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FEDERAL ENERGY REGULATORY COMMISSION

Loup River Public Power District
Project No. 1256-029-Nebraska

Loup River
Hydroelectric Project
(FERC No. 1256-029)
Study Plan Discussion

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(Whereupon, the following proceedings were had, to-wit:)

NEAL SUESS: We will get started this morning, and that way we can get through the agenda today.

Again, I want to welcome you back to Columbus for the second day of our hydro relicensing proposed study plan meeting. We got through a lot of information yesterday, and it looks like we're going to try to get through a lot of information again today.

So I don't know -- about the only new person I see that's here today is one of our directors, Robert Clausen, over in the -- over in the corner over there. And Robert is the chairman of our board. He is also a stakeholder in the fact that he owns ground along the canal and is a canal user from the irrigation standpoint.

So with that, I will turn it back over to Lisa and Stephanie, and we will continue to go down the goals and objectives of our study plans.

LISA RICHARDSON: Good morning. I had -- I just turned it off -- I had my cell phone over here with the microphone to see if that would work, but it was creating some interference. I

could hear you twice.

Okay. So we've got the microphones going today. A couple of things I want to talk to you about. We don't have anybody on the phone yet, but we expect to have two participants sometime throughout the day, so we'll stick with the microphones -- oh, I hear somebody on the phone. Just a second. Is that you, Kim?

KIM NGUYEN: Yes.

STEPHANIE WHITE: We've changed our AV equipment, so it will be a lot easier for you to hear us and us to hear you. So speak up when you have a comment.

KIM NGUYEN: Okay. Thanks.

STEPHANIE WHITE: The second thing is, it's a lot easier for Krissy to hear you when you use the microphone. A little bit of microphone etiquette for you, the microphones work best when they're held at an angle. They don't work very well like this, much better like this. And they need to be within 1 to 2 inches of your face. So it doesn't work out here as well as it does here. And when you turn your head, you need to follow with the microphone so that everybody can hear. I'll interrupt you to remind you of those things as we

move forward, and pretty soon I think we'll all get the hang of it.

The second thing, I had some requests to minimize side conversations today, so I'll be a lot more aggressive about that. I know that they are fruitful sometimes and useful. I'll tolerate them for a little bit, and I'll probably kind of migrate over, and we'll all know that's why.

We're starting with Objective 5 on Sedimentation today. Did everybody bring their agenda back? Does anybody need one? I have a whole stack that I will share. Dennis?

NEAL SUESS: That reminds me, there is one other guest over there, a new individual, Dennis Grennan from HDR. He is our project liaison, and he'll also be sitting in the corner. If you don't show up on the first day, you have to sit in the corner, so sorry about that.

STEPHANIE WHITE: So you'll need your agenda. It looks like everybody has their name place. Those are numbered for Krissy so it makes it easier for her to track speakers. If you can make sure to have it in the front and angled at her -- I see Gary, you'll going to want to angle yours at Krissy. That's perfect.

Otherwise, you need to have your voting cards. If you don't have a stack, let me know. I see everybody's got a full deck.

All right. Let's get started with Sedimentation, Objective 5. Before we do, Lisa, if you have a few words, you're welcome to share them with the group. Otherwise, we'll just dive right in.

LISA RICHARDSON: Okay. As Stephanie mentioned yesterday, we have some -- we have some -- a couple of objectives that we didn't reach full consensus on last time. This is one of them. The objective as it's written up there, To determine if sediment transport is a limiting factor for pallid sturgeon habitat in the lower Platte River below the Elkhorn River, there was agreement on that aspect of the objective. What there wasn't agreement on was the idea of expanding that beyond the Elkhorn, or above the Elkhorn. That's what there was not agreement on.

So I think we would like to maybe talk about this as it stands and then go back. And if we need more discussion on the pallid above the Elkhorn, we can certainly have that now.

But I think we can talk about the

activities as they relate to the objective as it's written, because there was agreement on that, unless somebody has some other suggestions or would like to do something different.

STEPHANIE WHITE: So here's the objective, To determine if sediment transport is a limiting factor for pallid sturgeon habitat in the lower Platte River below the Elkhorn. Activities: To determine if the Project is affecting sediment transport; and if the Project is affecting sediment transport, determine the extent using effective discharge calculations and aggradation/degradation analysis; and compare to other rivers used by the pallid sturgeon.

We'll just open the floor for questions or comments, certainly open discussion. And I'll walk around and turn on your mikes.

Go ahead, you can start.

MATT PILLARD: Yeah, I'll just elaborate a little bit on what the intent is here. It's first to use the activities that are done in the previous objectives of the sedimentation task to determine if, indeed, the lower Platte River is the -- what's going on from a sediment transport perspective, looking at those sediment transport

indicators, is the river aggrading or degrading or at equilibrium.

Depending on the results of those, if we show it is in equilibrium, we would conclude at that point that the morphology of the river isn't changing, therefore our -- is there anything really changing from a sturgeon habitat perspective.

If the river is aggrading or degrading, we'll look at what is the extent of that action by looking at modifying our sediment transport indicators and parameters and looking at what is the magnitude of that change relative to the Project, how does the Project affect those operations.

Depending on what change is there, the idea would be to look at other locations where the pallid sturgeon exists and look at the parameters, like flow and sediment transport and morphology of those other river systems where we know pallid sturgeons are prevalent and see what is different between the lower Platte and those rivers, what are the ranges of flows and temperatures and potential sediment transport parameters that exist to where those pallid sturgeon exist in other systems compared to where they exist on ours.

So that's a little bit more explanation of

what we intend to do with the activities associated with this objective.

STEPHANIE WHITE: Go ahead, Rich.

RICHARD HOLLAND: I just want to know how you're going to define equilibrium. I know the term that's used in the document has been quasi equilibrium. What's your -- what's your bounds of equilibrium for the Platte? Do you have a feeling for that at this point?

PAT ENGELBERT: I think Matt meant quasi equilibrium because it's -- it is a mobile bed, it's a sand bed, it's always going to be moving. I think it's not necessarily aggrading or degrading, but kind of in a state of quasi equilibrium.

GARY LEWIS: Gary Lewis with HDR.

I can comment on that because it's been applied in the Central Platte over the years that I've worked up there. It's a -- probably a better term is dynamic equilibrium than quasi equilibrium. Quasi implies it's not quite there, and that isn't what we mean by it.

But dynamic equilibrium means if you look at the river and it's braiding and the form of the bars and vegetation encroachment or lack of it at

one point in time, and years later you look at it again, nothing is where it was on the first set of photographs, but it looks the same. And if you got down in the river, it would be the same.

It would still have pretty much the same characteristics of width. The bars would still be there. They'd be at different locations because they're constantly changing. That's the dynamic of it. That's the problem with snapshots in time. You can go out and do a transect, measure a cross section, and a week later, it could be different.

So it's in equilibrium because its form is still braided. Its general characteristics that are defined in a number of different morphological factors -- we can talk about it if we need to -- but those aren't changing. And the measure of that, the effective discharge, is the best available tool to measure whether that equilibrium exists.

If that effective discharge is not changing because we're not tinkering with the flow or the sediment -- because those two build into that equation -- if we're not tinkering with those and if we don't have vegetation encroachment, which does impact equilibrium, it may not be caused by the river, but from other factors.

If that's not occurring, you have to look at photos and things like that to know if that's occurring. But the dynamic equilibrium is measured by the effective discharge and you might say how much change and --

RICHARD HOLLAND: That was my next question.

GARY LEWIS: I suspected that might be coming.

I've looked at effective discharge on the Central Platte over the years. Back in the '80s is when I started getting involved in that. And we were looking at effective discharges at Overton, Grand Island, all the way up and down the river at those stations that were important to the Central Platte on a cumulative basis from pre and post development. We looked at those, and there was, you know, 2- to 300 CFS of 3,000, 10 percent change over those years, sometimes up, sometimes down.

And through an awful lot of purview and oversight by a lot of special interest groups and stakeholders it was pretty much accepted that that range sort of reflected no change. That was certainly my opinion. And, you know, I was giving

testimony, in fact, on water rights applications and survived cross-examination on that.

So those numbers, you know, how much change is good, in that order of magnitude, 10 percent or so would suggest, just on the basis of how we do the calculations, that we're probably still in quasi or in dynamic equilibrium.

What I'd be concerned about is seeing a change of, oh, 20 to 70 percent in effective discharge, and that could happen. If we really altered the flow, if somehow the sediment supply was changed dramatically and we saw that amount of change, I would expect to see some changes occurring in the morphology of the river, and we ought to be seeing it shifting from braided to anabranched.

If you look at the Central Platte, that presumably was braided in the settlement days; it's anabranched now. A braided stream is a transitional form of a meandering stream, and on the route from braided to meandering is anabranched. So something happened in the Central Platte that caused it to become an anabranched river instead of a braided river.

The lower Platte is still braided; it always has been. There's really no detectable

change, from what evidence I've looked at -- and I can't say it's exhaustive yet -- no change in the form of the lower Platte River.

So that's a long answer, but I think it's important that people understand where we're going with this effective discharge, dynamic equilibrium, how we're going to use the results of these effective discharge calculations to know if there is some impact or not on the Project.

RICHARD HOLLAND: Is your estimate of change -- it's relative to your reference point of where you're starting, I assume that's how your -- your 10 percent change that would be within that range is going to be relative to what time frame you're starting your -- your comparison?

GARY LEWIS: They -- it's different in the lower Platte than it was in the Central because we did have data predevelopment and postdevelopment, and here we don't have pre-Project data.

So the change that would be the -- sort of the existing operations versus some other scenario, we'll do the calculations on that. We can't -- we also will look at year to year and season -- or wet and dry cycle to cycle periods, see if the effective

discharge is drifting up or down through those, so that kind of change can be detected.

And if there was, for example, a dive in the effective discharge -- which isn't good or bad, by the way -- if there was a dive in the '40s or '50s when we had a severe drought, and if that came back later, that would give us the -- an idea of the range that the system seems to be able to tolerate and still provide habitat. So that actually helps us fix that 5 percent, 20 percent, whatever it is, if there was no recorded impact on habitat. Because we just don't have the data to compare to.

So I'm answering vaguely there, but we don't have a pre -- before Project and after Project data set that we can evaluate change.

RICHARD HOLLAND: But you'll -- I'm assuming, from what you just said, that you'll make some effort to document the variance associated with this based on the period of record that you do have?

GARY LEWIS: Absolutely.

RICHARD HOLLAND: So that kind of analysis will be set forth so we can at least get -- if nothing else, we'll get an appraisal of just how these parameters are changing regardless, so --

GARY LEWIS: Correct. And it isn't

just effective discharge, whatever other information is available. We talked yesterday about usage and productivity, nesting data, any of that that's available will be sidetracked against this floating indicator of dynamic equilibrium in the river. And you just track those alongside, and as a scientist, you have to make sense out of it and draw conclusions.

RICHARD HOLLAND: Sure.

STEPHANIE WHITE: Do we have questions and comments on the associated activities or this objective as it stands right now?

JEFF RUNGE: The situation in regards to limiting is similar for the situation with the least tern and piping plover. In order to identify that something is limiting, that a certain factor is limiting, you've got to have some idea of the other factors that are affecting the species or affecting their habitat.

And right now, there's changes in hydrology, quantity of water, quality of water, species interactions, there's all sorts of factors that may mask whether sediment is limiting or not.

And I think that to better address this, I do believe that a lot of the work that we're doing

in the previous objectives and addressing those objectives will help to better address what direct impact those changes in sediment will have on habitat, if any. And I think that's really the best measurement that we can use to assess what level of impact that has on the pallid.

For us to really identify that sediment is limiting for the pallid would require a very extensive set of research, and especially if we're going to be comparing different river systems.

RICHARD HOLLAND: I agree with what Jeff said. However, the objective is related not as a limiting factor for pallid sturgeon, but it's a limiting factor for pallid sturgeon habitat. So what we have to do is we have to define what we're considering pallid sturgeon habitat and then document how that is changing and being influenced by these -- the sedimentation parameters.

We will not -- realistically, we will not have the numbers of pallid sturgeon to make an assessment of any impact -- limiting impact on pallid sturgeon. We're going to have to assume that until simply the science catches up.

So the key is the habitat and how it's being limiting, if it's being limited, in this

sense, I think, so --

JOHN SHADLE: John Shadle. I'm trying to use my microphone etiquette. Is this good?

STEPHANIE WHITE: You're doing great.

JOHN SHADLE: My question kind of follows up with Rick. How are we going to determine what sturgeon habitat is? The science is now, as Rick just described, catching up. So how is it that we're going to define sturgeon habitat?

The one study that we do have on the Platte River was done by Dr. Peters, and it was found that these fish use a large range of different types of habitats. And so I struggle with the fact that, again, we're going to take the hydro Loup system and try to define how it's going to impact.

So No. 1, we struggle with trying to know what pallid sturgeon habitat is, and then now we're going to then try to extrapolate and figure out how this hydro Loup River system is impacting these fish ninety or a hundred miles away.

JEFF RUNGE: One things, if I could help to address that point, the Platte River Program, which John and I are a part of here, has developed a stage change study that would evaluate

the changes in Program flow and how that would impact habitats in the lower Platte River. And I know, too, that Pat and others from HDR have been working on this -- on this study, this lower Platte River stage change study.

So I guess maybe to turn it over to you, how would you, or how have you, or how you going to quantify habitat for the pallid sturgeon?

PAT ENGELBERT: The study, for those of you that are not aware, is we were under contract with the Platte River Program to look at how the changes in stage in the Platte River affect the dynamics of depth and velocity, flow area, stage, things of that nature.

One thing that we're going to look at is a representative reach of the lower Platte, that being between the U.S. 50 bridge and the pedestrian bridge, the old BN Railroad bridge that's just upstream. And then from that, we've gone down to a mesoscale level of about a 1500-foot stretch of the Platte River and done a very detailed survey of the sandbar formations, et cetera.

And in working with Dr. Mark Pegg at the university, I've identified seven different classifications on that particular bed form. And as

the stage increases or decreases, we are going to look to see how those classifications are changing.

So we would anticipate -- we've done two-thirds of the data collection effort. We are beginning to look at our results at this point. But I would anticipate that if the results are favorable, they get reviewed, et cetera, that that would be something that we could incorporate -- you know, the results of that analysis, once it goes through the proper channels, could be incorporated into this particular project -- or the research that was done on behalf of that project could be incorporated into our assessment of this particular project.

JEFF RUNGE: And so I guess if I can propose that we use the same indices for habitat that apply to the Project, there may be other indices that you're measuring, such as water quality, that isn't directly related to the Project here, but if we could apply some of those same indices, I think that standardization would be helpful.

And if we don't feel that these indices within the stage change study is appropriate, then I think it's our obligation here, as the program and

reviewing the methods here for the Loup, to come out and say what changes we'd like to see.

PAT ENGELBERT: I'm unclear of your last comment there, Jeff, relative to changes, or what are you proposing here?

JEFF RUNGE: Well, I think that we need to review your methods, your indices for pallid sturgeon habitat for the stage change study, and is that appropriate to apply for our work here in the Loup Power District.

And if not, if we find out that there's -- that -- there's a question about habitat that was raised right now. If there's a need for change, then we should probably identify this right away. We should probably review this work right now and propose these changes for the Loup Power District monitoring.

PAT ENGELBERT: I'm a little unclear as to why there would be a change, I guess, in those indices in that we proposed those to the program, the program sent them out for review. I don't know if your agency had a chance to look at those.

JEFF RUNGE: Yeah.

PAT ENGELBERT: I'm guessing they did. If they were accepted for that, I'm not quite

sure why there would need to be a revision of that again, that's just one small component of research we would be pulling into that, as well as ongoing work by Dr. Mark Pegg and others, I'm sure would be pulled into the assessment of this particular project.

Again, our focus here is to look at the effects of Loup's Project operations on this particular species and relative to a baseline condition. I want to make sure that we focus on that and not just go study every little thing under the sun.

JEFF RUNGE: And I agree too. I guess it sounds as if there's multiple interpretations as to what is habitat. And we reviewed your project, and we feel those indices were appropriate.

I guess if there's a different opinion as to what habitat is for the pallid sturgeon, we should probably have participants in this group bring this up now and quickly while we're developing these methods. That was just what I was simply trying to bring up.

Otherwise, I feel that your methods and your indices for pallid sturgeon habitat is

appropriate to apply for the Loup for those factors that are affected by the Loup Project.

GEORGE WALDOW: May I just change the direction of this discussion a little bit?

As a nonbiologist, when we looked at this approach, I was -- my mindset was that the -- the habitat of the pallid sturgeon -- and I think the term in the literature is the associated habitat reach of the pallid sturgeon is the reach below the Elkhorn confluence, and it was reviewed by the National Academy and described as excellent habitat for the species, largely unchanged from its historical criteria.

And what I'm looking at here is going down into these associated activities and going to the what if part of it. If we do an analysis of sediment transport aggradation/degradation with dynamic equilibrium and our analysis shows that the Loup Project is not having -- is not changing what's existing and has existed in that habitat reach, then the -- any further question of Project impact becomes a moot point because if there are changes that occur in the study that Pat brought up due to stage changes -- and these, as I understand, are fairly large changes in stage due to annual type

events -- that's a different issue. Large stage changes are different than Project effects due to the Loup operation. So there's a departure there that I think we would need to keep in mind.

And while it's interesting to subdivide all of the parameters that define pallid sturgeon habitat, that may be getting beyond what's appropriate for this relicensing analysis. I think we're trying to define incremental impacts of the Project on sedimentation in the reach below the Elkhorn.

And if we find changes, there's a need to categorize, quantify, analyze whatever is necessary to further understand the changes. But if our analysis shows that there's no change, then to me, that study is over.

