamation-funded, because it's their dam. They manage it. It divides the lower American and upper American, so there's a parallel there. We might be able to get you a copy of it, send it to the Panel. I think it would be real informative.

The study was ordered under the Endangered Species Act biological opinion. It was part of the feasibility study for fish passage, should we pass fish. And so one of the first studies they did was determined should we pass the lower American steelhead to the upper American. And so they did a genetics study of both the lower American and upper American. I think John described that, but I just had a little more detail.

MR. WOOSTER: And it actually preceded any kind of fish-passage evaluation and design. That was

basically their first step was to do a genetics evaluation on the American River.

MR. ETTEMA: Okay. Any other comments on existing information or potential other sources of existing information or . . .

MR. DEVINE: I would ask, John, I wasn't sure, were you referencing the two studies that have been done on O. mykiss populations on the Tuolumne?

MR. WOOSTER: They were Central Valley-wide studies that had a sample from the Tuolumne.

MR. DEVINE: And so the thought is those samples were too small to be representative or --

MR. WOOSTER: The one spot -- to go -- the one geographic spot and one temporal spot, one temporal slice. We understand the upper Tuolumne sample is from Cherry Creek is our understanding.

And these samples also, I believe some of them are kind of collected ad hoc, that various folks had gathered and brought in, weren't necessarily part of a design study plan, kind of just whatever information you can -- whatever samples are available to you kind of approach.

So, for example, in the upper Tuolumne, if you have one sample from Cherry Creek, you don't have anything on Eleanor Creek, south forth Tuolumne, middle

fork Tuolumne, Clavey River, north fork Tuolumne, mainstem Tuolumne, mainstem Tuolumne, say, above Early Intake or below Preston Falls, the historic barrier to anadromy. There's a large suite of areas that should be sampled. So we weren't able to really locate much information about the one lower river Tuolumne sample.

MR. DEVINE: Okay.

MR. WOOSTER: And I don't know much about Nielsen's work. That was the 2005 paper. But also, I understand it was a very limited sample. But I was told.

MR. DEVINE: Are those samples still available to your lab?

MR. WOOSTER: I believe the stuff that fed the 2008 paper are, the one lower and the one upper. That's my understanding, that you'd have two samples to jump-start the study.

MR. DEVINE: Has the Science Center given you any ideas of what sample size they were looking for?

MR. WOOSTER: They were approximately looking for 25 to 50 tissue samples per geographic location we'd like to characterize. That allows you to do what they call a population-level analysis as opposed to just an individual-fish analysis. So if you want to take that range and extrapolate the -- how many areas you're

looking for, you can have a rough estimate on the number of samples.

MR. DEVINE: Thank you.

MR. ETTEMA: Okay. I think we're starting to actually touch on the next question.

I wanted to point out one thing. There was one other study that the Districts had cited. I believe it was in the RFP. It was Lindley, et al., 2007. And can we ask that that be submitted for the record?

MR. DEVINE: Yes.

MR. WOOSTER: We have it.

MR. ETTEMA: You have it as well, but you didn't cite it, but I thought I'd ask for it.

MR. WOOSTER: I believe that you're citing the study that talks about the historic extent of O. mykiss population. It's not a genetics study.

MR. DEVINE: Right.

MR. ETTEMA: Okay.

MR. THOMPSON: I'm not sure, but my knowledge, that paper is 2006. But we could -- why don't we give him both. One is about salmon and steelhead, and I believe the 2006 paper is just about steelhead, talks about the historic --

MR. ETTEMA: Whatever's cited in the record.

MR. THOMPSON: Okay.

MR. ETTEMA: And then any other sources of information. We have the Central Valley, I think it's the recovery plan is already submitted on the record, but is there any other sort of review, like I was thinking for steelhead, is there a five-year review? Is there a recent five-year review that would have information that's pertinent to genetics?

MR. THOMPSON: Yes.

MR. WOOSTER: What year was that last?

MS. REED: The most recent one -- this is Rhonda Reed. The most recent five-year status review was completed in 2011, and so it's been five years. We're working on the next one now, and, you know, it's in progress.

MR. WOOSTER: Okay.

MR. THOMPSON: I have that document on my computer.

MR. ETTEMA: Okay. Perfect. Thank you.

MR. DEVINE: The only other thing I could mention is that the reference project on the American River is not a FERC-licensed project, so different rules, protocols, and policies, of course, apply.

MR. ETTEMA: Right. Any other questions from the other panelists on No. 3?

MR. AMBROSE: No.

MR. ETTEMA: I think we're kind of already starting to get into that No. 4. So what specific method is recommended to determine effects of the project on the genetic composition of O. mykiss in the Tuolumne River above and below the project?

MR. WOOSTER: I mean, basically what I was referring to, what's available now, you take a tissue sample, it's generally a very small fin clip, and we're recommending that you really evaluate all the potential genetic variation within the upper watershed, so within the mainstem, the main tributaries, and above and below any known natural barriers on those tributaries. I'd estimate it as somewhere between 12 and 14 unique geographic sites in the upper watershed.

MR. ETTEMA: With how many samples per site?

MR. WOOSTER: Twenty-five to 50.

MR. ETTEMA: Okay. Twelve to 14 locations in the upper watershed, based on, you said, natural barriers?

MR. WOOSTER: Well, some of it's based on -- there's one of the Lindley papers that shows the historic extent in the tributaries and upper watershed, and so you would look in those tributaries, you would attempt to look above and below any known natural barriers within those tribs, multiple samples within the

mainstem, and that -- although it's not a project facility, there's other dams in the upper watershed. The City and County of San Francisco has multiple dams, one of which is -- well, two of which are on the mainstem, but the most downstream one is called Early Intake Dam. Upstream of that is what's known to be the -- presumed to be the historic extent of the anadromous fish on the mainstem. It's called Preston Falls. So we would recommend --

MR. ETTEMA: And that's downstream of Early Intake?

MR. WOOSTER: That's upstream of Early Intake, downstream of Hetch Hetchy.

MR. DEVINE: So just as clarification, is the study that's -- that was proposed to extend above Early Intake, as it was proposed by NMFS?

MR. WOOSTER: We did not develop a sampling map for that study or we hope -- we'd like to develop that in consultation. But yes, it would likely be beneficial to take a sample above Preston Falls, what's known as the historic extent of anadromy. That would help you characterize what the genetics look like of fish that were historically influenced by the anadromous fish returning.

MR. DEVINE: Is that related to a project

effect?

MR. WOOSTER: The fish that are affected by the project are -- would be everything downstream of natural barriers, those that have had their anadromous gene removed by the project.

To properly understand your effect on those fish, it would be beneficial to get genetic samples of fish above the natural barriers.

MR. DEVINE: So the project effects extend above Early Intake and above other dams?

MR. WOOSTER: No. The project effects would extend up to those -- the project effects would extend up to any fish that's below -- downstream of -- between Don Pedro and any barrier upstream.

MR. HASTREITER: So Preston Falls.

MR. WOOSTER: Preston Falls. But Preston Falls is about a mile or two upstream of Early Intake.

MR. DEVINE: So Early Intake.

MR. WOOSTER: For the population affected by the project?

MR. DEVINE: Yeah. The project effect.

MR. WOOSTER: Yeah.

MR. ETTEMA: Are there rainbow trout O. mykiss above Early Intake and above -- is it O'Shaughnessy Dam at Hetch Hetchy? Are there populations there that are

native or planted? Or do we know that information?

MR. WOOSTER: There are O. mykiss populations there. The native planted question is part of what this genetics study would help inform. That would be true of pretty much any population you take a sample from, you would ascertain whether they are native or influenced by a hatchery.

MR. ETTEMA: Mm-hmm. So you mentioned the other -- the study at the Bureau of Reclamation dam on the American River. Is that -- I'm trying to get a better hold on the proposed methodology. Would you -- are you saying that this study would be -- would you use the methods from that study for this study? Would it be sort of a mirror study or a complementary study or would it be . . .

MR. WOOSTER: I wouldn't call it complementary --

MR. ETTEMA: Okay.

MR. WOOSTER: -- but a mirror, possibly.

MR. ETTEMA: Mirror.

MR. WOOSTER: At least as far as the genetic and the method that you would collect the samples, the lab analysis that we would do would be -- we, assuming the Science Center -- would, as far as I understand, be nearly identical. I think the general approach to where

you would geographically locate the samples that they used in that upper watershed would be similar, so I think there would be a lot of parallels between how they conducted their research and what we would do here.

MR. ETTEMA: Okay.

MR. THOMPSON: Can I just add to that? The database that our lab has put together is now statewide. So they would have the ability, if we did Tuolumne River study, to compare the genotype of all those fish with all of the hatchery fish that they have in the database over multiple years and all of the, for example, the American River fish that were sampled last year.

So I want to point out that this has -- this is really growing quickly, and our lab has recently evaluated, I believe, the Coleman hatchery, the Central Valley hatcheries, the one here in town, the Nimbus hatchery, the Coleman hatchery up on Battle Creek. I'm not sure if the Mokelumne hatchery, I believe.

MR. WOOSTER: Yes.

MR. THOMPSON: Yes. So these are all in the database.

So if we want to understand -- for example, Nick, you asked about the fish that might have been stocked above Hetch Hetchy and up in there and above O'Shaughnessy Dam, the answer is, we can take a look at

their genotype and compare.

So I want to loop back to one more thing. This really speaks to cost-effectiveness. The database is in place. The genetic techniques are in place. There's a lot that's already in place.

And with one more point I want to make about the method, the very first paper that's in the lit sources describes the genetic method.

I'm not a geneticist, and I would go over my head real quickly, but if you take a look at this, these are personnel at our lab that developed this discovery and characterization of these SNPs, single nucleotide polymorphisms.

John talked earlier about a-hundred-and-some markers. The abstract says that they characterize 139 SNP loci. So those are in the database and they can do this analysis. And then he said they also developed the protocol for all of the matches within these large databases.

MR. DEVINE: I think that helps explain why NMFS would like to have the information, but it doesn't explain why FERC needs the information. FERC has already judged that it doesn't need the information in all these databases, in the American River and all the other places, so I think that's -- we understand that

NMFS would like to get that information and put it to use, but that's not the question here.

MR. THOMPSON: It's a project effect, a project effect from way back is that 120-foot high dam for 120 years blocking gene flow. That is what we're trying to understand. That is a project effect, and we believe FERC should evaluate and order studies to evaluate such project effects.

MR. WOOSTER: The database we're talking about leads to their next question. He asked how can we isolate other anthropogenic effects. That database is what allows you to take the genetic samples from Tuolumne and the populations you have affected, put them into that database, and then it helps you isolate whether there's a hatchery influence or not, whether these fish -- how genetically diverse they are. It's the background information that gives the context to the level of project effect you've had on these populations. That's why we'd like the information, John.

MR. ETTEMA: Okay. I think we'll, let's see, No. 5, we're getting into there right now. You sort of answered No. 5. What about other -- I had some other additional questions here. What about -- how do you -- are you asking for ongoing operational effects or historical effects of the project or is it a

combination? I'm trying to wrap my mind around that. Are you trying to tease out present-day effects or just what --

MR. WOOSTER: I think it's a combination. It's an ongoing effect. It's been going on for 120 years.

If you're asking whether you can separate what happened in the first 120 years and what the genetic effect is this year, that's not possible.