JEFF RUNGE: I agree with that. But if we find out that the river is not in quasi equilibrium or there's some seasonality aspect to it or some other aspect, do we reopen the methods and sit back at this table here in this meeting and reconvene a year later, or do we need to address this now?

GEORGE WALDOW: I'm going to give you my opinion, and that is that if we -- if we detect

an apparent difference, then we need to look at would that -- would that change be there absent the existence of this Project. And that's where the value of this effective discharge analysis comes in because we can simulate the same information without the Project diversion, without the Project hydrocycling, and that's how we detect, you know, a worst-case scenario with or without the Project.

And if there's no difference, then, again, I would say whatever changes are happening in the river can't be allocated against this Project.

JEFF RUNGE: I agree with you, and that's -- I think what I was getting at earlier is that this objective here is already being encompassed by -- already being addressed by other objectives, and so there's no new methods associated with this objective.

STEPHANIE WHITE: Are you suggesting that we eliminate Objective 5?

JEFF RUNGE: Yes, I do. I believe that it is being addressed under other objectives.

STEPHANIE WHITE: David?

DAVID TURNER: I guess I don't -- I don't know that you actually directly answered Jeff's question about revisiting the issues

depending on the results, at least as I heard the question posed.

And I guess what you were getting at is if we do detect an effect of the Project, is there something more that needs to be analyzed, is that not what you were asking?

JEFF RUNGE: I think he did answer my question because if there is a difference in channel gradation, that they can quantify those differences through their channel width and depth analysis through the effective discharge work.

And so I do believe that you can quantify the differences once you are able to identify the differences in gradation -- or trends in gradation, if they are, in fact, in place.

DAVID TURNER: I guess what I was thinking is if there was an effect, is there something more you were looking for, a next step, so to speak? And if there is a next step, I think we need to hash out that here. But if you're comfortable with it, I am.

RICHARD HOLLAND: I'd have to disagree with Jeff in the sense that I think this objective should stay. I do agree that the methodologies being used, the analysis being used

are used for other purposes in there, but I think the analysis specific to the pallid sturgeon habitat is relevant and needed. It's not going to add tremendous impact in terms of time to analyze that because you're going to be doing a lot of these assessments just for sedimentation purposes anyway.

But I think it's important that the pallid stays in this mix and we have this objective as part of the study plan.

JEFF RUNGE: And I understand what Rick is getting at here, too, and there is differences in methods because there -- once you look at the changes in width and depth through the effective discharge analysis, you've got to then take that next step and translate these changes in channel morphology to changes in habitat. And I think that's where this method here -- by putting that additional method, I believe this objective should still be in place and with that ability to transition from effects to channel morphology to effects to changes in pallid sturgeon habitat.

But again, I do recognize that this is a nonissue if the channel trends don't show a specific trending -- trend.

STEPHANIE WHITE: Rick, I'll let

you -- nothing? Are we changing any of these objectives, these activities? I see a head shake from Rick. Let's see a quick vote of cards, and then let's come back and talk about this objective.

Go ahead, David.

DAVID TURNER: I guess I hate to complicate these issues, but Nick had been thinking about this and the issues that -- not only from the pallid sturgeon point of view, but some of the other issues raised in our scoping efforts, and that includes game fish species associated with the Platte and the Loup bypass reach.

So he asked me to convey his opinion that we need to modify tasks -- and I think this gets to Task 7 where what we were looking at in terms of pallid sturgeon, he thinks it needs to be expanded to look at game fish species. Considering some of the comments we received during scoping, we're going to have to look at that.

So he wanted to expand the list to include channel catfish and other game fish species, and then compare that known habitat uses by those species located in rivers with the channel morphology information.

We're proposing that those -- I guess

there's nine -- nine proposed sites that you guys were looking at in terms of your geomorphology and also seven USGS sites -- anyway -- two sites on the Loup bypass reach, two sites on the power canal, and five sites on the Platte --

PAT ENGELBERT: The seven sites, two on the Loup and the five on the Platte.

DAVID TURNER: Right.

PAT ENGELBERT: Because at the power canal, we wouldn't run those -- we wouldn't run those calculations on the canal itself, no. So those seven sites.

DAVID TURNER: So anyway, he thinks we need that to kind of get at some of those other issues that were raised during scoping, so just kind of expand this method to include some game fish species.

STEPHANIE WHITE: And so I captured that, expand to include other game fish. Is that the only tweak to the activities?

DAVID TURNER: Right.

STEPHANIE WHITE: Discussion on that?

GEORGE WALDOW: I couldn't hear all what you said. I guess I'm not sure I understand what you're asking for. Are you asking that this

analysis be conducted for the reach upstream of the --

DAVID TURNER: Just to expand this to include game fish species as opposed to just the pallid sturgeon. Because, I mean, some of the issues that we're having to look at is, you know, what is the effect on the species compositions, game fish issues of the bypass reach, as well as in the lower Loup and the lower Platte below the canal.

So to look at that, are there species -- I think Nick's thing about this is is there a difference in those habitat characteristics and fish species compositions associated below the Project, above the Project and in the bypass reach.

JOHN SHADLE: David, when you say No. 7, you're talking about the fish passage issue, then? I'm trying to get caught up here.

STEPHANIE WHITE: Objective 7 or Task 7?

PAT ENGELBERT: Task 7 in the proposed study plan on Page 1-11.

STEPHANIE WHITE: What slide?

DAVID TURNER: It's not directly correlated to a slide, I don't think, but it seems to fit -- it fits this Task 7, I think.

QUINN DAMGAARD: David, if I could, I think during the last meeting, Nick was speaking, I think, more so than the sediment study that we're talking to, the flow diversion study. And actually, under that study, which we haven't spoken to yet, we do have an objective. It's Objective 6 of Study 5, to determine the relative significance of the Loup River bypass reach to the overall Loup fishery.

If I recall, Nick was kind of speaking to the bypass more than the Platte. But we do have a task under that study to use existing data, which is new to us, Game and Parks provided it. They did do some sampling in the late '90s upstream and downstream of the diversion on the Loup.

And so our task is really to look at that and to make a determination of the Project diversion effect on the fisheries upstream of the diversion. If I recall what Nick said during the 21st, I think that was the crux of what he was getting at.

DAVID TURNER: You might be right. I'm just looking at his memo to me, and he was talking about sedimentation studies. So I'll have to get back to him and see.

QUINN DAMGAARD: Okay. I think one of your specific comments in SD-2 was in our fish

passage study, which we'll also speak to. We kind of specified that for channel catfish, and it's our understanding that when you look at something like that, you do choose a specific fish species and mold it that way. But we'll talk about this later as well. We can expand that to look at all game fish, as Nick mentioned on the 21st.

DAVID TURNER: I guess the main thing is, based on the existing information, if you have new information, we'd kind of like to see it too when you've got it in hand, to know what we're talking about. Because when Nick looked back at what was known, it was very dated. So you know, as you get that information, if you could give -- put that on the record or something so we can take a look at it too, it may make some of this go away, or some of his concerns go away.

QUINN DAMGAARD: Yeah. I think Rich authored it, so he can pass it right on to you.

RICHARD HOLLAND: You can't call me Rich until you give me money, I keep telling you that.

STEPHANIE WHITE: I caught two action items in there that I just wanted to make note of. We need to share that data with FERC, and then I

think we need to confirm with Nick that his concerns have been taken care of. And if not, this becomes something we need to talk about in sedimentation. Does that capture it?

DAVID TURNER: Yeah, I think so. We'll have to take a look at it, and we'll get some comments back to you, or if I've inappropriately characterized what he was thinking.

STEPHANIE WHITE: Okay. So I'd like to take a quick vote on the objectives as they stand, understanding that we're going to do a couple of things with regard to other game fish. And if that needs to be included, then we'll discuss that.

So let's vote on this without this activity but with these understandings. So we'll take a quick show of cards. Green, you're fine with it as is; yellow, you still have some outstanding concerns; red, it's a show stopper for you.

Okay. We see greens. We will -- these are the activities for objective No. 5 in Sedimentation.

Now I want to go back and open up the objective itself for some discussion. It may be that we, again, won't be able to reach consensus. But just in the off chance that we can after we've

all had some time to sleep on it, I'd like to discuss that.

So Lisa, will you take a minute and reintroduce the discussion on this Objective No. 5 to the group, and then take it from there?

LISA RICHARDSON: At our last meeting when we discussed this objective, there was discussions about expanding the evaluation for the pallid to above the confluence of the Elkhorn. And the District's position on that -- we understand that the Game and Parks -- there have been a couple of recent pallid captures above the Elkhorn; however, we feel that the body of knowledge that exists shouldn't be thrown out based on the catch of a couple fish.

The body of information indicates that the reach of the pallid is from the Elkhorn on down. We should stick with that until there's more research that confirms there's any reason to change that.

STEPHANIE WHITE: Rick?

RICHARD HOLLAND: Since I brought -- since I brought that up, I'll address it.

The way you phrase that, your last statement, I would essentially say that what I did was expand the body of knowledge of where the

presence of pallids were. The only reason the Elkhorn was determined below is because that's where people have sampled and caught them to date for the last publication of the pallid sturgeon work that was being done.

As we have done more pallid sturgeon -- or sturgeon work, we've expanded where they're -- they've been found, and so I just brought that to the attention of the group and suggested that yes, they are using areas above the Elkhorn River.

So to answer your statement with a statement of my own, it's just trying to be exacting in terms of the availability of knowledge and distribution of the species within the system.

STEPHANIE WHITE: Go ahead.

JEFF RUNGE: Just echoing what Rick had said, nobody has ever went upstream of the Elkhorn, and so it's difficult to say if this one sighting is a rare observation, atypical of the species, or if this is just an artifact of sampling in that upstream reach. And we don't know that, but we do know that this is a multi-year study, so we will get more information as additional work is done.

And in regards to that, I see little

additional effort, what it takes to evaluate habitat upstream in the Elkhorn. The work is already going to be done. That work is already going to be processed for areas downstream. You've got -- you just have to replicate those same methods for the same effective discharge work in those areas upstream.

And so I guess for now, let's just work in that direction until subsequent survey information helps to identify whether or not this is an aberration or an artifact of sampling.

LISA RICHARDSON: I guess, Jeff, our position is still that this is one -- one time. And the other body of work, however many years this sampling was or wasn't done, we need to know what is the majority of information, not just one new piece of information. So I guess maybe this is one that we just have to agree to disagree as we move forward.

JEFF RUNGE: I guess is there an agreement, then, if additional sampling in subsequent years would identify more pallid in there, would there be a change in the methods to allow for this work?

LISA RICHARDSON: I guess that's

something we have to evaluate as information is available. I can't say one way or the other right now. I don't know what information might become available. Obviously, when new information and -- new information becomes available, then there's an opportunity to see if there's a reason to do anything different.

RICHARD HOLLAND: Well, come December when the end of the federal aid segment is and we have their performance report that documents the sampling of the pallids above the Elkhorn, then we'll submit that to FERC and you guys so that you have an official report. But right now, we're just getting it straight off the data sheet, so to speak.

I'm not trying to make a major case of this. I think it's just important to understand that the reason the Elkhorn -- I mean, it's nice because it's a confluence of a major river system coming into the Platte and all the data and collections of the pallids -- the few pallids that were down there that were done by the Pallid Sturgeon Task Force sampling essentially were below that stretch, so it was logical to use that as a dividing line in the river and say, Well, that's the way it is. People cling onto that quite readily

because -- for many reasons we won't have to get into here.

It's important to understand that as science moves forward and monitoring the species moves forward, you know, we're doing to have to adapt to what the data tells us. So that's really the reason we're setting this forward, to be aware that the pallid will use areas above the Elkhorn, and we're going to have to -- in terms of management of the species, we're going to have to deal with that fact. Whether it's an aberration or not, I'm not willing to say based on one individual, but it's important to understand that it's there.

STEPHANIE WHITE: Bob, you're next, and then John Shadle, we'll come back to yours.

ROBERT HARMS: The question that I have is how far have shovelnose sturgeon been found upstream? You've found them below the diversion?

DAVE TUNINK: Below the diversion.

RICHARD HOLLAND: Yeah.

JEFF RUNGE: Based on the NAWQA sampling done by USGS, I believe they found shovelnose sturgeon all the way up to Grand Island, or thereabouts.

ROBERT HARMS: Wasn't there a lake

sturgeon that was found --

JEFF RUNGE: Right.

ROBERT HARMS: Where was that found at?

DAVE TUNINK: Below the diversion, that area.

(Inaudible side discussion.)

RICHARD HOLLAND: We're just -- the methodologies for collecting pallids is improving as more people sample for them. With the efforts associated with the Missouri River population, the Mississippi population and the Platte population, we're starting to sample in a way that is more effective in collecting the species.

Based on that, as the science improves, as the monitoring continues, there's no reason to believe that we won't be more and more effective at capturing them wherever they are, whether they're going to go all the way up to North Platte, I have no idea, but we'll find that out. There may be species differences that restrict them to lower in the river; there may not. Frankly, that's why we're -- we have that study continuing, to find out more and more about these species.

ROBERT HARMS: Well, for the purposes

of this, what would your recommendation be for how far up above the Elkhorn, given your expertise, the presence of shovelnose up there to the Tailrace, lake sturgeon found?

RICHARD HOLLAND: Well, I don't think it's an added -- in terms of this objective, I don't think it's that much of an added burden on the analysis to do it at all the sites that you've got your hydraulic data for.

So I mean, that's -- I would just do it as part of the analysis that we would for anything else in the study, all the way up to the study reach. And if we can show that there's no impact or no change in the -- with the analysis, then that pretty much answers the question right there.

ROBERT HARMS: Well, Fish and Wildlife Service would concur with that, given what we know.

STEPHANIE WHITE: John?

JOHN SHADLE: I guess I'm aware of some studies, Rick, that we have, master's thesis or whatever or not, we have studied all the way up to the confluence where the Loup canal comes in. And now that we are sampling, we're finding them.

With regard to Ed Peters' study, the

reason why he concentrated below the Elkhorn River is because that's where we found the fish, and that's where he focused his efforts. He found that the other areas weren't producing as such.

So I'll just maybe clarify those two points, that we have studied the river or whatever or not. There's no question as to if we continue to stock pallid sturgeon in the Missouri River, with the numbers we have, the fish are going to find their way up the tribs or whatever else. That doesn't mean it's pallid sturgeon habitat simply because we've sampled the fish above.

Again, I'll bring everybody back to the point. You know, we've got a hydro system on the Loup River, and now we're going to try to figure out what impacts that has on sturgeon and sturgeon habitat and just define that.

STEPHANIE WHITE: George?

GEORGE WALDOW: I'm -- I appreciate what John said, and I think that he's kind of summarized our view of this issue. Finding of a few individuals does not affect the habitat. And I would refer back to our discussion regarding whooping cranes. Yes, they've been sighted on the Loup River, but that does not mean that the Loup

Project is considered whooping crane habitat.

And the concern, I think, the District has here is that -- and I'm -- this is my personal opinion, I did not hear this from anybody there -- but it's kind of a slippery slope. If we start -- every time a fish is discovered, a lonely fish is captured, then that brings the whole -- we'll call it the endangered species baggage, upstream and further upstream, which is problematic to an agency that's trying to license a project.

Because at this point in time or prior to these two recent captures, the -- the sturgeon issue was somewhat at arm's length from the Project. And of course, that's to the District's advantage, and it's not necessarily to anyone's disadvantage, even the fish.

But I think the concern is here that by acknowledging that if a -- if a fish is captured at Columbus next year or later this year and now all of a sudden the type of study -- this stage change study that's being done on behalf of the Central Platte Project be done in the lower Platte below the Elkhorn, I think the District fear is that they can somehow be required to do a similar study below Columbus now.

And for that to happen, there has to be real justification that that is truly pallid sturgeon habitat. And at this point, we think it's -- it may some day be determined that it is being used for spawning or other purposes by those fish, but simply because there's an individual or two that wanders upstream -- you know, it happened to be a pretty high flow year last year -- should not be automatically used to extend this habitat miles and miles and miles upstream.

So that's a -- that's just a comment. I'm not asking you to change your opinion, Rick, or anything, but that's -- that's kind of the position that we see from the relicensing standpoint. It has nothing to do with the fish or the habitat itself.

STEPHANIE WHITE: Jeff's been waiting.

JEFF RUNGE: I guess I would like to move on. We'll submit our comments to FERC and provide the rationale and let FERC have the discretion as to whether or not evaluations upstream of the Elkhorn is critical.

RICHARD HOLLAND: That's fine.

STEPHANIE WHITE: Okay. Let's do that. So the asterisk stays on this objective.

The activities have been accepted for the objective as is. If the objective changes, associated activities will change as well. And we do have two action items for a potential new activity, just in summary.

I've learned a couple of things about these microphones I want to share with you. One, you'll note, for those of you that have them in front of you, you can see the number of bars, just like your cell phone. They work best if they have a full set of bars, if all three bars are showing. So if you're working with a microphone that tends to trend the other way, I'll switch out the battery. I'm trying to stay on top of that.

I've also noticed that they work best if you leave them on. There's a little bit of lag time when you turn that microphone on. Sometimes we'll lose the first few seconds of what you're saying if you turn the microphone off. So I'd ask that you leave them on and help me make sure they've got a full set of bars.

All right. Let's move beyond sedimentation. I think our next one -- we need to go back to Study 5, is that right --

LISA RICHARDSON: Yes.

STEPHANIE WHITE: -- from yesterday's agenda? Let me move this back.

So Kim, we're on Slide 17 now. We've moved back. We skipped this one yesterday afternoon, so you'll catch it right now.

These are the goals -- I'm sorry, Kim, did you have something to say?

KIM NGUYEN: (Inaudible.)

STEPHANIE WHITE: Okay. Great.

Okay. The goals, as they were agreed to last time, are as follows: Determine if Project operations result in flow depletion on the lower Platte River and to what extent the magnitude, frequency, duration and timing of flows affect the Loup River bypass reach.