But yeah, it's -- you're looking back in time as well as what is currently happening, project effects, and what is likely -- you know, it helps you inform what is going to happen over the future license.

MR. ETTEMA: Okay. And then as far as other factors, what are some of the main factors that might affect the genetic makeup of these fish? So you've indicated there's some natural barriers that could create some differences in the upper watershed, hatchery influence. Are there any other major items or any other items that --

MR. WOOSTER: Well, all fish upstream of the dam, upstream of the Don Pedro Project, we suspect, but we won't know until the study's complete, that those fish have been selected for against having a migratory gene. That would be a big effect, much in the way you would -- above and below a natural barrier you often

would see the migratory genes selected against for the above-barrier versus below-barrier. So that's a potential effect of this project that you would see -- you would look to evaluate above Don Pedro.

MR. ETTEMA: Any other questions or comments from . . .

MR. THOMPSON: I think John just answered it, but just to add, I think we went over kind of -- sort of missed talking about a major effect of a dam and that's that even if you have downstream passage -- and, Nick, you asked about that earlier -- that it's a one-way passage, and O. mykiss in the upper watershed, smolt, go to the ocean. Those adults cannot come back to that population; right? They're prevented from going back upstream where they originated. Therefore, over time, what happens is that there's no evolutionary advantage to anadromy.

The advantage in anadromy is usually -- and most of the models show -- that adults that could come back from the ocean are much larger than resident fish, so they contain many more eggs, the females.

So that's the advantage that is brought back, you know, the life history advantage, the evolutionary advantage.

I don't think we talked about that, but I think

it's obvious that fish upstream, smolt, that benefit to that population is lost because those returning adults cannot go up there, spawn, and produce more fish up there, up above the La Grange Dam. So that is a -- that is something we want to investigate.

And John is right: The propensity to migrate among those O. mykiss is something that we will be studying. We didn't spell that out, but it is something that's now under study. And if we can get you a copy of the American River study, that preliminary report that we're talking about, you'll see that they saw some differences among the upper American populations in terms of their propensity to migrate.

And so it's kind of expected that what we might see is that O. mykiss just upstream of Don Pedro Reservoir, for example, might migrate down to the lake, down to the reservoir, and then back upstream, more so than O. mykiss somewhere else in the population.

I'm telling you this because the propensity to smolt in anadromy is very important because the listed entity is the steelhead, which is the anadromous form of the O. mykiss.

MR. DEVINE: I'll only add that the -- there are two parts to the 5.9(b)(5). One is project effects and the other is will it inform the development of

license conditions. And in this case it's license conditions that are placed on the license by FERC. So will it inform the development of FERC license conditions. That's FERC.

NMFS can prescribe fishways, and FERC can decide whether to add that fishway to a license or not.

If they decide not to, they don't issue the license, because this was a prescription that FERC cannot change, so it has a choice, to add the conditions, to add those prescriptions as conditions to a license or not.

So the question, though, does it inform license conditions, has to do with whether it informs the development of FERC's license conditions.

FERC has said, as I mentioned previously, that the fish passage assessment that's been proposed in this project is adequate to -- for FERC -- to develop its license condition.

There's an extensive study already proposed that will look at fish passage at the project as a mitigation for a potential effect, for an alleged effect, if you want to call it that, on fish passage.

And if fish passage is decided by FERC to be proper mitigation for some effect, if that's also shown, then they would add that to the license, and that then

deals with the license condition that deals with the project effect.

It's not -- this is different than a -- this information about genetics is still talking about information that NMFS would like to have and that NMFS, if it needs it for its prescription, it is obligated to get. It's not about whether the information will be obtained, from a technical aspect and the science aspect the information should be obtained. The question is: Who's obligated to get it?

MR. EDMONDSON: May I respond to that? This is Steve Edmondson, with NMFS.

I think the fact that FERC's determined that the study wasn't necessary, it's obvious that's the point of this hearing, and that we disagree with that determination is the point of the hearing and something for the Panel to consider.

Whether or not FERC is obligated to collect this information or we use that information in study determination, though, is what we're disagreeing with.

And I think, rather than my opinion or yours or someone else's, I think we can go back to what Congress said when they issued ECPA back in 1986, and the Electric Power Protection Act conference report notes that, and in quotes: "In exercising its

responsibilities in relicensing, the conferees expect the Commission to take into account existing structures and facilities and provide for these nonpower, nondevelopmental values. And consistent with this legislative imperative, the Commission also fully evaluate the environmental harms caused by these structures and facilities in order to give equal consideration of nonpower values as mandated by the Federal Power Act, Section 4(e), and must evaluate relicensing in light of today's standards and concerns and that procedures and substance applicable to the original license, including the treatment of nondevelopmental values, apply fully in relicensing."

And that's from the committee report in 1986. So that's what we're disagreeing. We say that yes, it is necessary, and yes, it's something the Commission should be looking at.

MR. DEVINE: I don't think there's any disagreement it's the scope of the studies that FERC feels are necessary in order to meet the requirements of the ECPA or any other part of the Federal Power Act, and FERC has described in its Study Plan Determination with very meticulous clarity what the scope of that study is that it needs. And NMFS has not actually pointed out in their -- in their -- trying to convince FERC that it

needs it, that FERC needs the information. What NMFS is saying is that NMFS needs the information and FERC should get it for us.

MR. EDMONDSON: And we disagree. We think FERC does need this information. That's the point of this dispute hearing. And we don't think that fish passage is the exclusive domain of the National Marine Fisheries Service. In fact, it is an obligation of FERC as well as the action agency.

MR. DEVINE: And FERC is doing a study of that.

MR. WOOSTER: I'd like to hear from Jim. As John pointed out, you recommended approving the fish-passage study. What are you going to do with that fish-passage study alone and without the genetic information?