Goal No. 2: The results will be used to determine if the Project operations relative to flow depletion and flow diversion adversely affect the habitat used by interior least tern and piping plover populations, the fisheries, and the riverine habitat in the Loup River bypass reach and the lower Platte River.

So I've shared these with you today, just to give you a sense of how all these objectives fit in. I'll walk over there and flip the flip chart so

that these goals will be available for your reference. You can also continue to refer to your own Slide 17 in your handout.

Let's look at the associated activities with Objective 2. Again, this is an objective that this group reached consensus on last time.

Objective 1 is, To determine the net consumptive losses associated with Project operations compared to alternative conditions.

Now, the activities to discuss today are as follows: Collect gage and atmospheric data, as the first; the second is, Calculate net consumptive use for the Loup Power Canal system and the Loup River bypass reach, including evaporation and evapotranspiration, ET.

Give me one second to change these flip charts, and then we'll open it up to conversation.

Okay. Let's talk about this, or if there's no discussion, we can take a vote to accept these as is.

RICHARD HOLLAND: The return of the water to the bypass reach as a function of the dredge -- the dredging operation, how much is that, just out of curiosity? Is that a -- when they pump the sand off to the sides and a certain amount of

that water goes back into the river below it, how much is that? Do we know how much that is, roughly?

PAT ENGELBERT: Ron, would you say it's 50 CFS, 25 CFS, something like that?

RON ZIOLA: If it's just a pipe full of water, normally it's around 60 CFS. And when we're on the south side, all 60 CFS goes back to the river. When we're on the north side, it splits, depending on which end of the pile you're on.

If you're on the west half of the pile, it almost all goes back to the river just above the intake, so it's kind of cycling around. When we're on the east half of the pile, it will go north and then it will go east and it will come in just below the diversion. So that water is either cycling -- when it's going to the north, it's either cycling on the west end, or it's going back to the canal and back into the Platte.

NEAL SUESS: Yeah, Rick. In that case, it will just be back in the canal as part of the regular flow of the canal at that point, on the east end.

RICHARD HOLLAND: But a maximum pipe full would be 80 CFS?

RON ZIOLA: Max.

NEAL SUESS: Max, yeah.

RICHARD HOLLAND: I understand.

RON ZIOLA: But let's say they're sitting there cycling, that might be an hour every two or three days, otherwise it's about 60.

RICHARD HOLLAND: I'm not sure where I'm going with that, but it's just something I've been wondering for -- sorry.

RON ZIOLA: That's all right. Maximum would be 80; normally 60.

RICHARD HOLLAND: I gave you an easy question for once.

PAT ENGELBERT: I don't have a red card.

STEPHANIE WHITE: Other questions or comments?

GEORGE WALDOW: I would mention, Rick, that the water that does recycle on the south side dredging does get measured at the Genoa gage, so it's included in the record.

JEFF RUNGE: I'm not sure if this is addressed -- addressed later, but one of -- this objective here looks at net consumptive losses, but is there also some aspect of developing a hydrograph that would be applied to scenario alternatives,

action alternatives? And if so, does this also include -- or can this include reasonably foreseeable actions that would occur in the future that would affect hydrology?

PAT ENGELBERT: The intent of this objective is to look at what are the consumptive losses associated with Project conditions versus an alternative condition or alternative flow condition. For example, how much evaporation do we have through the canal system and the regulating reservoirs, and how much ET is there associated with those flows.

Concurrently, what is the evap and ET associated with the bypass reach during normal Project operations. And then that would allow us to -- if we were to look at different flow conditions, how would that -- net consumptive losses associated with those two functions increase or decrease? So that is the intent of this objective.

RICHARD HOLLAND: Is seepage a part of that? Seepage losses, would that be considered?

PAT ENGELBERT: We're only looking at losses from the system, in that seepage would eventually find its way back into the river.

STEPHANIE WHITE: All right. Jeff?

JEFF RUNGE: And I guess when we're

making this evaluation across alternatives, it's not the historic hydrology but the reasonably foreseeable hydrology that is likely to occur within a 30-year license period.

And so, you know, I think we mentioned before there are changes in the hydrograph associated with the program that are -- the Platte River Recovery Implementation Program, there's changes in the hydrograph that's reasonably foreseeable that's been quantified by DNR in their fully appropriated basin reports. And so I guess I would like to see that addressed too when developing a hydrograph that could be applied to represent that 30-year period.

LISA RICHARDSON: Jeff, I think the idea of flows is -- is discussed or evaluated on your Objective No. 3 --

JEFF RUNGE: Okay.

LISA RICHARDSON: -- evaluating historic flow trends on the Loup and Platte Rivers since Project inception. As Pat said, this is specific to consumptive losses.

JEFF RUNGE: Oh, that's great. I guess I got ahead of everybody else there. And if it is addressed later, I'll just save my comments

until then.

STEPHANIE WHITE: Okay. Are there any changes, additions, deletions that need to happen to the activities associated with Objective 1?

Okay. Let's just, for the record, take a quick show of cards. Green, we accept these as is; yellow, we still have some concerns; red, these are show stoppers.

Okay. We have achieved some green consensus on the activities associated with Objective No. 1.

Let's move into Objective No. 2: To use current and historic USGS gage rating curves to evaluate change in stage in the Loup River bypass reach during Project operations and compare against alternative hydrographs. This is an objective that we did reach consensus on last time.

The associated activities to discuss today are twofold: Create flow duration and flood frequency curves based on USGS gages; quantify the stage in the Loup River bypass reach at Genoa and Columbus.

So let's have some discussion on those two activities. Looks like, Jeff, you're getting ready

to go first.

JEFF RUNGE: First of all, I mentioned this limitation yesterday in regards to using transects by stream gages. And I know that the effective discharge calculations will look at transects, will look at cross sections outside of those in stream gages.

Right now it doesn't identify that this will look at areas outside of these narrow -- these bridge segments, which are usually narrower and more confined of a bed compared to other reaches of the river.

PAT ENGELBERT: Was that a question or a statement?

JEFF RUNGE: That's a question, is there currently within the methods an ability to look outside of the stream gage?

PAT ENGELBERT: No. We will utilize current USGS stream gages to look at a relative change in stage if there's a change in flow conditions.

JEFF RUNGE: Since -- as I identified earlier, these areas by these bridges are usually narrower, deeper, and constructed to be that way because you're building a bridge across it. I guess

if you have a -- a representative stage -- or change in stage at the bridge site, how do you correlate that to these wider, broader systems away from the bridges?

GARY LEWIS: I'd like -- I would like to make a couple comments on that. The same question has always -- has come up over the years since the '70s when we started looking at the Central Platte.

I looked at the stream flow measurement records extensively at the Bridgeport office and in Lincoln. A lot of times those hydrographers, the people that go out and measure those stream flows, will walk a considerable distance upstream or downstream of the bridge taking those measurements.

And in some of the hearings where I've testified in the past and this question came up, I used only those stream flow measurements that were a considerable distance. And I looked at maps that showed where those were taken, and at least from the aerial photos, you couldn't distinguish that cross section from these cross sections away from the gages.

So first, I just want to make a point that that record contains stream flow measurements that

are not right at the bridge. The only time they measure the bridge is when the water is too deep to get down in it and wade across. They will always move away from the bridge, in large part, to take those stream flow measurements.

So that's an important point to make here. I don't think it's commonly know, but just look at the data. That data is available in summary form, or you can go back and literally pull them out and copy them.

On the impacts, though, of the Project, which diverts 0 to 3,500 CFS, in the range of flows that may be impacted by the narrowing of the channel due to the bridges, especially down in this part of the Platte where we're talking about a huge drainage area, I don't think that's a significant percentage of the kind of flows that occur down there and that -- you know, I can't sit here and say for sure, but I would think the flows of that range would probably not extend laterally out to the point that the bridge itself was impacting the flow itself. It may not be in touch with the water.

Now, whether that cross section is different than it would have been if the bridge wasn't there is a different question. But the data

we have available to us and that can be used here does allow us to, I think, mitigate that concern considerably, and we were successful in doing that in the past using discretion on which stream flow measurements we look at.

STEPHANIE WHITE: Lisa and then Frank, and if we'd like, we can -- Lisa --

LISA RICHARDSON: Nothing.

STEPHANIE WHITE: Okay. How about you, Frank?

FRANK ALBRECHT: I just may need a refresher on this one. I thought I had this one down.

But on that objective, when it says, Comparing against alternative hydrographs, does that mean just the gage that's the furthest upstream on the bypass reach, comparing that to the other gage data, those hydrographs, or comparing that one to if you weren't diverting and you were putting it all down the river, kind of modeling that, what the hydrograph would look like if you weren't diverting?

PAT ENGELBERT: It would be any differing flow conditions that would come out as part of the study and looking at alternative scenarios.

FRANK ALBRECHT: What do you mean on different flow conditions, on actual --

PAT ENGELBERT: Whatever those conditions that are set forth by FERC and any requests that you get, looking at differing -- different scenarios or alternatives.

FRANK ALBRECHT: Okay. Diverting different amounts, two-thirds as much -- okay. Okay. I follow. Thank you.

STEPHANIE WHITE: Jeff? And then we'll come to you, George.

JEFF RUNGE: When you take a measurement away from the bridge, I still don't have the level of comfort in knowing that that cross section is representative of that reach. And I would support what Gary is saying, too, in regards to channel morphology, but I guess my interest in stage is more towards the physical habitat and how that's applied to the fish community and not towards channel morphology.

And with that, too, the effects to the fish community is not necessarily one-dimensional, not really solely tied to the microscale -- the microhabitat scale. But there is some aspect of effects of flow towards mesohabitats, the aggregate

of these microhabitats in developing these meso-type habitats.

And right now, this only provides you a one-dimensional microhabitat scale view of stage to -- comparing stage to the fish community, and I would like to see something to be expanded to look more towards a two-dimensional way of assessing flow impacts to habitat.

STEPHANIE WHITE: So if we added an activity, what would it be?

JEFF RUNGE: To develop a two-dimensional hydrology model that would evaluate different action alternatives effects to fish, micro- and mesohabitat -- that would evaluate action alternatives effects to micro- and meso-, M-E-S-O, habitat.

STEPHANIE WHITE: Okay. This is what my shorthand says: Develop a two-dimensional hydro model to capture the effects to fish micro- and mesohabitat that would evaluate alternative conditions impacts.

JEFF RUNGE: Yes, except for meso is M-E-S-O.

STEPHANIE WHITE: Okay.

JEFF RUNGE: And this concept is not

a unique concept. This is actually being applied by HDR to the lower Platte River and the stage change study for pallid sturgeon. And so it would be developing similar methods and applying similar measures that are directly affected by the Project.

PAT ENGELBERT: Jeff, is it correct, we are utilizing this for a list of threatened and endangered species in the lower Platte River. In this particular instance in the Loup River bypass reach, we feel analyzing a change in stage using this particular gage data is more than sufficient to answer the question on how stage is changing the bypass reach relative to current and alternative conditions.

JEFF RUNGE: And again, too, I think this is a point where we can move on, we can agree to disagree, and we'll just submit our comments, provide our rationale and allow for FERC to interpret all opinions.

DAVID TURNER: That's true, we can do that, and we will be the arbitrator.

I just want to reiterate, I think we're going down a path that Nick also was interested in, and I'll just read to you, basically, in his memo to me what he wanted to convey. And I think it would

get at some of these kind of concerns and questions.

And basically, as I said, in order to address the issues that were identified in Scoping Document 2, he believes we need a quantitative assessment of fish species and fish habitat in the affected waterways, i.e., the Loup River upstream of the diversion, the bypass reach --

COURT REPORTER: I'm sorry, I can't hear you very well.

DAVID TURNER: Basically, just to kind of restate that, in his words, in order to address the issues we've identified in SD-2, at a minimum, we need a quantitative assessment of fish species and fish habitat in the affected waterways, basically the Loup River upstream of the diversion, the bypass reach, Lost Creek, and the Platte River downstream of the Tailrace.

And his specific recommendations were -- and it goes back, again, to the sedimentation issues -- was to include reach analysis of the Platte River downstream and proximate to the Tailrace Canal confluence, and a reach of the Loup River upstream and proximate to the diversion and intake.

And then to modify Task 7, which I said earlier, to expand the species list to include the game fish species, and then compare that to other regional species, basically to conduct that task and compare the known habitat uses by the species located in other rivers with the channel morphology information gathered from -- and he put here the nine proposed sites, and then as I mentioned yesterday, the additional site down below the Tailrace.

So I think we're getting at the same concerns that Jeff was talking about, or at least I think that's where Nick was going with this.

JEFF RUNGE: And I believe this work is not excessive, too, because this would incorporate areas that could be used to evaluate hydrocycling impacts. It evaluates dewatering. You can also integrate temperature at these sites.

And so I believe that what we're asking for is unified, is streamlined. And it is additional work, but it's -- these are not stand-alone projects, these are integrated projects that, when conducting this work out in the field, you'll be doing this work simultaneously to address all sorts of these study sections.

STEPHANIE WHITE: Dave?

DAVE TUNINK: I believe what we're discussing right now is covered under Objective 5.

STEPHANIE WHITE: Objective 5 is, To determine effects, if any, of consumptive use on fisheries and other habitat on the lower Platte River downstream of the Tailrace Canal.

PAT ENGELBERT: Is he saying Objective 5 under the No. 5 study plan?

STEPHANIE WHITE: Yes. You're talking about that?

DAVE TUNINK: Yes.

STEPHANIE WHITE: Yes. The question was, was he saying Objective 5 under No. 5 study plan, and the answer is yes.

Okay. Neal?

NEAL SUESS: I guess, David, one of the concerns I have is you mentioned Lost Creek. Why does all of a sudden Lost Creek come into play here? I mean, that seems a little bit out of the stretch, that we should be analyzing Lost Creek.

DAVID TURNER: I didn't mean to bring it up in the context of flow depletion, but there are issues associated with -- there are issues raised in terms of increased flows in Lost Creek, as

we understand them, that would explain -- that were raised and we've included in SD-2.

So we're going to have to look at how the Project influences Lost Creek habitat, and there's no information that we have to be able to characterize that habitat or what those effects are going to be or how to relate the Project's effects. Maybe there's nothing there, but there's nothing that's been described in terms of impact.

NEAL SUESS: And I'll get back to what Dave said. I think everything we're talking about is in Objectives 5 and 6 here, and I think we're really trying to expand these objectives. They're in there in 5 and 6, and our methodologies in 5 and 6 are very clear as to what we plan on doing with those.

I think we're trying to expand this objective here to go way beyond what we need to with the other objectives that we have in this particular study plan.

STEPHANIE WHITE: George?

GEORGE WALDOW: I would agree with Neal. As I recall, part of the reason -- part of the reason for this objective was to actually plot the flat rating curve that exists on these streams.

And by that, I mean we will see that there's very little change in stage as you increase flow in the ranges that the Project -- as Gary mentioned, in the zero to 3,500 CFS. So the river, it broadens, but it doesn't get deeper. And that's the point we're trying to graphically make in this step. And then that would be valuable information in looking at alternative scenarios.

And I don't think Jeff's concerns about accuracy of measurement in the bridge section really are germane to that -- to that issue here. It's an established stream gage that is monitored and recalibrated frequently. It has considerable value to use it rather than to establish other sections upstream that change with time, et cetera, and then you run into the risk of, Well, is that -- does that compare correctly with the long-term gage records, and so on.

STEPHANIE WHITE: Jeff?

JEFF RUNGE: I'm not ready to talk yet.

STEPHANIE WHITE: Oh, all right. Anybody else?

Are you ready?

JEFF RUNGE: Yes. What we're

proposing in regards to methods under No. 2, these methods are not addressed in Objectives 5 and 6, and so that's why we're bringing this up now, knowing how these methods would also apply to 5 and 6.

STEPHANIE WHITE: Here's what I'm going to propose to you. My code, if you haven't caught it, is to put a red asterisk on the things that the group has not yet reached consensus on yet today. I'm going to put a red asterisk on this, and then I'd like to move to Objective 3.

As we move through the rest of the objectives in Flow Depletion and Flow Diversion, it may be that we get back to this discussion. So I'm going to -- I won't call for a vote on activities under Objective 2, but we might revisit them.

Lisa has asked me when I would like to take a break. If there's a need for it in the group, this is probably a good time for it. Let's take a ten-minute break. In fact, we'll come back at a quarter after the hour.

(Short break taken - 10:03 a.m.)

(Meeting resumed - 10:22 a.m.)

STEPHANIE WHITE: Okay. We're going to start on Slide 20, Objective 3 of Flow Depletion

and Flow Diversion. This is an objective we did not reach consensus on last time: To evaluate historic flow trends on the Loup and Platte Rivers since Project inception.

We'll treat this just like with the earlier objective. We'd like to discuss these activities as they apply -- this activity as it applies to the objective as is. We'll reach some consensus on that, and then we'll come back and talk about what some of the dissension was on the objective itself.

So the associated activity for Objective 3 on Study 5, Flow Depletion and Flow Diversion, is as follows: Evaluate historic flows in Loup and Platte Rivers.

Any discussion on that activity as it is associated to the objective as is?

KIM NGUYEN: (Inaudible.)

STEPHANIE WHITE: Sure. Go ahead.

KIM NGUYEN: (Inaudible.)

STEPHANIE WHITE: Just a second, Kim, I'm going to speak on your behalf. So she saw a piece of information on a previous slide -- go ahead.

KIM NGUYEN: (Inaudible.)

STEPHANIE WHITE: Yes. Kim's question is about the asterisks, and the asterisks, Kim, you'll see on -- I think only three objectives -- and that -- two objectives -- and that asterisk indicates that the group has not reached consensus on that objective. All the other objectives that have been presented in the presentation are either brand-new or have reached consensus in this group.

Does that make sense, Kim? Are you there, Kim?