MR. HASTREITER: Well, you know, ultimately the way the process works is, 60 days after we issue an REA notice, you will give us preliminary prescriptions and we will evaluate those based on the designs that the Districts have come up with.

MR. DEVINE: Other things that I've seen FERC do with that information is to evaluate whether they think the efficiencies that NMFS would like are practical and are able to be achieved with the project designs that are provided in the license application,

and if they are, they might add that there could be testing done to see that they would be -- meet efficiency. They could comment on the design of those fishways and the attraction flow amounts and many other technical aspects of the fish passage and the cost, and they would consider all those things. I've seen them consider all those things in their assessment of fish passage.

MR. HASTREITER: And there's been cases where, you know, FERC has said that's a good thing to do and there's been other cases where FERC has said it's duty.

MR. AMBROSE: Jim, could you give me an estimate for how much this fish-passage study might cost? Ballpark?

MR. DEVINE: The fish-passage assessment?

MR. AMBROSE: Yes.

MR. DEVINE: The fish-passage assessment cost or the genetics?

MR. AMBROSE: Not the genetics. The fish passage that FERC is requiring.

MR. DEVINE: I'd have to look.

MR. HASTREITER: I can't remember off the top of my head.

MR. DEVINE: It's over a million dollars.

MR. AMBROSE: Okay. So it's over a million

dollars. But what I'm hearing in this discussion is that there's the potential, using a cheaper study, to potentially say fish passage is something we may not want. We have -- for whatever reason. And it seems as though that is the first question that you almost need to ask, do you want to put fish up there or not, versus requiring a fish-passage study that might cost a million dollars. This seems like something that you would almost ask before you make that next step.

MR. DEVINE: We made that point, actually, that -- and that would be a NMFS decision. It's NMFS' decision about reintroduction, not FERC's decision.

MR. HASTREITER: And we had that discussion in the initial study plan meeting, and the Districts, in fact, were totally against doing anything, even coming up with, you know, a fish-passage design, so . . .

MR. DEVINE: I wouldn't say totally against. We were wondering what comes first, the chicken or the egg.

MR. EDMONDSON: But under the Federal Power Act and under the Endangered Species Act it isn't NMFS' sole responsibility for reintroduction and not FERC's. In fact, it's just the opposite.

Under the Endangered Species Act we have obligations -- we don't have -- except in cases where

we're an action agency, our obligations are listing, planning, re-coordination. It's the action agency's responsibility under 7(a)(1) to implement recovery use authorities in furtherance of that. It's not NMFS'.

So this idea that if there's endangered species listed, suddenly NMFS has no responsibility whatsoever in terms of studies or actions isn't true and it's inconsistent with the law or the Federal Power Act. And I read to you from the conferees' report.

So this notion that, well, if it's a listed species, then NMFS has -- or then FERC has no responsibility just isn't true.

MR. DEVINE: I didn't say that. And I haven't heard that said at all.

MR. THOMPSON: Well, again, I gave some examples with parallels to the BLM, with respect to their mandatory conditioning authority under Section 4(e). I gave an example of the State Water Board with their mandatory condition authority under Clean Water Act Section 401, or the Forest Service. What's the difference?

MR. DEVINE: But Larry, neither of them are here.

MR. THOMPSON: When they ask -- when they request for a study, the FERC staff often approves it so

that it will inform their license conditioning authority.

MR. HASTREITER: And usually it's related to the operational characteristics of the project.

MR. THOMPSON: Well, the operational characteristics are going to be important here if we go to a fishway.

MR. WOOSTER: Are we're going to keep the dam that's part of this project?

MR. HASTREITER: I don't know. We haven't made those decisions yet.

MR. WOOSTER: I think in the scoping document I think it was listed. So if the dam is going to stay in place, that operational condition of segmenting the population of the upper and lower, preventing the anadromous gene flow in the upper watershed will be part of your project operations.

MR. THOMPSON: Yes. And we may need to alter project operations, modify them somehow, to make a fishway work.

MR. HASTREITER: I'm looking forward to your recommendation.

MR. THOMPSON: It is -- it is directly related. And we're hoping you have the information, Jim, to make a decision. I heard John say that FERC will decide

whether or not to add a NMFS fishway prescription as a license condition. Will you use any information to decide that?

MR. HASTREITER: I don't think we have -- I don't think that's what John said. Section 18 prescription is mandatory. What John said was if we don't agree with that prescription or we think it's too expensive or not worth it, we just wouldn't issue a license. That's what John said.

MR. ETTEMA: Okay. So we've sort of touched on No. 6, which is: Is the study appropriate? And we sort of talked about the reverse, and then John posed the question, what happens if the genetics study should come before that.

My question is, is, because now we -- there is an approved study plan to look at fish passage and inform, will it inform the design and whether it's feasible, would you say it's a feasibility study?

MR. DEVINE: As a label, a feasibility assessment.

MR. ETTEMA: A feasibility assessment. Okay.

MR. DEVINE: Yeah.

MR. ETTEMA: Okay. So this gets to the heart of justification. If that study were to come back and say no, it's not feasible, then would this study still

be needed to inform fish passage?

MR. WOOSTER: From moving from the lower watershed to the upper watershed, no.

MR. ETTEMA: Are these -- are these studies best -- you know, if you were to do these studies, would you do them all at the same time or would you do them one -- you know, which one would you do first, and should there be a timing component to it?

MR. WOOSTER: I can point to the American River where they decided to do the genetics study first. Within a FERC ILP process, which is timeline driven, I would say you should do them simultaneously.

MR. ETTEMA: Okay. And then I had another question. You know, we talked a little bit about methods and number of samples and that kind of thing, so that gives me an idea of sort of how you're getting to the cost, $75,000 to $125,000, but any specifics as to how you arrived at that number?

MR. WOOSTER: Yeah. The specifics were a rough cost on what the lab cost is per sample. We have been given a cost of about $50 to $70 of lab cost per sample. And the part of that budget that is uncertain is really the field effort to go collect --

(Brief telephone interruption.)

MR. WOOSTER: There's some uncertainty in the

cost invested in the field effort to collect the samples.

MR. ETTEMA: And then I had another one about alternatives, whether or not there is a more cost-effective alternative, whether -- you know, whether existing information or some other ongoing study -- you mentioned that you're doing -- or that you received funding for another genetics study on the Tuolumne River, but it would -- it's a third of the cost of this study. So we've sort of touched on that already. I guess, why -- so why would that study not fill the gap? Why do you need the --

MR. WOOSTER: I'd probably revise our estimated cost of this study to about $150,000. And we've had additional discussions with the Science Center beyond when we finished and drafted this study almost a year ago at this point. It's designed to -- the money we have at this point is designed to contribute to the study. I wouldn't call it a separate study.

MR. ETTEMA: Okay.

MR. WOOSTER: It turns into a separate study if FERC and the Districts aren't involved. But our hope at this point -- when we applied for a competitive grant, our intent at that time was to get money to contribute to this study.

MR. ETTEMA: Okay. And does the study -- the study that you've requested, is that in line with the recovery plan? I'd looked through that and saw that there was a genetics item for the Tuolumne River in the table. Is that -- that study will fulfill that item? I can't recall the table number, but if you go to the Tuolumne River, you know, specific actions, it's on the list, the genetics study. And I'm wondering if that's the same genetic study that's proposed here or if there's a different --

MR. HOLLEY: I think it is. I have the table up right here.

MR. ETTEMA: Yeah.

MR. HOLLEY: It says: "Evaluate Tuolumne River O. mykiss genetics to inform management in anadromous reaches as well as planning for potential reintroduction for the upper river."

So I think our study that we proposed here would be conducted would fulfill that purpose that is called for in the recovery plan.

MR. WOOSTER: When I drafted the proposal for the money that we've received I didn't cite the recovery plan. I specifically cited the FERC project and the project effects, attempting to evaluate the project effects on the Tuolumne River population.

MR. ETTEMA: Okay.

MR. WOOSTER: I think Tom's right. It seems like it would serve dual purposes.

MR. ETTEMA: I was just curious, because the cost, I think, was estimated at -- it was lower, I think, than this one.

MR. HOLLEY: Yeah. This was also done a couple years ago, too.

MR. ETTEMA: Yeah.

MR. HOLLEY: We have more information now.

MR. ETTEMA: Okay. I want to circle back. We talked about samples. Going back to methodology above the dam, above La Grange, Don Pedro, what about below? Do you have an idea of where and how many samples?

MR. WOOSTER: Well, the lower river is pretty much controlled by the -- there's really few fish, so it's kind of as many samples as you can get your hands on, by whatever means.

If you can design a program to -- the limiting factor there is simply going to be the low population, so I think you'd have -- I know that the Districts have proposed and put in a couple weirs as part of their studies. There might be some potential to get samples there.

So, you know, I don't have a great handle on

exactly how many samples. If you're trying to run the cost of how many samples you'd collect, I'm not sure about that. But again, I think you're going to want 25 to 50 samples ideally to characterize each spatial and temporal aspect.

MR. ETTEMA: Okay. Any other questions from the Panel?

MR. AMBROSE: I just keep coming back to -- I don't know if this is a question so much, but I just keep coming back to using money and using it wisely.

And, Larry, from what you talked about earlier, you stated that there's a potential for genetics studies to either lead to a recommendation for fish passage or not; correct?

MR. THOMPSON: Mm-hmm.

MR. AMBROSE: And that would be based on genetics. For $150,000. And that, to me, seems like a really important question to answer before asking the Districts to pay a million dollars for a fish-passage feasibility study. And so that just seems like a real key and fundamental question.

And I -- in having worked on a project in the Pajaro River in Santa Clara County, this is something that came up before, where we had O. mykiss above a dam and we had steelhead below, and there was a -- and the

steelhead above the dam were of the -- one of the few remnant populations of O. mykiss left in the Pajaro River. Fish below the dam were of hatchery origin. We made a decision not to move forward with fish passage as part of the Santa Clara Valley Habitat Conservation Plan.

So it seems like a real fundamental piece here. And I'm just wrestling with, you know, FERC's decision to not move forward with that.

And one of the questions I asked earlier was: Is this a FERC policy decision? You mentioned that looking at previous decisions in regard to genetics and that FERC has not required those.

Is that a policy of FERC not to move forward with genetics-type studies or is it on a case-by-case basis?

MR. HASTREITER: It's a case-by-case basis.

You know, Larry, I think, commented in one of your filings that he's never seen a written -- or Steve -- FERC policy. But we have discussions among staff concerning all of these study requests. And, you know, essentially we feel that it's more related to a fishery management decision. And that's where we are.

And then just commenting on, you know, your timing question, you know, the Districts initially were

interested in doing a traditional licensing process, which would, okay, versus an integrated licensing process, which is what we are doing, and that's on very tight time frames and decision points. It doesn't allow the sort of thing that you're suggesting, which John already pointed out, that they have to be done together. The Districts were interested in doing the TLP. That may allow for that sort of sequencing. However, National Marine Fisheries Service and others did not want the Districts to use the traditional licensing process. So, you know, there was an option maybe for that sort of sequencing, but National Marine Fisheries Service didn't go that way.

MR. AMBROSE: Thank you.

MR. THOMPSON: Can I just ask Jim?

So I think what I heard, there is no written FERC policy regarding genetics study that you can provide to the Panel; right?

MR. HASTREITER: Right.