KIM NGUYEN: Yes, I got it. Thanks.

STEPHANIE WHITE: Okay. You're welcome.

Okay. Discussion? Ron?

RON ZIOLA: Ron Ziola.

Platte River, are we talking historic flows in the lower Platte, or would we start at the Duncan gage?

NEAL SUESS: Yeah, per the study plan, it would be the gages at the Loup River at Genoa and Columbus and then the USGS gages on the Platte River at Duncan and North Bend. So Ron, we were including the Duncan gage.

STEPHANIE WHITE: Questions,

comments? Dave told me before the break that we should just come in and vote on this because he thought it would pass pretty fast. And maybe -- because there's not any discussion, maybe we should do that.

Let's take a show of cards for this activity as it is associated with the objectives as it stands right now. Green, accept.

All right. We have a yellow from Jeff Runge's corner. Jeff, if you want to talk to us a little bit about your concerns.

JEFF RUNGE: Yeah. The concern is not just the historic flow trends, but also including the reasonably foreseeable effects to future hydrology.

STEPHANIE WHITE: We're voting on it as is. Red for the activity as it is associated to this objective?

JEFF RUNGE: No, it is red to the objective.

STEPHANIE WHITE: And we'll come back and talk about the objective after we talk about this activity with this objective.

LISA RICHARDSON: We agreed last time that this piece of the objective was acceptable.

There was a desire to add reasonably foreseeable -- there was a desire to add future flows, which we did not agree on.

We want to talk about this objective and this task related to that objective, and are we all clear on that, are we okay with that, and then we'll talk about that other piece, that future flows.

So the idea is what it stands now, if we may have another objective or more discussion, at least, on the future flow trends.

STEPHANIE WHITE: Does that change your vote?

JEFF RUNGE: Well, I guess that depends on if the reasonably foreseeable is a new objective, or if that will be a modification to this objective. If it's a modification to the current objective, I'll provide a red card; if it's a new objective, stand-alone objective, I'll provide a green card to this current No. 3.

LISA RICHARDSON: We'll go with the green card, then.

JEFF RUNGE: Okay.

STEPHANIE WHITE: So then based on that comment and Lisa's response -- so Jeff's concern is about the time period which will be

introduced as a new objective, if needed. This objective is, To evaluate historic flow trends on the Loup and Platte Rivers since Project inception. And the activity is: To evaluate historic flows in Loup and Platte Rivers.

We had consensus, then, on green cards. Now let's talk about a new objective.

So Lisa, I'll let you kick this discussion off -- or Jeff, I'll let you restate your position. So if we had a new objective, what would it say?

JEFF RUNGE: To develop a period of record that can be applied to evaluate different alternatives -- and I guess to back up a bit, develop a period of record for stream flow on the Loup and Platte Rivers --

STEPHANIE WHITE: Okay.

JEFF RUNGE: -- and then the methods, that would include the reasonably foreseeable impacts to hydrology. That would be a method, that would be separate from the objective.

STEPHANIE WHITE: Okay. Reasonably foreseeable impacts to hydrology?

JEFF RUNGE: I shouldn't say impacts. That's not an appropriate word. Reasonably foreseeable changes to hydrology.

STEPHANIE WHITE: Okay. And the objective is, To develop a period of record for stream flow on the Loup and Platte Rivers, with the activity, To include reasonably foreseeable changes to hydrology; is that right, Jeff?

JEFF RUNGE: Yes. But that period of record would be applied towards the different action alternatives.

STEPHANIE WHITE: Speak into your microphone, please.

JEFF RUNGE: That period of record would be applied towards the different action alternatives.

STEPHANIE WHITE: Got it.

Okay. Lisa?

LISA RICHARDSON: I'm sorry, I was having a side conversation, and I apologize.

STEPHANIE WHITE: Here's a new objective that's been proposed by Jeff Runge, Objective 3-B, we'll call it, because we just voted on 3-A.

3-B is, To develop a period of record for stream flow on the Loup and Platte Rivers. The objective would be, To apply reasonably foreseeable changes to hydrology to evaluate different

alternatives.

No one can read this but me.

Okay. Discussion on that? George?

GEORGE WALDOW: I'm not sure how you can develop a period of record for future occurrence. Can you explain further what you mean?

JEFF RUNGE: When you're going to be evaluating, for example, effective discharge, there's going to be a certain record that you would use -- that you would apply as inputs to compare across alternatives. I guess, how would you -- what would you use in that case?

MATT PILLARD: I think maybe I can explain what our approach would be. We understand that through the Project, in support of the NEPA document, that we do need to consider, you know, cumulative impacts on future reasonably foreseeable projects. And so obviously, that's an obligation that we have in support of the NEPA document.

So issues that the Project has an impact on, we would then look at those reasonably foreseeable projects that have similar impacts, you know, that are overlapping in nature.

So I would suggest that the reasonably foreseeable projects that we would use to add in

that cumulative effect in addition to our Project's effects would be those that, for example, would have likely already gone through Section 7 consultation. Those would be reasonably foreseeable projects that we could then apply in addition to our Project impacts.

So that's where we would bring in those documented effects of other projects, add those in addition to whatever impacts would be associated with the Project.

STEPHANIE WHITE: Other discussion?

JEFF RUNGE: I guess, Matt, your explanation there, I guess how different is that from what is being proposed here up on the board?

MATT PILLARD: I think the difference is that we would be modeling those other project impacts. We'd be taking what's been developed already through those reasonably foreseeable projects that those NEPA actions -- identifying the impacts that are -- that have been explained through those processes and adding those in addition to whatever our Project impacts are to see what the cumulative effect would be.

For example, if we were going to reduce flows by 5 percent, we would look at our reasonably

foreseeable projects that may be also reducing flows. If their project is reducing flows 5 percent, the cumulative reduction would be 10. It's an additive effect.

JEFF RUNGE: That may be done or could be done from a hydrology perspective. But if this period of record here is plugged into different action alternatives, for example, like the effective discharge calculations, how would you identify this 5 percent difference after the fact to measure such as channel width and depth?

GEORGE WALDOW: Let me -- if I may, Jeff, I didn't really answer your last question. I think it goes to the same thing.

This is -- this is purely flow depletion and flow diversion, not looking at effective discharge here. We're looking at the hydrographs.

And so I think the comparison that we're making, we would have a current hydrograph, and then any changes to that due to future projects that were defined and evaluated -- and as Matt says, under Section 7 -- to the extent that their effects can be superimposed on the existing Project effects, that would be translated into a change in the hydrograph. And again, it would look at whether it was a flow

depletion or change in flow diversion. So you would be comparing that future multiple project scenario to the current situation.

JEFF RUNGE: And I think this is a situation, too, that we can better formalize within our written comments.

But reasonably foreseeable changes in the hydrograph impacts Loup's operations all the way from the head gates all the way down to the Tailrace.

For example, the Department of Natural Resources predicts a reasonably foreseeable reduction in base flows due to the lag effect of ground water wells. That's less water that would be diverted into the Project in the reasonably foreseeable future, and then that would, in turn, affect the amount of water coming out, it would affect your effective discharge calculations, and it would affect all the other aspects, hydrocycling, bypass, all the other aspects associated with this hydrology.

And so I'm trying to -- maybe this isn't the appropriate place, but I'm trying to develop a reasonably foreseeable hydrograph that can be applied for all of these evaluations related to

hydrology.

STEPHANIE WHITE: Lisa?

LISA RICHARDSON: Jeff, I guess our -- we believe that the evaluation of any future flow depletions belongs in the cumulative effects analysis, which would occur at a later point in time. It's not something we're studying. We're studying the effects of the Project and identifying those.

Once we have those areas identified, then we look for those other reasonably foreseeable projects that Matt mentioned have already been through Section 7, and we look for you guys to provide input on what those projects and provide us with your biological opinion on the effects so that we can look at other areas geographically, whether those effects overlap to certain resources where we are affecting something and other projects are affecting something. And then we'll look at -- analyze how those work together.

JEFF RUNGE: Yeah. And this gets back to that initial question. I guess I'll go back to FERC and David here.

Are these studies, are these methods intended to be all-inclusive and including

cumulative effects, or is there some ability to follow up after the fact and to modify existing modeling and that information to address cumulative effects?

DAVID TURNER: I'm not sure I understand at what point you would want to modify. If -- you know, we're kind of dancing around a couple of different issues, and I think Matt and Lisa both characterized how we typically look at cumulative effects and -- in terms of that -- in terms of their synergistic effects on how the Project affects those resources.

So if we know of some actions that are occurring, then we should be identifying them now and including that in this analysis. I don't think we should speculate -- we shouldn't speculate too much on future things, but if during this period of time, as we develop the application, new things come to mind, new information comes to bear, we can reevaluate the studies.

But I -- this is the record that we would be basing our recommendations on. And when you talk about modifying that, if the studies raise new questions, then, you know -- that we didn't anticipate, then we'll have to deal with that as we

go through this.

But where I think you were going relative to what -- what Lisa and Matt have been talking about is trying to predict future conditions, which I'm not so sure is reasonable without seeing that data that you have talked about. I'm not familiar what the DNR's analysis or that data.

So I mean, how reasonable -- is that just speculation of changes and can you quantify that to be able to put it into the record and model it?

JEFF RUNGE: Yes. And I do support that we don't try to anticipate every aspect of impacting -- or excuse me, not impacts, changes to hydrology. But there are established documents that, either through modeling or some assessment, does quantify the reasonable changes to -- future changes to hydrology, and those would be the ones that we would like to incorporate within the hydrology aspect of the study. And those documents we can formalize within our letter and provide that to FERC.

STEPHANIE WHITE: Okay. Jeff, I've modified your activities. Quinn, do you have a comment?

QUINN DAMGAARD: I do. I think also,

you know, specific to the flow depletion study, I think we're also at this point speculating on cumulative effects on if the Project would result in a net consumptive loss. Now, when we analyze that -- analyzing that in the first objective of the study, if the Project does not result in a net consumptive loss compared to alternatives, there would be no cumulative effects study with regards to depletion.

STEPHANIE WHITE: Jeff?

JEFF RUNGE: Well, this is more reasonably foreseeable effects to the hydrology. And it's not just within the bypass reach, and it's not just associated with losses.

We've -- our Platte River Program, the EIS associated with that document -- or with that recovery program identifies changes to the hydrograph in the Central Platte, which would be realized in the lower Platte.

And these additions or modifications to flow would not be a detriment to Loup, actually it would benefit Loup. And that would be of benefit to Loup by having this reasonably foreseeable change as part of their hydrograph. But that's something that has been documented and published within a formal

document. And it's those types of information I feel would be appropriate to incorporate within the hydrology.

STEPHANIE WHITE: Okay. Here's what I'd like to do. I've modified -- George, do you have a comment?

GEORGE WALDOW: I do. Because this -- again, I go back to this being a flow depletion and flow diversion study. Additional flows coming down from the Central Platte, to me, are irrelevant for looking at flow depletion and flow diversion relative to the Project.

Yes, those flows, of course, accumulate to the lower Platte. But with respect to the Project's changes in flow depletion and flow diversion within the Loup River system, I don't see a connection there.

STEPHANIE WHITE: Last comment I'll take from you, Jeff.

JEFF RUNGE: It has to be incorporated somehow. There's got to be some unified period of record that can be applied to evaluate these -- these different action alternatives, such as effective discharge, such as aspects associated with the bypass.

You know, we'll just think about it internally within the Fish and Wildlife Service and develop the best approach as to how to forward that on.

STEPHANIE WHITE: Okay. Here's what I'd like to do. I think we have a good record of the conversation here. The proposed Objective 3-B under Flow Depletion and Flow Diversion proposed by Jeff Runge is as follows: To develop a period of record for the stream flow on the Loup and Platte Rivers.

Its activity is, To be applied to evaluate different alternatives with regard to reasonably foreseeable changes to hydrology, and I added, Jeff, using existing data. I'm going to put a red asterisk on this, put it on the wall, and we're going to move on to Objective No. 3.

Dave, I think you were wrong about this point.

All right. No. 3 -- No. 4: To determine the extent of interior least tern and piping plover nesting on the Loup River above and below the Diversion Weir. This is an objective we agreed on last time.

Associated activities are five-fold. I'm

going to let you read through those, and then we'll come back for some discussion.

Kim, we're on slide 21.

LISA RICHARDSON: Matt, why don't you go through these.

MATT PILLARD: Yeah, I can go through these activities and provide a little more description of what's going to happen under each bullet.

We do have some nest count data for the Loup River upstream and downstream of the diversion. We'll look at the data that we have and determine, with the data that's there, if there are -- if we can identify any significant differences in bird data above and below the Diversion Weir.

Depending on if there is enough data to do that and if there is a significant differences, I -- if there is a significant difference, we would then look at this approach we touched on yesterday of looking at some aerial imagery to try to determine what is the differences in habitat above and below the Diversion Weir.

We would select some -- five years of aerial photography. And we have not identified those years yet, but we would select the years that

are either normal years for precipitation, or at a minimum, equal number of wet years and dry years so we can get a representative sample of aerials. We would select those aerials for a distance of 5 miles above and 5 miles below the Diversion Weir as our study area.

We would then use methodologies to analyze a couple of factors. The Kirsch study in 1996 is what we preliminarily selected as the way we would do that.

And then we would look at four things. We would try to identify channel widths, unvegetated sandbars, vegetated sandbars, and depict isolated and non-isolated ones, and presence and type of bank vegetation.

We would then, given that data, plot where the -- the nest information that we have onto those slides. Now, that's where in selecting the 5 miles we need to -- we don't have the plot data of where those birds are. The 5 miles up and down may not be applicable, we may need to change that study area.

So what we'd really like to do is plot where the birds have nested and use the aerials in those locations to be able to identify what kind of

habitats were they using when they nested.

We would then review habitat requirements that have been documented in other reports and get -- if there is new definitions of habitat or definitions of habitat that exist for the Loup River, we would sure use those if those are -- if those exist. We would use the best available information we have to identify what the habitat requirements are.

We would then compare the conditions of where those birds have nested to those habitat requirements and then look at what are the flows that were occurring in those periods of time to determine, you know, was the habitat present, what were the flows when they were there, to get an idea of what's different between the birds nesting above and below the Diversion Weir.

So that's a summary of the activities associated with this objective.

STEPHANIE WHITE: Questions, discussion? I have one from Mary. Anybody else? Mary, you're first.

MARY BOMBERGER BROWN: Okay. I have two things I would -- issues I would like to raise.

I'd like to make this -- the associated

activities parallel to the ones that we did yesterday, nest counts, and then also include a measure of productivity to match the recovery plans. And I would like to offer us -- we are doing much of this sort of data collection even now, and I would like to offer us and our services, that we could -- this is what we do. And so with some additional support, we would certainly be willing to do current -- provide more current data collection and information on this point, if that -- you folks would be receptive to that.

MATT PILLARD: Thanks, Mary. How would we use productivity? What -- the intent is to plot where the birds are nesting and relate that to what the habitat is. How would we use productivity in that sense?

MARY BOMBERGER BROWN: Well, there's -- if there's appropriate -- if there's adequate habitat suitable for birds to put nests on, then it's not necessarily --

COURT REPORTER: I'm sorry --

MATT PILLARD: You need a different mike.

MARY BOMBERGER BROWN: The habitat -- in order to be successful, to actually produce --

for the nest to be useful, the habitat has to remain throughout the nesting season. So the presence of nests and nest counts offers a snapshot, but we almost need a -- we need a series of snapshots. It needs to -- the habitat needs to be maintained from the point of nest initiation to fledging.

So yes, you're right, the nest counts are usable. But if we don't have a measure of productivity, the animals that are nesting on the Project property or in areas affected by the Project, those animals aren't contributing to the recovery, is why I would think that productivity measures would be useful, some measure of productivity.

Now, whether that's number of fledglings per adult pair or evidence of productivity or what the specific metric would be, we need to think about that, but some evidence that the nests that are on Project property persist to actually produce viable young.

LISA RICHARDSON: Is that data available, that productivity data available? Matt, I guess I thought -- we weren't aware of that data. We were aware of some adult counts, sighting counts and nesting information in the -- above and below

the diversion on the Loup. Is there more data?

MARY BOMBERGER BROWN: There's the data -- the estimates and counts of juveniles non -- nonfledged, nonflying young, so yes. So there is evidence of productivity data.

LISA RICHARDSON: In this specific reach?

MARY BOMBERGER BROWN: Yes.

LISA RICHARDSON: Okay. I guess we need to get that data from you then because we have not gotten that yet.

MARY BOMBERGER BROWN: Okay.

STEPHANIE WHITE: So go ahead, Jeff.

JEFF RUNGE: This is a great idea, and I fully support this work here. Just a few modifications.

One is I would like to see these study sites go beyond the 5 miles upstream and downstream, especially upstream, knowing that the diversion itself will back up water, and that will have some effect to habitats. I have no idea to what extent of -- to what percentage or portion of that 5 miles would be affected, but knowing that there is some effect.

And two, I would like to focus these study

sites in areas where there is a known history of consistent tern and plover nesting, and that area is in a bridge segment immediately upstream of the Fullerton bridge. And I think that would provide a more appropriate reference location.

Downstream of there, there are other areas that we can select for it in regards to a study area to the bypass reach, and I'm not sure if that necessarily has to -- to be within that 5-mile segment immediately downstream.

STEPHANIE WHITE: Did you just suggest that we add an activity to include a portion of the bypass reach?

JEFF RUNGE: That is a part of the current study. I'm just saying, don't limit yourself to 5 miles downstream of the diversion.

The other thing, too, is that it -- a lot of these indices that we're developing for the Platte River Program, habitat indices, are either flow related or three-dimensional, and those are things that you can't pull out of aerial photography, such as sandbar height above the reference flow, wetted width. You can pull wetted width out of aerial photography, but you can't extrapolate that towards wetted width at time

of nest initiation.

STEPHANIE WHITE: So is there an index we need to add?

JEFF RUNGE: Yes. It's that two-dimensional modeling component, which would be integrated and similar to that that I'm recommending for fish habitat.

STEPHANIE WHITE: Okay.

NEAL SUESS: Jeff, I have a question. You make a statement that we -- I'm curious as to where the backup from the Project comes. We don't have a dam. We don't have anything there. The water that comes into the Project just flows into the Project, there is no backup. I don't -- I've heard you say this a couple times, and I just -- it's not there.

There is no backup of water upstream of the diversion structure. It either comes into the canal or it goes downstream. There is no backup that goes backwards. There's no ponding, there's nothing there. So I -- I'm really struggling with that because we don't back water up.

JEFF RUNGE: You do have a -- you do have a gage, and those gates have a certain height to them and there is a minimum flow that's allowed

to be bypassed through that diversion and --

NEAL SUESS: No. They open from the bottom. So it either comes in or it flows past. There is no backup that goes back upstream. I think you don't -- I guess I'm not sure that you understand the way our operation works. We -- there is no backup. There's no -- nothing there that backs water up beyond the diversion.

It comes in and it goes either into our -- into our canal, or it goes downstream. There is no -- there is nothing back there that backs up. I don't -- I guess I'm really struggling with that.

STEPHANIE WHITE: I think there might be a comment in this corner. George, would you like to speak?

GEORGE WALDOW: The issue is here is a matter of degree. There's a weir -- an overflow weir, and it does create a minimum head so that water can be diverted. It doesn't qualify as a dam and it doesn't create a lake, and we can easily determine how far the effect goes upstream.

It's -- I'm trying to recall the slope of the Loup River there. It's fairly steep. And there are some -- I don't know if I want to trust them -- there were some county-wide flood studies done. But

it -- my estimate would be it wouldn't go upstream -- the effect of that weir wouldn't go upstream more than about a half mile.

So we're not talking up to the Cedar River or up to Fullerton. And my concern, though, is when you mentioned about the 2-D model concept and being upstream of the Fullerton bridge where the bird nesting is, this becomes a much more complex thing, to go -- be looking upstream from Genoa, and that -- that becomes problematic, in my mind.

JEFF RUNGE: I guess problematic as in? I guess I'm trying to understand how would this be problematic.

GEORGE WALDOW: To start modeling from the Genoa gage and to go upstream to try and define actual cross section depths and widths and channel criteria, that's a lot of miles.

JEFF RUNGE: And this wouldn't be -- this -- these areas would be selected study sites. And I'm not sure of the extent, but they would be of a localized area that is representative of that larger reach.

And I guess getting back to this original objective here as comparison of -- of areas on the Loup where there has been historic nesting, I guess

I'll retract that statement about the backing up of water. I guess I would simply want to look at areas where there is historic nesting on a consistent basis and evaluate those areas.

MATT PILLARD: And Jeff, I would concur that what we were trying to do is make sure we had similar river reaches and distance, that we didn't look 31 miles downstream and only 5 miles up, or -- we wanted to have similar study areas, and we do want to limit those to where we have known bird populations.

What we're trying to do is show what's different from the Project standpoint. We have birds upstream, what does that look like; we have birds downstream, what does it look like, how do they compare? And more specifically, how is the Project impacting that?

That's why we would look at what are the flows upstream where we have those birds, and what the flows downstream where we also have birds, and what is the difference.

So I think moving that study area to where we have populations makes sense. We'll still focus on a similar reach in terms of distance for those two areas. And for now, we'll stay with 5 miles,

unless I hear something more needs to be done. But that we make sure those 5 miles are the right 5 miles, that's the important piece.

And then relative to the 2-D modeling, I guess I can't -- I'm not sure if that's going to get us more than what -- get us more than what we are trying to show relative to what's -- what's different using the aerials from above and below. The 2-D modeling, I guess I don't have the expertise there to know.

You know, if the birds are there, then the right things must have been there for the birds to be there that year. We're not trying to model different scenarios, we're just trying to show historically what was there and what wasn't.

JEFF RUNGE: That's good when it comes to developing a baseline, but we're also looking at and evaluating different action alternatives and how these different action alternatives would affect suitability.

And I guess that's where that two-dimensional model would come into play, would be -- that model would be applied towards this alternative analysis.

DAVID TURNER: What was the reason

for limiting to the lower 5 miles? I can see trying to do it in reasonable proximity to the diversion. But you've got the bypass reach that's a lot longer. Why just the first 5 miles?

MATT PILLARD: It wouldn't need to be the first. I think we just decided it doesn't need to be the first 5 miles, but we would want to select 5 miles that would be representative of where we've had some known populations of birds. If we've never had any birds on pieces of it, then there's nothing to correlate what the birds are using.

GEORGE WALDOW: I think the difference between the upstream nesting locations and the downstream nesting locations with respect to the Project is different flows. And that's really what we're trying to get at, does the diversion water from the Loup River significantly make a difference in the ability of the birds to nest and to be productive, is where we're trying to go.

And I don't think it needs to get into the modeling of individual sandbars and wetted perimeters and all of those issues. We will -- as Matt indicated, we will use aerial photography, and if these sites are relatively -- can be accessed and observed, maybe closer observation is appropriate.

But again, this is private property and it's not readily accessible for studies.

But again, I don't think that there's any intention here to get into things like two-dimensional modeling or sandbar measurement above water level. Those things are what they are, and they have been what they have been. And if we need to do anything, it would be done with the effective discharge method.

GARY LEWIS: I want to add to this just a little bit. I'll try not to get too technical.

But there's a concern I have that a view that's held strongly is what's called singularity -- and let me just explain that very quickly -- that if you measure the cross section or you have one of these locations where the discharge is a certain amount and you measure the stage or width of the channel and everything else, that if you have a different discharge, you're studying, let's say, an alternative future, that you can take that data and use it in any way relevant to assess what the effect might be on water depths for that future change in flow.

In other words, the relationship between

all of those dimensions and the discharge rate is not singular. It's not a single value. That one discharge does not create that much habitat. The habitat is created by weeks, months, possibly years of prior flows that form that habitat. That's where the effective discharge is describing this.

The condition that would exist is based on the days and weeks and probably months and possibly years leading up to that point when you happen to be out there and see a depth at a certain point.

So creating these two-dimensional data sets and then using them in any way to say, If the flow is different, we have a different hydrology, I can take that same cross section and analyze what effect it will have on depth, you can't do that. You can only look at change in that flow for months leading up to that point and trying to assess what effect that might have on morphology and then make some reasonable decisions out of that.

So this is not a rigid bed stream. There is not a single relationship between that and discharge. That's why the USGS has to go out and measure it all the time, it's constantly changing. Even if they went to the same exact location and measured, it's different. And they have to adjust

their calculation of how much flow is occurring based on the geometry change that's occurred.

So it's constantly shifting -- they call it a shift -- and they're constantly keeping up. So these are facts, and I think there's a misunderstanding that these two-dimensional measurements or analysis can be used in some way to look at future conditions. I'd be very skeptical of that because you are disregarding the fact that it's not a singular system. It's nonsingular. That's the term that's used in the vernacular. Just a comment.

JEFF RUNGE: I do understand that, and I understand the limitations, especially with a two-year study to capture the variability of the channel. But I think what you raised was an interesting point there, when we talk about flow depletion, flow diversion, is there a method in place that looks at these cumulative month-, year-, decade-old changes to habitat?

I guess maybe that's an additional method that we can propose here because it seems as if that seems to be appropriate in quantifying areas upstream of the diversion versus areas downstream of the diversion.

GARY LEWIS: I'll take a shot at that.

No, there is no such technology, and that is a dilemma. We don't have the technology to state that a -- that sediment flow and sediment conditions creates a certain habitat condition. That's up to the biologists. It was there or it wasn't, and they used it or they didn't.

And what we're driving at here with effective discharge is that the Platte -- the lower Platte, especially, is a strongly braided system, longstanding, very little detected changes. If you look at studies of changes in the Platte, when you get down to North Bend, there's nothing. They just can't nail any particular changes down there.

So the ecology or the habitat is the morphology, and the morphology is the habitat. So it exists or it doesn't. The habitat exists or it doesn't over the years leading up to the present. It existed or it didn't, and that was based on the morphology. That's this set of braided channels and dissecting bars and constantly shifting things and sand reshaping itself. That's the dynamic morphology. That creates a habitat.

We just don't have any other way of saying

we can have a half a meter taller bars if we do such and so to the river. If that's what you're driving at, it doesn't exist. That technology is not out there in models or any other way. Even studies aren't going to tell you something in one or two years. It would take many years and a lot of dollars to understand that process.

STEPHANIE WHITE: Rick?

RICHARD HOLLAND: You just characterized exactly some of my thoughts, and I can -- that have perplexed us for all of our biological sampling in terms of the ability to characterize habitat mathematically and the problems with the sand bottom stream that's eroding.

You talk about the lack of perceived changes in -- in the lower Platte River and the physical changes the Platte has been documented to be, compared to the Central Platte and the middle Platte, or whatever John wants to call that part by his area. We won't get into that.

But the -- the perspective of us biologists when we're looking at these species is that they're using habitat out there but there's changes in the -- there's -- we perceive changes in the population dynamics of the species, and so we

look for causal factors.

And our -- our opinions that some of these species are in trouble in the lower Platte and the Central Platte are based on the fact that population numbers are declining based on our records. Productivity is declining in certain aspects of their biology, and so we're looking for causal factors and trying to relate that back to habitat.

So when you say there's no changes that are perceived, I understand what you're saying in terms of some of the physical attributes that we measure and the difficulties of measuring them, or at least characterizing them.

There has been some -- some examination of historical imagery along the Platte showing there is changes in terms of some movement of islands and buildup of vegetative islands and things in the lower Platte. Quantifying that gets difficult. We won't get into all the problems with using pictures to quantify the things that you can't necessarily get all the details on.

But from our perspective, from biologists, we're seeing changes based on what data we have in terms of the birds and maybe some of the fish, and so we're -- our concern has always been we can't

wait to have these species disappear before we say there's changes, so we're starting to draw the line in the sand, so to speak.

And so we would argue, from a biological standpoint, that there have been perceived changes in the lower Platte biology, and so how would we then connect it to the physical aspects? You know, that's where we have to go to you, Gary, and try to get to that expertise and figure out how we deal with that singularity problem, and it's tough, and it's expensive too. Very expensive. So that's why we came to Neal here to get all the money we could because he's got those deep pockets.

Anyway, I wanted to -- I've heard you make that statement a couple times, and I appreciate why you made that statement. I'm not disagreeing with it. It's a matter of how you analyze what information we have and the ability of the models to deal with these kinds of systems.

From a biologist's standpoint, though, I would change that just a bit and say we are seeing changes, and they're not necessarily in the right direction.

STEPHANIE WHITE: Before you respond, I want to make sure we're still talking about the

addition of the two-dimensional modeling component. Are we talking about adding that as an activity? And if so, does that need to change? I see some head shaking and some nods.

MATT PILLARD: I think what I tried to state earlier is that we can certainly change our activities relative to where our aerial imagery will be looking at -- we'll focus those 5 miles on where the birds are, both above and below.

At this time I'm not sure that a two-dimensional model is an activity that we'd be adding. If I understood what Jeff would do, they would summarize that and submit that to FERC. We -- it's not to say we won't go back and see what value that may be, but I'd sure be interested in seeing what you would have to say.

STEPHANIE WHITE: Okay. Mary?

MARY BOMBERGER BROWN: I'm -- I'm still vague on the 5-mile thing. Can you -- can we return to that question? That seems like a very proximate distance -- I talk with my hands -- a very proximate -- why 5 miles? I guess I'm still a little bit vague on why that distance was chosen. Is it one single 5 miles or is it a set of 5 miles or -- I'm still vague on that.

MATT PILLARD: Well, without seeing where the nesting plots are, which we only have numbers, we don't have locations, we had to categorize some distance to start with. I think if we have the plot data of where the birds are, we can then better synthesize how that might work from a methods standpoint. Because I doubt it's 5 consecutive miles where the -- or maybe all the birds are nesting in 1 mile. Without having that data, it's hard for us to know. That's why initially we selected -- you know, to limit us to something, we selected 5 miles. It needs to be the right 5 miles.

And -- if you have plot data, that would help us, I guess, work together to decide what would be best to look at from an aerial imagery perspective.

MARY BOMBERGER BROWN: Yeah, we'll need to resolve that issue of where our 5 miles are, or if it should be 5 miles.

MATT PILLARD: So the data would be the first place to start. I think we'll create a list of things that we need and we'll summarize that and work with you after this. You mentioned some productivity things, and this is kind of the second

piece that would be valuable for us.

LISA RICHARDSON: And I guess, Matt, we've already requested that plot data initially. We've requested GIS files, and there's just been some reluctance to provide that specific data. And I know you don't typically provide that location specific data, but without that data, it's hard for us to develop effective methodology.

MARY BOMBERGER BROWN: Just because of their listing status, it's tough for us -- there's difficulties with that to some degree. But yes, I know, but it's the case.

STEPHANIE WHITE: Jeff --

NEAL SUESS: No, I'm going to go next. Sorry about that.

And I guess this goes to everybody here. And Mary, I don't mean to pick on you here, but this goes to everybody. But you know, this is a two-way street. We're not here by ourselves. I mean, without the data and without the information, we can't give you guys what you want.

And if we ask for information and we don't get it, and yet you want more information, I mean, I take offense to that. I mean, we want your help. We've asked for your help. And if -- you know, for

whatever reason, if we can't get it from you, and you say -- but you need more from us, I don't know how you guys expect us to do this.

And you know, I've heard this a couple different times. You know, if we ask for data, that doesn't mean we want you to wait a year to give us the data, that means we want it now because that will help us in doing our studies. And I -- I say this because it just -- it seems that we go through this every once in a while, and we come down and say, Hey, we need the data. And you say, Well, did you know this data is out there? And if we ask for it, you know, we need it. It's not like we're trying to play a guessing game here.

And so, again, I don't mean to pick on anybody here, but again, this is a cooperation between all of us. I mean, that's what the integrated licensing process is all about, is to cooperate and get what we need. So again, if we need data and we ask for it, you know, I want to make sure that we can get that data.

STEPHANIE WHITE: If I might summarize where I think we are in this discussion, I have not heard much dissension about the associated activities on the screen. I have heard from Mary

that we add to this one just like we did yesterday, Objective 3 in the sedimentation study.

I have written it verbatim, that it parallels with the recovery plan as related to productivity, that is, number of fledglings per matched pair. And I have an action item that we'll get that data from you.

And I heard Matt talk about using that data to help focus our analysis to where there is a known historic nesting presence of interior least terns and piping plovers.

There has been some discussion on the use of a two-dimensional model. I have not heard that we have reached consensus on that. What I'd like to do is take a quick show of cards on the activities as they are listed, the addition of the parallel with the recovery plan with additional data and a focus of the sites. This two-dimensional model, I don't think we're going to reach consensus on today, so that's going to be left on the table.

I would like to take a vote on everything else, so let's see a show of cards.

I have a red from the District, greens from everybody else. Okay.

NEAL SUESS: I guess my biggest

concern -- and it comes back to everything that we've been doing here the last couple of days -- when we walked away from here in April, we had agreement here. I mean, there's no asterisks up on the board, with the exception of Mary's stuff, which I understand there's some different stuff, some new stuff that came up. Now we're throwing a whole bunch of new stuff up here.

And you know, if -- if we're -- I'm trying to be patient here, guys, but why do we agree to something in April and all of a sudden it's not any good anymore? And if you had it -- if you had a disagreement in April, you should have said it at that point in time.

We came here today and yesterday thinking we had agreement on a number of these things and to talk in more detail about it. And again, we haven't gotten into the methodology and, David, I understand your concern over methodology part of it.

But, again, you know, we've seen this -- and I have a little bit of an issue with going all the way up -- you know, we don't control stuff upstream of the diversion. I understand looking somewhat upstream of the diversion for what's going on up there, but again, we don't control any of the

water that comes in -- that's upstream of where -- the diversion out of the Headworks.

And to hold us responsible for something that happens that we don't have any control of seems to be -- and even study it, seems to be an unrealistic expectation of Loup Power District. That seems to be an unfair result of what happens.

I'll agree that there is fish and wildlife and things that happen upstream and that you have to look at that to some degree, but I guess I just really have a -- you know, how can we, then, at that point in time, if there's habitat upstream and for whatever reason, we can't really control what that habitat is upstream because we don't have any way to control that upstream.

And so that's kind of where my objection is at on all of this, you know. I can probably come close to getting to green if I can hear a little bit more about where this is at. But I guess that's where I'm coming from on a lot of this, and it seems to be a never-ending theme here that new -- you know, everybody wants to bring something new up that, again, I thought we had agreed to in April.

STEPHANIE WHITE: Let me actually make clarification as to a question, then I know

that Jeff and David will speak.

NEAL SUESS: Go ahead.

STEPHANIE WHITE: Just one clarification for you, Neal, that might help a little bit.

We did reach consensus on the objective, and that is actually not at discussion, we've not changed that at all. It's really the activities that I think are changing, and those are pieces we haven't discussed yet.

My question for you is, have I complicated it a little bit by leaving specific locations up here? If I take off the Fullerton and the --

NEAL SUESS: Yeah, I think that would definitely help me at that point in time.

STEPHANIE WHITE: Okay. So really what we're saying is -- so is it 5 miles, is it 4, whatever that is, what we have just said is we're willing to take a look at this new data and determine -- and focus our analysis to where there is a historic nesting presence or a known presence, if I'm paraphrasing correctly, and that's what we're talking about.

DAVID TURNER: I think you hit on exactly what I was going to make a point of. In the

April meetings, we reached consensus on the objectives, and now we're really talking about the methods and the analysis, which are where we need to go. And you're right, in the integrated licensing process, we need to reach agreement on that.