MR. THOMPSON: But you mentioned that there are internal discussions that you have. Are there any notes from those or anything that you could provide us in addition to this single paragraph on page B-18 of the study plan?

MR. HASTREITER: No.

MR. THOMPSON: I'm sensing that that's what they're struggling with. You're simply saying you consider the research effort, and it may be needed to make the fishery management decisions, but not for the development of license conditions. And that's really terse. And you also refer to another project and the decision made in that docket, in that licensing process, which was -- is different, as you said, circumstances, you look at this on a case-by-case basis. Is there any case-by-case information you can give us here?

MR. HASTREITER: No. Those discussions are, you know, not for public consumption when we make those sorts of decisions.

And I don't think the Panel's struggling with our decision, Larry. I think it's National Marine Fisheries Service. And, you know, I've already stated our case and our justification for why we made those decisions, so it is what it is.

MR. CRAVEN: Did you say the Panel is not struggling with that?

MR. HASTREITER: Well, NMFS asked for the dispute, so . . .

MR. CRAVEN: Yeah.

MR. THOMPSON: Richard, are you saying you're struggling? I think you're struggling with how this

information would not develop -- would not be used to develop license conditions.

MR. HASTREITER: Well, I'm glad you're helping the Panel make their mind up, Larry.

MR. CRAVEN: Let me write that down.

MR. HASTREITER: Very good.

MR. THOMPSON: Well, let's hear from the Panel. Are you struggling?

MR. ETTEMA: The Panel will not discuss its thinking at this time. We will provide our recommendations in a filing in a few weeks.

MR. HASTREITER: These are never easy decisions.

MR. ETTEMA: Right.

MR. HASTREITER: There's a lot of information, a lot of policy. There's a lot of history. It's a tough decision.

MR. THOMPSON: Which can't be -- policy which cannot be provided to the Panel.

MR. DEVINE: Well, I'm not sure it's a policy question. Maybe it is, maybe it isn't. It's way beyond even the Districts. But there is going to be a large amount of information developed on the record and for the record with respect to fish passage at La Grange and Don Pedro by virtue of the study that the Districts have

proposed and that FERC has approved. And it will deal with many, many aspects of whether fish passage at La Grange and Don Pedro is feasible, and it will look at different options for fish passage: volitional, nonvolitional, downstream passage options, upstream passage options. And all of this will be in collaborations with NMFS and other agencies and licensing participants. And that is what FERC will use to base, on the record, their decision on whether fish passage is feasible.

If fish passage is judged to be feasible from that perspective, then that will be -- you know, from that perspective of FERC's, separate from NMFS' views and NMFS' studies of the need for fish passage to accomplish its goals related to the recovery plan.

Fish will have -- NMFS will have -- FERC will have a large amount of information to decide whether fish passage is important and justified on the record and in the public interest from the record that's developed just by the studies that are proposed.

MR. ETTEMA: Okay. Thanks.

We are at 12:15 right now. Now, I have an item on the agenda for additional questions or comments, and part of this section and part of this item is for members or the observers in the back. If there is

anyone that would like to propose a comment that's related to the study criteria or any bit of information, we have a little bit of time, I would allow a handful of comments. A show of hands. Does anyone wish to provide a comment? One person.

Okay. Please, sir, if you could stand up and state your name for the record and . . .

MR. SHUTES: I'll come forward.

My name is Chris Shutes. I'm the FERC projects director for the California Sport Fishing Protection Alliance. I'm also here today in part representing the California Hydropower Reform Coalition, of which I'm vice-chair.

I'd like to speak principally to the question about whether the information required is required for the needs of FERC or for the needs of the agency, NMFS, or both.

It seems to me, first of all, in order to have a study dispute process, in order to get in the door, it has to be a mandatory license -- mandatory conditioning agency which asks for the study dispute process, and it must, in doing so, justify why its authority would be used or how it's affected in order to actually meet the qualifications or the bar for the study -- or for the dispute.

Mr. Hastreiter said in his comments that basically NMFS has the lead on fish passage, so it seems to me that in some regard the Commission tends, by practice and by policy, to delegate responsibility for fish passage to NMFS as the lead on that particular issue.

However, under the Federal Power Act the Commission is responsible to produce a license that is in the public interest. And certainly, part of the public interest has to do with fish passage.

If the Commission decides to delegate that portion of the public interest to NMFS as the lead, that's the Commission's decision, but still, it is responsible, under its public interest requirements, to make sure that the license -- the information collected and the license issued meets the bar that it's required to meet according to the Federal Power Act.

It seems to me that there's this sort of procedural trap that's set up for NMFS, because they, on the one hand, have to say how it would -- how their authority is affected in order to get in the door, but then there's the contrary position that the information would be used for NMFS' information and edification and not for that of the Commission as a whole.

It sounds to me like either the determination

that there's no public interest in fish passage in this proceeding is predecisional or that there is -- there needs to be some accomodation made for NMFS to take on that aspect of the public interest.

And I would say that there is clearly a public interest in fish passage in the state of California and rim dams, at rim dams in the Central Valley.

In 19 -- in 2014, 95 percent of the winter-run Chinook downstream of Lake Shasta were believed to have perished because conditions downstream of the rim dam there were not sufficient to maintain conditions that allowed them to live.

The total survival of spring-run Chinook in 2014 in California was estimated at around 7,000 fish total escapement.

It seems to me that it is at least arguable that from the point of view of FERC there is a significant public interest in examining and considering fish passage from the point of view of the Commission as well as whatever NMFS' planning and recovery responsibility may be.

I think you, as Panel members, although you're not cast with deciding policy or law, effectively the entry in the door argument made by the Districts and made in their comments that were issued before the study

dispute process, before the Panel was convened, seek to persuade you that there's no obligation on the part of FERC to order a study. And while there's no obligation, there is an opportunity, and there's nothing that says that FERC can't do that. And I'd say that there's a greater obligation in protecting the public interest for you to take it on and consider it.