And it does behoove all of us to make that data available as soon as possible. They are being held to a time frame to get this done, and stalling or -- I shouldn't -- stalling isn't the right word, but not being as -- not being completely receptive or cognizant of those time frames is not going to aid this effort from their perspective or ours. So it behooves everybody to be as responsive as possible.

And with regards to the ESA data, I can understand some of that reluctance, but you can treat that -- there are ways to treat that in terms of not making it public and still using that data. So I would encourage you to make it available. We're going to need to see it too.

MARY BOMBERGER BROWN: It is available, it's just --

DAVID TURNER: From the perspective of looking upstream versus downstream, I think the way that I envision it and understand it is we have

to evaluate the effects of the Project, and the only real way of doing that sometimes is to use a comparative basis. And if you can look upstream -- immediately upstream before the Project ever has any influence and then look at the habitats where it does, at least that's the perspective I try to look at in terms of in trying to compare the changes that have resulted. So I think that's why we talk about moving things upstream --

NEAL SUESS: And I do understand that, David. And you use the word immediately upstream, and obviously everybody has a different opinion as to what is immediately upstream. And I guess that's just my only concern.

I mean, Fullerton, in my mind, is a long ways upstream of the Project. Immediately upstream is just maybe a mile, a half mile, whatever we're talking about. That I understand, you know, and I realize there's going to be discussion about all of that. As long as we keep that immediately upstream up in there -- and again, it's a matter of definition, depending upon what we find and where we're at -- we're okay -- I'm okay with that.

DAVID TURNER: I think one approach that we might consider looking at is where does the

hydrology change, because that's what we're really talking about in terms of the Project effects is changes to hydrology and sediment input.

I wouldn't look any further upstream to a point where that hydrology is changing dramatically in terms of inputs or otherwise. I mean, one approach that we've done in terms of looking at fish habitat is to apply what we call PHABSIM or IFIM analysis. And I think -- and I'm not a fisheries biologist here -- but they go to representative reaches where there's a -- there are changes and 10 percent of the hydrology is reflective of that change.

So if you're getting more input than, say, 10 percent of the available flow, then you've gotten into a reach that has more of an effect on the hydrology. So I would -- I would just be cognizant of that when we're looking at immediately upstream. That may be reasonable to use for something to define as to where are things going to change dramatically.

STEPHANIE WHITE: So I've modified what's here on the board. It's quite a mess, but here's what it really says. Like we did for Sedimentation, Objective 3, we will parallel with

the recovery plan as related to productivity, number of fledglings per matched pair, we'll get that data from Mary.

We'll use that to focus -- to have selected study sites that are focused on areas where there is a known presence or historic nesting activity. And I tried to capture what you said, it's really limited to -- I don't know that identical is the right word -- it's really limited to similar hydrology. Again, the two-dimensional model is excluded from the piece that we're about to reach consensus on.

Does that change your comfort level with this?

Okay. So the District has shown a green. I don't think you're changing, are you, Rick? All right. We've got greens.

Okay. So this -- I'm going to draw a little dash line. We will not forget about this, but we did not reach consensus on this today. We did reach consensus on these two additional activities as well as those on the screen for Objective 4. Jeff?

JEFF RUNGE: The objective is to determine the extent of interior least tern and

piper plover nesting on the Loup River above and below the Diversion Weir. This is the only objective, really, that looks at tern and plover nesting suitability within that bypass reach.

And right now, we -- the two-dimensional modeling is not on the table. And with that in mind, is -- what tool is in place that would evaluate different hydrologies associated with action alternatives and compare those differences in hydrology to tern and plover nesting suitability? What tools are in place?

STEPHANIE WHITE: I just first want to understand, have we closed the book on Objective 4?

JEFF RUNGE: Yes.

STEPHANIE WHITE: Okay. So I'm going to rip this off, and then we're going to move into Objective 5 at the conclusion of this.

Go ahead, Gary.

GARY LEWIS: Yeah, I think I'm repeating myself a little bit, but what will affect the habitat is what would affect the morphology, and that isn't a change in the annual hydrograph, that's a change in either the flow or sediment relationships such that morphology changes. So the

tool we have available -- and it still is very appropriate, I don't see any challenge yet to this tool -- is the effective discharge method.

So if we were interested in some alternative future with some different hydrology, then we can run that through, calculate the sediment transport, do the calculations that Pat went through yesterday, and look at the effective discharge change for a period of time leading up to some future, or for the first increment of some future, and see if it changes the effective discharge. So there would be an expected change in morphology, and by that, a change in habitat. I'm sorry we don't have a whole lot more to offer.

I did want to comment, I didn't get a chance to close at least my thoughts on the 2-D modeling. I object to it because I don't see it as useful in a nonsingular system. That's why I'm opposing it here. So I don't have a red card, but I don't think it should be on the list.

I think for the record, and for interest here, I talked to Jerry Kenny yesterday in a sidebar. Jerry is -- was my graduate student at Nebraska. I taught him pretty much what he knows in hydrology and hydraulics.

But I pulled him aside and asked him -- because this is a concern, this question of how do you look at habitat and then these big picture things like morphology and tie the two together, and what are they doing with the mega bucks they have in the program?

Some of you may know, I was a co-author of the steps in the first increment for the program, the Platte River Recovery Program. I worked with the MS team under contract with the cooperative agreement group that governs the council and developed that program.

Jerry said they're having a hard time implementing it because they have too aggressive of a schedule and too many things to do in that program. And I have a copy of that with me.

But I worked with that committee in developing those activities, and there was no action item in that list that addresses this very serious question of how do we evaluate effects of any of these projects on the habitat in regard to bars and channels and everything else.

I asked Jerry if there's been any change in that, are they going to throw a bunch of money into that. They have a geomorphology study going on

right now, and all it's going to look at, really, is the thalweg, and they'll survey it twice, and is it changing over the three-year -- first three years of the first increment. So they don't have a program to do that.

So the comment made earlier -- I asked Jerry, I said, Can you release some of those moneys down river? You know, is there a diversion or a dam somewhere stopping the flow of the bucks down the river? I think it would be an important study. But they can't afford to do it, and certainly the Loup can't afford to do this.

There may or may not be some value. It's so nonsingular. If you started measuring bars and dunes and so forth that form the habitat on Monday and got down the river 2 miles by taking transects, by then what you started with on Monday, by Wednesday it would have changed.

It's a dynamic system. I don't know how better to characterize it except with these effective discharge and morphology indicators. I'd be very interested in anybody having a better idea. That's what we have right now, so just a closing comment.

STEPHANIE WHITE: A set of honorary

cards for you.

GARY LEWIS: Oh, thank you.

STEPHANIE WHITE: And Jeff, I think you raised a question that may not be raised in our study plans or objectives or activities. And if that's the case, I'd like to get it on a piece of paper, we'll put it up on the wall, and then we'll talk about Objective 5.

JEFF RUNGE: I'd like to move on too. I believe this -- responses just can't be done by me singularly here at this place right now. This is something that we really need to --

STEPHANIE WHITE: Did you lose your mike?

JEFF RUNGE: Oh. This is something here that we really need to have a discussion with internally and to -- to query those that have had experiences in other river systems and see what they are doing, and then we'll come back with our proposal and rationale within our written response.

STEPHANIE WHITE: Okay. So I'm not going to put anything additional on table, and you're going to take that on.

JEFF RUNGE: Yes, yes.

STEPHANIE WHITE: Okay. Let's talk

about Objective 5. It is -- is it 11:30? We're going to get through Flow Depletion and Flow Diversion before lunchtime.

Objective 5, Determine Project effects, if any, of consumptive use on fisheries and other habitat on the lower Platte River downstream of the Tailrace Canal. This is an objective we agreed on as a group prior, previously.

Here are the associated activities, Similar to those we talked about for Objectives 1 and 2, and including the premise that depletions would directly correlate with effects, in parentheses, adverse or beneficial, to fisheries and riverine habitat.

It includes the following: Calculate net consumptive use for the Loup Power Canal System and the Loup River bypass reach and create flow duration and flood frequency curves based on USGS gages.

Let's have a discussion on those activities.

QUINN DAMGAARD: Stephanie, if I could just clarify this a little bit, the activities under this objective are essentially being accomplished by Objectives 1 and 2 that we've already talked to.

Basically, we're making the correlation that if the Project and the operations do not result in net consumptive use when compared to alternative conditions, then they would not have an adverse effect on fishery or riverine habitat, potentially even a beneficial effect as compared to the alternative conditions.

So there was some discussion previously with regards to fishery habitat, different types of surveys in that regard. That is not, I guess, on the table as of now under this -- under this activity or this objective.

STEPHANIE WHITE: Rick?

RICHARD HOLLAND: The -- the analysis of impact on fishery with the belated contribution of our data that we gave you in April, one of my main concerns is that the potential -- if there is an impact, the potential impact is going to be most apparent seasonally when the diversion kicks in and dewaters the bypass reach, that that impact on the fish populations in that bypass reach would probably be maximum at that period of time.

So I would hope there would be a seasonal component to your looking at that fisheries data, that -- at least take a look at from -- I think it's

broken down by month of sampling and things like that. So there may be some impact in terms of seasonal presence or absence or numbers in the analysis. I think the data may be already there, if that's what you were planning on using, Matt, or whoever is doing this.

Do you understand what I'm getting at? When you're talking about depletion, if there are uses -- it's kind of like when you're looking at the birds above and below, when you do that analysis with fisheries, you're looking at various sampling areas above and below the diversion, make sure that there's a seasonal component in your analysis of that data, if it's possible.

LISA RICHARDSON: Yeah, Rick. And I think the information that you're talking about is more related to Objective 6. Objective 5 is related to the Platte River; Objective 6 is related to the Loup bypass reach.

RICHARD HOLLAND: I'm trying to get to lunch.

LISA RICHARDSON: But we do have the information from you now, and we'll look at that as it's most appropriate.

STEPHANIE WHITE: I do sense you're

all ready to vote on this as related to Objective 5. Let's see a show of cards.

Okay. We have unanimous greens for the activities associated -- as they are stated for the activities associated with Objective 5.

Now let's talk about Objective 6, which is, Determine the relative significance of the Loup River bypass reach to the overall Loup River fisheries.

RICHARD HOLLAND: Ditto. Can we have a read back of testimony?

STEPHANIE WHITE: So did I hear your response that it would be seasonally appropriate? It's not a read back of your testimony, but it's kind of what I remember; is that correct?

RICHARD HOLLAND: That makes sense.

LISA RICHARDSON: Yeah, we would look at the data. I guess the first thing you look at is overall, and then you start to break it down and look at it in a seasonal perspective or monthly perspective. So yeah, we would look at it that way.

STEPHANIE WHITE: Okay. Let's see a show of cards.

Okay. We've got unanimous greens on the objectives for this.

If you'll let me get into the slides for Study Plan 4, we'll actually be right on target. We'll be right on schedule. So let's start -- we've got another about 20 minutes. I'm going to keep pushing you a little bit.

RON ZIOLA: It appears noon is noon for lunch.

(Inaudible - multiple side discussions.)

STEPHANIE WHITE: Some side discussion that Objective 6 might go faster and we actually could accomplish the totality of it, of Study Plan 6, prior to lunch. So I've got it up on the slide. Quinn, are you presenting this one?

QUINN DAMGAARD: I am, and I hope all mine are before lunch because that seems to be the best time.

As it was proposed in the proposed study plan, there was a discussion on fish sampling, and I think it spawned some confusion during the April meeting with regards to what exactly was proposed. So I think this slide, I guess, will hopefully identify the District's intentions.

The District at this time is not proposing any fish sampling in the canal with association to

the relicensing project. And the reasons are the canal fishery has previously, and even more currently, been identified by Game and Parks as excellent. And that's a reference to Mr. Rutt back in '81 with regards to the previous relicensing effort and his input that went into that application.

I guess no concerns have been raised in the Project scoping with regards to the quality of the fishery within the canal, and I guess we would propose, based on the creel survey that the Game and Parks did in '96 and '97, use is very good, which would indicate that the fishery is good and is appreciated by the local angling population.

I guess the last bullet, there are no issues in SD-2 related to fisheries, actually, within the canal. So all that being said, the District is not proposing fish sampling in the canal, but again, would extend its cooperative efforts to facilitate that sampling independent of Project relicensing at some future time, again, independent of the relicensing project.

STEPHANIE WHITE: Discussion?

DAVID TURNER: Nick just had a few thoughts on that, too, that he wanted me to convey,

and I think it's consistent with what you were just saying in the fact that we don't have any real issues with the canal, Lake Babcock, North Lake. We don't see, at this point -- unless somebody else raises something we haven't heard -- a need for that detailed fish sampling in those areas.

However, as I indicated earlier -- and maybe this is more appropriate here -- is that we are going to need to look at the affected reaches of the bypass reach and the Loup canal -- and the Platte below the canal and Tailrace.

So -- but as I understand from Richard, there is new data that may get to that -- those kind of information you described, habitat and fish presence and abundance in the bypass reach. So he did have some -- you know, basically a request for some additional sampling in those reaches, but I'm not going to belabor the point here until we get a chance to see that data and what it means, and maybe that does answer the questions that he's raised. So just a placeholder so we don't surprise anybody there if maybe something else comes up from us.

STEPHANIE WHITE: Okay. Any other discussion on this?

So I think -- unless you're getting ready

to red card -- I think we're going to -- I think that we may have consensus to eliminate Study 6 but understand that FERC will review the additional data we've gotten, and that this could change after that -- after that time.

QUINN DAMGAARD: Stephanie, if I could clarify, what David is speaking to is sampling within the bypass reach, within the river. This is very specific to the canal. I don't think that anything that David said here would change that, and what we're voting on now is specific to the canal.

DAVID TURNER: To the canal, but just recognizing that we're talking about fish sampling as a whole and that there may be some data gaps associated with that, and in particular, maybe Lost Creek, in terms of how we describe that. There's limited data in the record for us to understand what's going on there, so we may need some data from that perspective.

So it's expanding this scope a little bit in this objective, and we apologize for not raising it sooner, but we're still in the process.

STEPHANIE WHITE: Rick, did you have a comment?

RICHARD HOLLAND: No.

STEPHANIE WHITE: Okay. We're going to take a quick vote on eliminating Study 6 as it is right now, as it's stated right now, which is limited to the canal. We're going to strike Study 6.

Let's see a show of cards.

Okay. I see unanimous greens. We're going to strike Study 6 as it is already written.

And we have 15 minutes to move into the next slide. Do you want to do Fish Passage?

LISA RICHARDSON: Fish Passage.

STEPHANIE WHITE: Okay. We're going to stay on the subject of fish. Fish Passage is next, Study 7, the goal that we have agreed on previously.

The goal of the fish passage study is, To determine if a usable pathway exists for fish movement upstream and downstream of the Diversion Weir.

Objective 1, which has been also agreed upon by this group, To evaluate hydraulic flow, velocity and stage parameters at the Diversion Weir and Sluice Gate Structure.

Associated activities include a review of stage and discharge data at USGS stations; the

collection of hydraulic information, including surveying and river cross sections at the upstream and downstream face of the Headworks; and recording headwater and tailwater elevations at the Diversion Weir; and the last is to review flow duration curves at the Diversion Weir.

Let's have a discussion on these. Quinn?

QUINN DAMGAARD: Yeah, if I could just kind of summarize what this study is all about -- and hopefully it's obvious -- is whether or not the diversion is passable by fish on the Loup River. And I think this would go back to some of the issues that Mr. Jayjack raised and that David has conveyed here today.

So essentially, this is a -- is a hydraulic analysis of the river and the structures and to determine if they're passable. Originally, in the proposed study plan, it was -- it was specific -- or it was worded specific to channel catfish. We have expanded that scope to look at any affected river species, so just to put that out there, David, I think you already brought that up as one of Mr. Jayjack's comments.

STEPHANIE WHITE: Any other comments or questions on these activities? Rick?

RICHARD HOLLAND: With the data that we've collected in terms of -- I agree, I think this study is needed and necessary but what I want to see is the engineering information associated -- the hydraulic information associated with the structure so that we can quantify how much of a barrier it is.

Having said that, I think that from our sampling along the Loup to the middle Loup, the reports we've provided, it suggests that this is not a hundred percent barrier, by any means. Fish do move upstream.

I don't know all the fish that may be penetrating through the barrier at different times of the year. We have not done that kind of a study. We've done a presence or absence and number evaluations above and below.

We don't consider it a permanent barrier. However, it is a barrier seasonally and at certain times. So the -- getting this information, this hydraulic information, helps us work with the District so that if we decided we wanted to do something that would allow freer passage, that we would then have the information necessary to do that.

We are involved in a Loup -- middle Loup

initiative to open up the river completely to fish passage. We're working with the Sargent Irrigation District on the Sargent diversion. We finished the Milburn diversion. Hopefully someday we'll get to the Arcadia diversion.

I'm just putting this out there. I would red card this immediately if we decided to get rid of this study, but I believe this study -- or as is, I think it's a go. And it's good information we need, and it would probably help the District in many aspects too.

STEPHANIE WHITE: So the activities as stated are appropriate?

RICHARD HOLLAND: As long as -- with my limited knowledge of hydraulic information, as long as I'm going to be able to get the hydraulic and engineering information that describes just what the flow dynamics are through this structure -- and I think that's what you're telling me I'm going to get -- you know, if I get that on a seasonal basis relative to the flow of the different seasons, then I think we're getting the information needed to evaluate whatever fish species could be present and could be moving. That's going to have to be based on literature and information.

STEPHANIE WHITE: Okay. George?

GEORGE WALDOW: I'm glad you articulated that so well, because I think that's exactly what we were thinking. And I picked up the microphone, actually, to confirm that the outcome of this study is going to simply be the data set that you're looking for, seasonal, specific velocities, whatever information the District can provide on how often flashboards are down and that kind of thing, or when the weir becomes submerged by high tailwater.

NEAL SUESS: And Rick, we had no intention of eliminating this. Obviously, we put it up here because we think it's --

RICHARD HOLLAND: I didn't want to get your hopes up.

NEAL SUESS: Yeah, we are not planning on eliminating this; we weren't ever planning on eliminating it. It was just a matter of providing the data and then moving forward with it at that point in time.

STEPHANIE WHITE: Is there a question or a comment from this corner back here? Frank?

FRANK ALBRECHT: My question was an internal question on -- an internal question to

fisheries on -- I'm looking at the next objective and the associated activities to see if there actually is a -- a sampling component that's necessary.

And to further compound my question, I guess, is thinking about the water temperature, the other study, and whether there is a -- you know, a sampling -- there's going to be a lot of data recorded during that study as well. I guess my question is you know whether there is a need for sampling, Rick or Dave and others, on this component here.

But if that information that we're looking at under these associated activities under Objectives 1 and 2 is adequate, I'm fine with it. I'm just kind of thinking out loud at this point.

STEPHANIE WHITE: Okay. Rick?

RICHARD HOLLAND: To relieve Neal of that worried look, the -- the data available for requirements of certain species of fish to move against currents, so different velocities, some of that is available in the literature. I'm not -- I'm not a guru on that kind of stuff.

Steve Shainost from our staff does look at some of that when he's trying to work with the

engineers for the fish bypass structures to see just what kind of systems we need for each barrier we look at.

So I think the next objective is what you're getting at, Frank, and I think that it's mainly a literature analysis of the hydraulic data given in this objective. Is that how I'm interpreting what you're going to be doing?

QUINN DAMGAARD: That's correct, Rick. We're going to take the H&H analysis we did in Objective 1 and compare it to the literature, the swim speeds, the bird speeds of the different species that Rick is speaking to to determine how often the diversion is passable by different species. And Rick mentioned seasonally, and we can certainly accommodate that.

RICHARD HOLLAND: So to answer Frank's internal question, we wouldn't require a sampling to see -- to document individual fish species moving past that barrier or not for this exercise.

STEPHANIE WHITE: Kim, I thought I heard your voice. Do you have a question or comment to add?

KIM NGUYEN: (Inaudible.)

STEPHANIE WHITE: Okay. Let's take a vote on the activities associated with this Objective No. 1. Green is a -- fine as stands, and we'll get to Objective 2 in a second.

Okay. Unanimous greens.

Let's move into Objective No. 2, which is, To determine whether fish pathways exist over the Diversion Weir through the Sluice Gate Structure or by other means.

I already see a green on the activities. Would you like me to read them, or shall we vote?

NEAL SUESS: You know, Stephanie, I think we just got done talking about both Objective 1 and Objective 2 --

STEPHANIE WHITE: Okay. Great.

NEAL SUESS: -- at least with what Frank and Rick were talking about before. So I don't know that we necessarily need to go through them other than to have a vote.

STEPHANIE WHITE: Okay. For the record, let's take a show of cards on the activities associated with Objective 2.

Okay. We see unanimous green cards.

We have about seven minutes before lunch. I'll be glad to give you those seven minutes as a

hard-earned break. I'd also be glad to dig into the first slide, probably, of hydrocycling. We have three studies left: Hydrocycling, which is Study 2; Study 4, which is Water Temperature in the Loup River Bypass Reach; and a new Study 13, which is PCB Presence.

NEAL SUESS: Stephanie, if I can make a suggestion -- I'm not sure when lunch will be here -- but instead of waiting until 1 o'clock to come back, if I can suggest we come back at 12:45, just give to us the additional 15 minutes for whatever we need. Obviously, for the last three studies, it's possible we might be able to get out of here a little bit early, or something like that. And if we can do that, that would be great.

I know we didn't need the full hour yesterday. So I guess why don't we plan on coming back at 12:45. We can start that way, so --

STEPHANIE WHITE: We don't have lunch yet. So what I would ask is that we continue until lunch shows up and then take a 45-minute lunch break. Can we push that hard?

NEAL SUESS: That's fair.

STEPHANIE WHITE: All right. Let's get through -- hold on. Do we have a report on

lunch?

RON ZIOLA: It's in transit, I guess. Next time I'm going to have to deal with them like some of my relatives. If I want them here at noon, I've got to tell them 11:30 is the time. I don't understand caterers.

STEPHANIE WHITE: All right. Let's talk about Water Temperature in the Loup River Bypass Reach. This goal, which we agreed to previously, the goal of the study of Water Temperature in the Loup River Bypass Reach is, To determine if Project operations, flow diversion, materially affects water temperature in the Loup River bypass reach with particular emphasis between the Diversion Weir and the confluence of Beaver Creek with the Loup River. That is the objective. This is -- I'm sorry, that's the goal.

This is Objective 1: To estimate the relationship between flow in the Loup River bypass reach, ambient air temperature, water temperature, relative humidity and cloud cover. That objective has been agreed to by this group.

Associated activities, there are five. Pat, would you like to walk through these as a group?

PAT ENGELBERT: I can.

STEPHANIE WHITE: Okay.

NEAL SUESS: And Pat, before you go, just to remind everybody we had both -- this water temperature one, and the Water Temperature in the Platte River -- at the April 21 meeting, it was agreed to by the group that the Water Temperature in the Platte River was a study that we could eliminate, as there was no foreseen benefit of doing that study. But we do believe that there's still a benefit of doing this study. So Pat?

PAT ENGELBERT: The associated activities, there are no temperature sensors currently. Lunch is here. That's not on the slide. But I thought I'd throw that out. Do we want to continue?

NEAL SUESS: It might take them awhile to get up.

RICHARD HOLLAND: Just go through the associated activities.

PAT ENGELBERT: Okay. The first thing that we'll do is coordinate with USGS to install temperature sensors at the Diversion Weir, as well as at the GS gage at Genoa, and we'll collect and review the ambient air temperature at

the weather station at Genoa.

And I believe instead of cloud cover, I believe it's solar radiation -- I think that's the actual statistic that they collect. We'll collect and review relative humidity and solar radiation information at the weather station, and then we will --

LISA RICHARDSON: At Mead.

PAT ENGELBERT: -- oh, at Mead, because I don't believe they collect humidity at Genoa; is that correct? So we're going to use the relative humidity and solar radiation information from the Mead, Nebraska, weather station. I believe that's the closest one.

And we'll also collect and review the flow data at Genoa and in the Loup Power Canal near Genoa, and then we'll just develop plots to identify any general patterns or distinguish trends. So we'll look at -- and I believe we did them systematically, flow versus air temperature, water temperature versus flow, relative humidity versus flow, et cetera, just to see if we can discern any trends. And I believe we begin to combine them, and I think we throw all of them in at once, I think is how it's laid out in the study plan. Let me grab it

real quick.

LISA RICHARDSON: I think the plots are on the next slide, Pat.

PAT ENGELBERT: If we go to the next slide --

LISA RICHARDSON: Maybe not.

PAT ENGELBERT: I believe what we were proposing to do was plot water temperature versus flow, water temperature versus ambient temperature, water temperature versus relative humidity, and water temperature versus solar radiation, to see if there was any relationship between the water temperature and those other parameters.

And I believe we would begin to combine a couple of those parameters, maybe you've got water temperature versus ambient temperature and flow, and then perform -- and if we can distinguish trends, do regressional type analysis to see -- to analyze that particular trend.

So that is the -- those are the associated activities for Water Temperature in the Bypass Reach.

STEPHANIE WHITE: Questions for Pat? Go ahead, Rick.

RICHARD HOLLAND: We had this discussion last time a little bit. We talked about our concerns with your using Genoa as the -- the main impact, the major impact of -- between the diversion and Genoa as the main impact area. And I understand that, and I don't disagree with that.

Our concern was that there may still be an impact throughout the rest of the bypass reach as you go down to the confluence with the Platte. The statement was made that if we make a change in operation that impacts the -- that major impact reach between the weir and Genoa, that should cover the bypass reach. That was the assumption that this design was based on.

I understand why that would -- I mean, understand that that is a possibility, but it's also -- I guess I have a little bit of heartburn, not a red heartburn, more of a yellow heartburn, in the fact that you've still got another 25 miles of river that could immediately relate to your mediated effects, that could moderate the changes in operation, their impacts on the temperature.

What I'm saying they might -- the first 5 miles -- I think that's 5 miles, isn't it, 4 or 5 miles, something like that.

PAT ENGELBERT: Five to six, maybe.

RICHARD HOLLAND: So you can make changes in operation that would affect water temperature for that first 5 or 6 miles but may not impact it all the way, 31 miles. That's a possibility.

What I was hoping -- and part of this thing was we -- I think there's a new gage down by Columbus in the bypass reach that was put in this year --

PAT ENGELBERT: The DNR reestablished the Columbus gage last year.

RICHARD HOLLAND: Do they collect the same information at that gage? Is that --

PAT ENGELBERT: They collect stage data, I believe. I do not believe they collect water temperature at that particular location. Matt, do you know? Mat Pillard, do you know if they collect temperature at that particular location?

MATT PILLARD: I don't know if they do or not.

RICHARD HOLLAND: I guess what I was looking at would be I don't think it would be a very complex mini study, so to speak, as part of this, but to begin a short-term -- trying to develop a

relationship between what happens with the temperature between that last 25 miles so that -- put in some temperature gage. You have the flow, you're measuring the flow, so put in some temperature, do some just quick examination of how changes in flow and temperature between 5 miles relate to the 31 miles.

Does that make -- does that make sense what I'm asking about? I'm just trying to -- instead of --

LISA RICHARDSON: I guess, Rick, part of what we're doing -- and it's not shown on the first objective -- but on the second objective, it would be developing -- analyzing the data and developing relationships between flow, ambient air temperature, relative humidity and cloud cover, or solar radiation, and wouldn't those same relationships be valid down at Columbus? You could tell what the flows are there and if you have the temperature data, wouldn't those relationships still be valid?

RICHARD HOLLAND: I'm not really sure. I guess I would want -- like I said, I would want something to suggest that that relationship isn't going to change over 30 miles of stream.

I mean, one of the things that we -- when we eliminated that other study was the fact that we had this tremendous length of river that was moderating the impact of any temperature changes over a 40-, 50-, 60-mile stretch of the Platte River, so we couldn't detect it.

Well, I guess I turn that back on you and say, here we've got a 25-mile stretch of river that you're assuming is going to be exactly the same. Maybe we need to do something -- some type of simple sampling that would allow us to make that -- that relationship solid.

I mean, I don't think it would be that complicated. I'd have to think about it more. But I think it's something you could do that wouldn't be a tremendous degree of effort, and maybe we could, you know, come have some cooperative way of looking at that. But we do have an interest in the impacts and temperature changes throughout that whole region.

GEORGE WALDOW: Rick, one thing that comes to my mind is the actual length of the remaining bypass reach and what the travel time might be. And I'm wondering, Pat, do you recall what travel velocities are?

PAT ENGELBERT: A day would be a good gross.

RICHARD HOLLAND: In the Platte River, it's about a mile an hour, roughly. I don't know about the Loup.

GEORGE WALDOW: That sounds about right to me.

PAT ENGELBERT: Seasonally dependent.

GEORGE WALDOW: The short-term effect in the -- what I call the critical reach where there's the least flow before the Beaver Creek comes in, the upstream effect of the weather, of the solar gain, whatever parameters we use, coming into the diversion point will accumulate during a day, typically to peak in the late afternoon, probably.

And then that continuing flow -- the bypass flow, if you will, continues on downstream for another four or five hours, probably, before it gets to Genoa. There will be another day's cycle before that water gets to Columbus, theoretically speaking.

And so the effect of Day 1, according to the gage records that we've seen -- temperature gage records we've seen on the -- I'm trying to think of the stream down river where the -- the Elkhorn River

and then Salt creek, they show a very distinctive daily pattern.

And so not only would we be talking about Day 1 and Day 2 -- and my argument here is that if the travel times are anywhere near what we're saying, the Day 2 effect is a separate event compared to the Day 1 event that would be captured at Genoa.

And I'm wondering if that information really has significance, especially if you consider the tributary inflow starting with Beaver Creek and through a couple other minor tributaries. So you've got greater flow and a second day weather, solar gain, that you're dealing with, and it seems like a disconnect to me.

NEAL SUESS: Yeah. I know what you're talking about with that, but I was trying to think of the various creeks that we have flowing -- we have the Beaver Creek, Looking Glass, the Old Lost Creek channel, sort of, the one that comes straight south, and Dry Cherry Creek, which by it's term shouldn't have any effect at all.

But I guess one of the things, Rick, that we were talking about over here is -- and I don't know, I guess I want to first get your reaction to

what George has said.

RICHARD HOLLAND: I understand what you mean by the complicated factors of that and maybe that the river recovers somewhat by that extra inflow. And the complicating factors of the day lag period is something that is -- it makes it tougher to model just what that relationship is.

However, the dewatering or the diversion and subsequent temperature changes, that effect is going to be -- is potentially throughout that entire reach. I mean, because of the lack of water moving down, unless you're saying that it recovers completely through the input of the other rivers -- and I don't think that's what we're saying -- I think what you're saying is most of the moderation and impact in temperature is going to happen in that first 5 or 6 miles, and we can measure the -- what the moderation will be the best. And we have a more difficult time showing a direct relationship farther down because of time, because of inputs.

I understand that. I'm not saying it would be easy. I'm just saying it's a concern because when we record fish kills in that bypass, it's probably not happening just at one portion of that area. And usually by the time we get to a fish

kill, it's an hour or two afterwards these things are happening along that river. And it's not just -- it could be a day after. I don't know what some of the time periods of these reports are.

So like I said, this isn't a serious red heartburn kind of thing. But if there's something we can do to help us characterize what this relationship is throughout that reach, that's what I would be interested in seeing.

I'm not looking at a major study here, I'm just looking at trying to expand the relationships that you're developing in this Project to as much of that stream reach as we can.

STEPHANIE WHITE: A lot of people want in on this discussion. I'll go to John, Quinn and Jeff Runge.

JOHN SHADLE: I was just simply going to comment, we've looked at shallow rivers like the Platte or whatever that tracks daily temperature, and I don't know -- you bring up a lot of good points, Rick, but I don't know -- the overbearing or the overriding thing is obviously going to be ambient air temperature. Ambient air temperature will be the dominant thing that will drive water temperature in the shallow rivers.

NEAL SUESS: Did you have a comment, Jeff?

JEFF RUNGE: No, I didn't.

NEAL SUESS: Okay. I guess, Rick, one of the things that I got to thinking about as you said, maybe what we can do is in the first year of the study, see what kind of -- see what kind of correlation we can find between the various aspects in the bypass reach. And if we see a correlation that maybe we think would come down the river in a different way that we might want to track, then maybe in Year 2, we could maybe do something, say, at Columbus, see what happens there, you know, if there is that correlation that we see, and go that way with it. Instead of going right into it, wait until we see what those correlations are once we plot the data.

Because it obvious -- you know, obviously the data we're looking at is during the summer. I mean, we'll get the first year's summer data, we'll plot it, look at it and say, Okay, here's what we've got, here's what we think it might mean. And if we see some kind of correlation, we go, Okay, given Rick and the Games and Parks' concern, let's go down to Columbus and try to do something similar to that.

RICHARD HOLLAND: This concern that I have may be -- you know, John made good point that ambient air condition -- ambient air temperature is going to be the major driver. I understand that. It may be that the relationship is very straightforward.

It may be that we can determine that by simply putting out some HOBO units and measuring temperature throughout a two- or three-day period of time and solve that very quickly. I mean, you're talking about a $50 unit, go out there and do some basic measurements and the heartburn goes away and we're ready for desert, I don't care.

It's not a major thing, but I just want to make sure that we're not dismissing the fact that we've got 31 miles of river here. We know fish kills are happening below the diversion, I believe in the Loup or middle Loup or somewhere -- I'd have to look at the fish kill records to know -- but I just want to cover the bases so if we do propose mediating change in operations, that we're not going to come back to you and say, It's not good enough because you didn't cover the whole river, you only studied 6 miles.

NEAL SUESS: Sure. And I think we

understand that, Rick.

RICHARD HOLLAND: And I think we can do what you're saying and get there.

NEAL SUESS: You know, even given what you just said about putting something out there during the summer for a couple of days where we can see -- okay, you know, we've now got so many -- you know, we know what kind of flow we had at that point in time, you know, we've got the gage at Columbus, we stick something out there a couple times and let's see if we can follow something that way. That might be as easy as doing something like that. That's something that we can look at and think at and probably reflect at in our study and go that way with it.

STEPHANIE WHITE: I'm going to hear from Quinn and then maybe a quick vote and then lunch.

QUINN DAMGAARD: If I can just back up real quick to basically the 30,000-foot view, the reason that we're proposing what we are proposing is because of what Rick mentioned, the fish kills. And from the data we've received from the Department of Environmental Quality, there have been three in the bypass reach, in '95, '99 and 2004, and they were

all between the diversion and the confluence of Beaver Creek, and that is why our study reach is what it is. That's, I guess --

RICHARD HOLLAND: I understand. I understand that, and I -- I just want to tell you that there's every bit -- I'm not saying that that's not exactly where the fish kills occurred. I also know what a biologist does when he goes out and investigates a fish kill. He goes to the nearest access point he can where he sees dead fish, gets in the river, walks down the river, tries to estimate how much dead fish there are. And after 4 or 5 miles of walking stream, you probably get a little bit tired and go to the next access point.

I mean, I don't know how extensive those fish kills are. We don't do a hundred percent count of those because oftentimes we can't. And so I'm just trying to guard against the fact that we're looking at this 6-mile stretch and the fish kills are happening down below Beaver Creek, for whatever reason, and it may not be temperature, it could be something coming out of an agricultural field that's leading to fish kills, although there are some ways we can look at that.