We're going to file comments on these issues in response to this proceeding, because we think it has general policy applications.

In the real world I agree with Mr. Thompson that most of the time when it comes to the other mandatory conditioning agencies FERC doesn't make a distinction between whether it needs the information or the agencies need the information; and particularly, I would add, when there's agreement between the agencies and the licensee, FERC doesn't make that distinction, as there was in the case of the study that we're not talking about today, the habitat study.

So I think that what we're dealing with here goes to broader policy, and you all need to think about this in terms other simply than whether there's an obligation of the Commission to order a study simply for the benefit of this agency.

Thank you very much.

MR. ETTEMA: Okay. Thank you for your comments.

All right. If there are no other pressing questions -- you have one from John.

MR. DEVINE: Could I just comment on that?

MR. ETTEMA: Sure, you can provide comments.

MR. DEVINE: If you could respond to the public interest, because they require the Districts to do the fish-passage study.

MR. HASTREITER: My only comment is, you know, apparently Chris misunderstood. I don't think we said FERC is delegating fish-passage responsibility to NMFS. I think what we did say is it's NMFS' responsibility to make decisions about reintroduction --

MR. ETTEMA: Okay.

MR. HASTREITER: -- which, from our perspective, is a different matter.

MR. ETTEMA: Okay. We have a little bit of time here, so if you have another question?

MR. THOMPSON: I mean, reintroduction can be fish passage. I mean, I think -- Jim, are you making a distinction between a reintroduction that happens due to fish-passage license conditions on a FERC project and another type of reintroduction? Because we want to be clear, we're -- the reintroduction we're talking about

here and we came here to dispute, a study that would inform that, is for a license condition at the project for fish passage. That -- that is the reintroduction that we're contemplating.

MR. HASTREITER: Right.

MR. THOMPSON: Is there a distinction?

MR. HASTREITER: No. It's a sequencing. And that's what I said early on, that National Marine Fisheries Service needs to make a decision whether reintroducing fish into the upper basin is in the best interest of the recovery plan, whatever your intentions are. Once you make that decision, then you will make a decision on whether you're going to submit a Section 18 prescription. It's a sequencing.

MR. THOMPSON: And my only response would be, we start by requesting a study to inform that decision. And that certainly seems like a logical thing to do.

MR. HASTREITER: Which is your responsibility. Right.

MR. ETTEMA: Thank you.

MS. REED: Can I make a comment? And I'll come up so the thing can be recorded.

I do want -- I know that Steve has mentioned this, and I'm not a FERC expert, but I do -- my authorities within NMFS do focus on the Endangered

Species Act. Steve did mention Section 7(a)(1) of the Endangered Species Act, which is -- you tend to talk about Section 7 as being a process for consulting after a project description has been defined in terms of how the agency -- how NMFS can assure that the agency is going to complete the project and the purposes of what you're trying to do in a manner that does not jeopardize the continued existence, survival, and recovery of the species.

The Section 7(a)(1) very clearly identifies that NMFS has a role to work with the agencies to look at the programs administered by that agency and to -- it says: "All other federal agencies" -- which would include FERC -- "shall, in consultation with and with the assistance of the Secretary" -- in this case Commerce, NMFS -- "utilize their authority conferred on them for the purposes of this Act" -- the Endangered Species Act -- "by carrying out programs for the conservation of endangered species and threatened species listed pursuant to Section 4 of this Act."

So I think there seems to be in this process a bit of a push-pull about whose job it is to make this passage determination. And I think the FERC process may have some lines that you're trying to draw some fairly firm lines in the sand, but I think the point that our

team is trying to make is that you're also dealing with the Endangered Species Act. And FERC has responsibilities and authorities there to work in concert with. We are here to consult and to assist FERC in making that decision.

And I think one of the questions that John may have asked earlier was, would this genetic information lead to a decision that would say you would not recommend passage. And I think the answer to what was it could. That is the type of information that could be developed from the genetic information.

So I think that might be something that FERC would want to consider, maybe going to Jon Ambrose' question about -- too many Johns in the room.

MR. AMBROSE: There are.

MS. REED: And is kind of what is the series of information that you need to get, you know, is the habitat stuff more important than the genetics or the genetics -- give you that information first perhaps with the FERC timelines and the prescriptive time window that we have, maybe it is more judicious to look at getting this information all at once, because that's when you have to make the decision.

So that's -- I hope that's helpful and maybe does put the context and the role of the federal

agencies in both a FERC and ESA context.

MR. ETTEMA: Okay. Thank you. And we'll --

MR. WOOSTER: Time for one quick --

MR. ETTEMA: Very quick.

MR. WOOSTER: Okay. This was -- I know Jon Ambrose has had some -- the math didn't quite work, the 150 here and the million for the fish-passage feasibility.

I just wanted to point out that the way the Districts crafted their fish-passage feasibility study, there's a lot more in there than just fish passage. There's evaluations of stranding risks by the powerhouse, powerhouse entrainment, some other kinds of environmental conditions that, you know, a survey near the powerhouse, putting in some weirs that count fish coming up. So it's -- the balance there, I don't know if you have a breakdown of what portion of that study was for the fish-passage part, but it's not quite 150 to a million. There's a lot wrapped in that million, as I understand it.

MR. DEVINE: I just want to -- it's all in the study plan.

MR. HASTREITER: It's a comprehensive plan.

MR. WOOSTER: It's a big plan.

MR. DEVINE: It's in the revised study plan. I

wouldn't want to draw any -- just take a look at that and that breaks it down.

MR. ETTEMA: Okay. That brings us to closing statements. I assume folks want to make those or -- who would like to go first?

MR. DEVINE: We just want to thank the Panel for conducting the meeting, and we appreciate the opportunity to participate.

MR. ETTEMA: Okay.

MR. HASTREITER: I would like to echo the same, and I'm sorry you have to deal with this perplexing matter, but I'm sure you'll make a wise decision. Thank you.

MR. EDMONDSON: I defer to Larry for our closing statement, but I want to thank everybody for coming out. And it's -- NMFS really does appreciate -- and the Panel. It's a lot of work and a lot of hours, and it's in our interest. And that's -- you know, we really appreciate that. And thanks for everyone coming out here.

And also, I don't know if folks noticed, this is very professional, very well run, and I think that some of the issues got contentious or potentially could have become, I don't know, unprofessional, but folks maintained professional posture, and I thought it went

really well, so thanks to everybody.

MR. ETTEMA: Larry.

MR. THOMPSON: Sure. I mean, I think I'd just like to say what -- again, thank the Panel, as others have, and point out that what we've done here today, we think we came and we explained the project effect, that is, the gene-flow barrier effect of La Grange Dam. We explained that that effect was on O. mykiss and the genetic makeup of that species. That's what the regulations require.

We also explained how the genetics information would inform a fish passage license condition. That is also something that Regulation 5.9(b)(5) requires us to do and we did that. They would inform the development. So you've got to start somewhere and you need to develop license conditions. This is information to inform that development. We think that's pretty clear.

When I -- I was a panelist at one time, so I know the job that the Panel has now facing it. I sat in Jon Ambrose' chair for one of these FERC projects. I was the agency panelist, and so I'm familiar with the regulations at Section 514(k) which tells you what you have to do now. And you -- the regulations say you shall make and deliver to the Director of the Office of Energy Projects a finding with respect to each

information or study request in dispute -- we only had one here -- concerning the extent to which criteria set forth in Section 5.9(b) is met or not met and why, and then make a recommendation regarding the dispute request based on that finding.

So it's not an easy job, but it's pretty clear. And I'm reading that because there was a lot of discussion here today about who's responsible for collecting the information, but I do not find that anywhere in Section 5.9(b). I think that's an issue that has been discussed here, but it's not in the regulations and it's not what the regulations chart you with evaluating. And I think that's pretty clear.

So again, thanks. And I agree with Steve. It gets a little contentious. I hope it was professional. And I thank Richard and Jon and Nick. Thank you very much.

MR. HASTREITER: I just want to follow up, because Larry mentioned he was on a panel and it's very tough. And the Panel that Larry was on, the other two panelists agreed on measures which Larry would not agree to, and the two panelists submitted their findings and Larry submitted separate findings because he didn't agree with the other two panelists.

So it's not an easy job. It's very difficult.

And sometimes it just comes from the perspective that you start with and what your job is. So good luck.

MR. THOMPSON: But in response to that, there were some 17 -- there were some 17 studies, Jim, and more than one agency involved, so agreeing on all 17 with several study elements within each study.

MR. HASTREITER: It's been the only case where that has happened. It's tough.

MR. THOMPSON: It was pretty difficult.

MR. HASTREITER: Yeah.

MR. ETTEMA: All right. Well, thanks, everybody for coming out.

I'm going to move on to next steps, sort of go over the timeline here.

So now the Panel -- we will enter into deliberations. We're going to be talking about this over the next few weeks. The date I have here is -- for our recommendations to go to the Director is April 14th.

And we spoke earlier this morning about potential filings or comments that may be filed, and if anyone would like for us to consider any further comments or provide any filings -- we talked about the five-year review, the Lindley, et al., paper and the study plan or report on the American River, I think we talked about --

MR. WOOSTER: I'm not sure how much is available.

MR. ETTEMA: Okay.

MR. WOOSTER: The American River is very much a study in progress.

MR. ETTEMA: Okay. There may have been a few others, but that's what I noted here at the end as far as filing.

MR. DEVINE: Would you like to write down the costs?

MR. ETTEMA: I think that's already -- that would already be on the record for the fish-passage study.

MR. DEVINE: I believe so. But if it's not adequate for your needs, then let us know.

MR. ETTEMA: Okay. We can do that. So if you would like to submit additional comments, or as far as submitting these other papers, we'd ask that you submit them by close of business April 7th, and that would be FERC headquarters' close of business, so 5:00 p.m. Eastern time. Other than that --

MR. THOMPSON: Just for clarification, were you going to send -- like, put something out, a request, itemizing what you're requesting, sort of like you did last time, or should we just --

MR. ETTEMA: I won't be doing any further requests. You know, I've requested that five-year review and the Lindley, et al., paper today.

MR. THOMPSON: Okay.

MR. ETTEMA: And, you know, you've suggested filing that study report. Based on the comments made, I think that would be -- I think that would be prudent to file the American River study plan or study report.

MR. THOMPSON: Okay.

MR. ETTEMA: And yeah, as far as what the Panel will consider, I will reiterate that 5.9(b) will be the cornerstone of our -- we will follow the regulations. Richard, Jon, and I signed the Expectation of the Panel this morning and we've adhered to the guidelines since the beginning of this process and will continue to do so.

After we submit our recommendations, I have here the Commission -- or the Director will issue its decision on May 4th, 2015, is the time limit we've come up with, so -- and I'd like to remind everybody that the Commission has an open, you know, comment strategy. You can file comments at any time. If you want us to consider your comments, I'm asking that they be submitted by next Tuesday. If there's other comments that you would like the Commission to consider as it

considers the Panel's recommendations, you can go ahead and file comments after that date as well.

All right. With that I'll thank everyone for coming out. I think everyone conducted themselves very professionally, and it was a productive meeting. So thank you for your time and for your input.

(Time noted: 12:40 p.m.)

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