I'm just trying to be thorough over the

reach. This solves a lot of problems, and I think we can do it with a minimal amount of analysis. So I understand what you're saying from the 30,000-foot range.

LISA RICHARDSON: And I think what Neal was saying is we'd be willing to take a short-term look at Columbus. And depending on what the relationships show at Genoa and at the Diversion Weir, along with the more limited data we would collect at Columbus, if it warrants putting in something more in, we might do that at Columbus on a long-term basis.

STEPHANIE WHITE: Okay. Let's take a quick show of cards, activities associated with Objective 1.

I see unanimous greens. Let's go have lunch. When we come back we're going to talk about Objective 2.

(Lunch break - 12:18 p.m.)

(Meeting resumed - 1:08 p.m.)

STEPHANIE WHITE: We'll wrap up Water Temperature in the Loup River Bypass Reach.

I think there are a number of folks that might have to leave a little bit early this

afternoon. Sounds like the first bus is leaving at 4:30 or a little bit after, so we're going to try to get through as much as we can.

Let's finish Water Temperature in the Loup River Bypass Reach -- didn't we finish this? Yeah.

LISA RICHARDSON: We need to go to No. 2.

STEPHANIE WHITE: Let's talk about Hydrocycling.

MATT PILLARD: I'm going to call John Bender with DEQ and let him know about what time we'll be getting to PCBs. So should I tell him to call in about an hour? He said 2 o'clock, he'd be available, so that's when he's going to call.

STEPHANIE WHITE: That's fine.

Okay. Hydrocycling, this is a goal that we've agreed upon as a group already. Determine if Project hydrocycling operations benefit or adversely affect the habitat used by interior least terns, piping plovers and pallid sturgeon in the lower Platte River. The physical effects of hydrocycling will be quantified and compared to alternative conditions.

Yes?

NEAL SUESS: Just to let you guys all

know, we saved the easy ones for the very end, so we should just sail through. So you're not allowed to comment, Rick.

STEPHANIE WHITE: First objective -- and I'll change the flip charts in a second -- the objective is, To compare the subdaily Project hydrocycling operation values, maximum and minimum flow and stage, to daily values, the mean flow and station. In addition, to same-day comparisons, periods of weeks, months and specific seasons of interest to protected species will be evaluated to characterize the relative degrees of variance between hydrocycling -- the actual hydrocycling -- and alternative conditions in the study area.

So while I'm flipping to the charts, I'm going to give this to Pat. You can walk through the activities when you're ready.

PAT ENGELBERT: The activities associated with meeting this objective include collecting flow and stage data to determine the timing and frequency, rate of changes, et cetera, for the subdaily flow and those relative stage changes. And then we will develop and plot hydrographs for the Project as well as any alternate scenarios that come up throughout the study process.

In the study plan, the gages that we are proposing to look at are the Loup -- I'm sorry, the Platte at North Bend, the Platte at Leshara, the Platte at Ashland, and the Platte near Louisville.

So again, what we would look at is we would get the realtime gage data that's coming out of the power canal at this Eighth Street gage out here, and then plot -- combine that with the Platte at Duncan, and then plot on a daily time series the hydro -- the effects of hydrocycling on the discharge.

So any comments on that?

STEPHANIE WHITE: It's fine as is?

Okay. Rick's ready to vote. Let's do that. Maybe we'll see a show of cards on the associated activities with Objective No. 1 for Hydrocycling.

Okay. We see unanimous greens. Let's move on to Objective No. 2.

Again, this is one that we've previously agreed upon, To determine the potential for nest inundation due to both hydrocycling and alternative conditions.

PAT ENGELBERT: So from these plots that we've created, we would take a look at what our

highest flow, what we would term the benchmark event, would be prior to June 1, take a look at what was the highest discharge that occurred prior to June 1 based on those annual hydrographs that we had developed.

And then we would take a look at -- and the June 1 came from, like, the nest initiation period; is that correct? And then we would identify any events that the flow was greater than that benchmark event from June 2 to July 2 and evaluate frequency of occurrence of flow events equaling or exceeding that benchmark flow for a given year.

And then the bigger question is evaluate the Project operations relative to those benchmark flows, could anything have been done operationally to prevent that accedence from occurring between June 2 and July 2.

So those are the activities associated with looking at potential nest inundation as a result of Project operations.

RON ZIOLA: This is Ron Ziola, Loup Power District.

Sometimes working with specific dates and in working with the tern and plover people, we don't see things happen exactly by date. I'm wondering if

it's, like, early June through mid July because of how flows and stuff change and when the birds show up, as compared to making it specific to those two dates.

MARY BOMBERGER BROWN: I should also say that it's also the case that plovers arrive and initiate nesting two or three or four weeks before the terns do, so there is a biological difference, there is a difference in time with when the birds arrive and initiate.

STEPHANIE WHITE: So we're having a discussion about that second bullet, which is the time periods between June and July; is that right?

Yes, George? You need something to speak with.

GEORGE WALDOW: I agree with both comments. I think that having the dates this specific is probably not in the best interest of our result, and we need to have more flexibility.

The intent here is to capture the controlling benchmark event, if you will, that happens just prior to or right at the initiation of nesting, and nobody really knows when that's going to be. So we're going to look at probably all the month of April, I would guess, for events, and we

can be more flexible. And I'd probably suggest taking out the specific dates.

STEPHANIE WHITE: So George has -- the motion on the table is to eliminate the specific dates, both in the first and second bullets, George?

GEORGE WALDOW: I'm sorry?

STEPHANIE WHITE: In both the first and the second bullets?

NEAL SUESS: Yeah. Just looking at the -- the proposed study plan, Task 4, which is the seasonal inundation item, we talk about the May 1 to May 21 date, and then looking at subsequent flows from May 22 to August 1.

You know, I guess my thought process on this, with leaving the June 1 in, is that -- I mean, obviously, if you have a high flow between, say, the May 21 and the May -- and the June 1 date, I mean, that's going to show up in there.

Obviously -- and I'm trying to get it back to what we actually had in the study plan, per se, which was May 1 to May 21, and then May 22 to August 1. That would cover probably a large enough period, I would think, to take care of that.

MARY BOMBERGER BROWN: Can you repeat the first part of that? I was visiting with Bob

here.

NEAL SUESS: Well, the actual task in the proposed study plan says that we will identify the highest river stages from May 1 to May 21, and then subsequent flow events occurring from May 22 to August 1. You know, it seems to me that if you haven't had a -- that you're going to have your high flow event before May 21.

I mean, obviously if you look at it from May 21 to June 1, you're also going to identify the flow events from May 22 to August 1. That should cover enough time for those high flow events with the terns and the plovers to take care and meet any potential dates that you have in there.

I mean, I realize that we want to maintain some kind of flexibility, but I think if we keep this wide enough, from May 1 to May 21 and then May 22 to August 1 -- if the benchmark stage is not exceeded after May 21 as a result of normal Project operation, and then it talks about what can be concluded out of that.

It seems to me -- you know, I'm not sure where we came up with the June 1 and the June 2 and July 2. But at least in our proposed study plan, we talked about May 1 to May 21, and then May 22 to

August 1, so --

MATT PILLARD: There's two things here.

The first is we wanted to identify a benchmark during that prenesting period because that's when they're out there establishing their nests.

But then we also recognize that there's this period from June 2 to July 2 where, if indeed there is an accedence during that period, they could theoretically renest; is that correct, Mary?

MARY BOMBERGER BROWN: Yes, yes.

MATT PILLARD: Okay. So we really wanted to identify two periods here. One, prenesting, and maybe that's the best way to phrase this, is we want to identify a prenesting period, that could be the first bullet, and then a -- you know, either a secondary nesting or a second opportunity. That's the way that, I think, we were approaching it, is that we felt we needed to capture that second opportunity.

And if there was an event that happened in June, that they could theoretically still renest -- if there was a high event, they could still theoretically renest during that period. That

would, in essence, maybe re-establish that benchmark for the rest of the nesting period.

I'm interested in your thoughts on the dates and things, Mary. We're pretty flexible on the dates. We want to do what makes sense for the birds and their nesting periods.

MARY BOMBERGER BROWN: I like your approach, and I like Neal's later date in August. If we could get a hybrid of those two dates, I think that would -- I feel more comfortable with that.

LISA RICHARDSON: I think that it maybe looks like we omitted that later date on our slide and that this is the -- this is that ability to renest period. And then you need to look at, Okay, after they've lost that ability to renest, what is the -- how many times is it inundated?

And I guess -- I know, Ron, you mentioned some ability to be flexible, but this is looking at the historical data, and we're not going to know what was the right date in 2004 versus what was the right date in 2005.

So I think it would be better to come to agreement on a date that we're going to use for evaluation over the period of the years that we're going to be looking at it. And -- because I don't

know that we'll be able to say, In 2004, it should have been May 31. Does that make sense, or --

MARY BOMBERGER BROWN: Yes. I would feel much happier with that, if we can go until the August date.

RICHARD HOLLAND: That's not what she's saying.

MARY BOMBERGER BROWN: No, that was what I was saying, Rich.

RICHARD HOLLAND: You're saying you're going to define the secondary nesting period, or whatever you want to call it, the renesting period, all the way through August 1?

LISA RICHARDSON: No, no, that's not what I was saying, and I don't think that's what Mary is saying either.

MARY BOMBERGER BROWN: I'm interested in going through August 1, because even for the second nesters, they have to have their 28 days to get to fledge. So I'm interested in the late date for completion, renesting success.

RICHARD HOLLAND: But what I'm saying is, Mary, that I think what we're looking for is to define -- what those are defining are the prenesting period, that's through March 21 in this initial

document --

NEAL SUESS: May 21.

RICHARD HOLLAND: -- May 21 -- and the secondary nesting -- potential secondary nesting period was defined here by the June 2 to July 2, okay?

LISA RICHARDSON: Essentially.

RICHARD HOLLAND: That means all the benchmark overflows following that will be considered inundation period -- as inundation. But I guess what we're trying to buy into is two separate analysis kind of scenarios here, one with just the prenesting period, and we need to come to a consensus on if the May 1 to May 21 is acceptable, and then the -- what do we want to call it, secondary nesting, renesting, what's -- you're the bird guy, or gal --

MARY BOMBERGER BROWN: I'll say renesting.

RICHARD HOLLAND: Renesting?

MARY BOMBERGER BROWN: Yeah, that's a good word.

RICHARD HOLLAND: We'll call it the renesting period, is June 1 through -- or is May 22 through July -- July 2 -- I mean, what do we want

that period to be? If these numbers aren't good enough --

STEPHANIE WHITE: So let me just ask specifically --

MARY BOMBERGER BROWN: Let's start over.

ROBERT HARMS: Let's try this again.

MARY BOMBERGER BROWN: I think we're talking about -- our dates are getting confused here.

STEPHANIE WHITE: And I do think that Rick is caveating it well. I think we're talking about a prenesting phase and a renesting phase. And we need to bookmark the ends of what those are. What's the prenesting phase, what's the renesting phase? And I think if we throw out the dates on this slide, I would look to you and say what should they be?

GEORGE WALDOW: If I may, I made a mistake when I suggested throwing those dates out, and I was not thinking of what Lisa brought out, the fact that we're hind casting with this information.

And so if it's important that we define those phases and we do need to have dates, my intention was simply that I didn't want us to argue

over dates because it doesn't matter to us, we just need to select dates.

STEPHANIE WHITE: So tell us what they should be.

MARY BOMBERGER BROWN: I think I would be happier, knowing the birds, if we did the prenesting through May 31 and then renesting June 1 through July 15.

STEPHANIE WHITE: And when does the prenesting start?

MATT PILLARD: I think from a benchmark perspective, you would be looking --

MARY BOMBERGER BROWN: Well, the earliest record is April 25. Can you -- April 25.

STEPHANIE WHITE: Okay. So we are talking about prenesting --

MARY BOMBERGER BROWN: Because that would certainly encompass all arrivals and -- yes, I would be happy with April 25.

STEPHANIE WHITE: Prenesting, which is a period as we've now defined it from April 25 to May 31. And what we're calling renesting is a period from June 1 through July 15.

MARY BOMBERGER BROWN: I'm combining both species into these same sets of dates. Now,

the plovers will be in the early half of both of these periods, and the terns will be in the last half of both of these periods. So I'm combining these two together, as long as that's good.

RICHARD HOLLAND: I just want to make sure we're all clear, is the prenesting period where you set the benchmark before the time period before April 25? Because there --

STEPHANIE WHITE: Yes, we're getting some nods.

RICHARD HOLLAND: Okay. Now, they're going to set their benchmark at the highest point before April 25, right? And then the prenesting -- or the nesting period is April 25 through May, or whenever?

MARY BOMBERGER BROWN: Yes. When the bulk of nest initiation takes place, yes.

RICHARD HOLLAND: So the April 25 through May 31 is that period of time, first nesting, whatever we want to call it.

MARY BOMBERGER BROWN: Right.

RICHARD HOLLAND: And then the renesting time is from June 1 through July 15.

MARY BOMBERGER BROWN: Yes.

RICHARD HOLLAND: So there's your

three periods. You have two analyses, one based on a benchmark set prenesting, pre April 25.

MARY BOMBERGER BROWN: That works good.

RICHARD HOLLAND: I'm saying this partially for my benefit so I understand it.

MARY BOMBERGER BROWN: Yes.

RICHARD HOLLAND: And if people don't throw things at me, I think I'm right.

MARY BOMBERGER BROWN: Yes, with the understanding that the plovers are operating in the first half of both of those periods, and the terns are operating in the second half of both those periods.

STEPHANIE WHITE: So the first bullet, Determine highest flow of the benchmark events, now reads, Prior to April 25, and flow events equal or greater than the benchmark event from June 21 to July 15. That's how those first two bullets read now.

NEAL SUESS: I think you mean April 25 through July 15. You've got, Determine the highest flow prior to April 25, and identify flow events equal or greater than the benchmark event from April 25 through July 15.

STEPHANIE WHITE: Yes, yes, yes.

RICHARD HOLLAND: Or you could consider those separate periods. It's the same --

NEAL SUESS: Yeah, you could do two different periods from April 25 to May 31 and then another one from June 1 to July 15.

STEPHANIE WHITE: Yes, yes, yes.

RICHARD HOLLAND: And what that does is put a little biological meaning into it in terms of the concept of renesting. And so it's just -- it won't make too much of a difference in terms of -- well, it will make a difference in terms of your analysis because you're resetting your benchmark. But that -- I think it's a matter of organizing your data and running two analyses.

STEPHANIE WHITE: So this second bullet with the brackets would be to your point, Neal, April 25 to July 15. And maybe we --

RICHARD HOLLAND: April 25 through May 31 and June 1 through July 15.

STEPHANIE WHITE: And what I was about to offer is that we have secondary bullets underneath it and do just that, so one of those two things.

Okay. Any other discussion on these

activities?

MARY BOMBERGER BROWN: These dates do reflect what the birds actually do in this part -- in the Loup area. So yes, those dates are the best representation of what the birds actually do.

STEPHANIE WHITE: Okay. Any other discussion? Pat?

PAT ENGELBERT: So we are going to look at the benchmark event between April 25 and May 31, and then if a -- if there's a flow that --

STEPHANIE WHITE: No.

RICHARD HOLLAND: No.

STEPHANIE WHITE: No.

RICHARD HOLLAND: First benchmark is pre April 25. There may be a secondary -- secondary benchmark in the first time period.

PAT ENGELBERT: From April 25 to May 31.

RICHARD HOLLAND: During the nesting period.

PAT ENGELBERT: Then we'll look at the number of accedences, then, post June 1, if there is an accedence --

RICHARD HOLLAND: Right.

PAT ENGELBERT: -- between April 25

and --

RICHARD HOLLAND: For that year, if there is an accedence, yeah.

PAT ENGELBERT: Thank you.

STEPHANIE WHITE: Show of cards. Let's see. Excellent. Unanimous greens on Objective 2 on Hydrocycling. We have four objectives to cover.

Three, To assess effects, if any, of hydrocycling on sediment transport parameters. This is one we agreed to prior.

Associated activity is to determine sediment transport indicators, effective discharge and total sediment transport, for Project and alternative condition subdaily hydrographs.

Any discussion? We're ready to vote. Let's see a show of cards.

Okay. Unanimous greens on Objective 3.

The last objective for Hydrocycling, To identify material differences in potential effects on nesting habitat of interior least tern, piping plover, and the pallid sturgeon. This one has been agreed upon.

The activities are: To examine effects of hydrocycling pulsing operations to tern and plover

nesting sites on other rivers and compare to conditions resulting from District operations.

Second activity, Review river conditions on the Missouri River below Gavins Point Dam and compare to lower Platte River below the Elkhorn River confluence.

Matt, go ahead. Then we'll hear from Jeff, and then Mary.

MATT PILLARD: Just a little elaboration on -- on the objective.

Nesting doesn't belong in the objective, we didn't feel, because it's habitat for the least tern, piping plover and pallid sturgeons. Pallid sturgeon don't use nests. So if anyone objects to that change, we'll scratch nesting from the objective. I don't know what the protocol is for that, but that's something that should -- needs to happen.

STEPHANIE WHITE: Would anyone object to the deletion of the word nesting in Objective 4 for Hydrocycling? If you would object, please raise your hand.

I'm going to scratch it out. There have been no hands raised. We're going to scratch it out, and now let's discuss the activities.

MATT PILLARD: The first part of this, looking at least terns and piping plovers, what the intent would be to look at other rivers where there is cycling or pulsing occurrences that happen, look at the conditions on how they're doing that, why they're doing that, and what the results are on the terns and plovers, and look at how does that relate to what Loup's operations are. Are those operations similar? How similar are the rivers? Is there a comparison that can be made to look at how those -- how those interactions take place between the two.

The one example that we have is the Missouri River below Gavins Point. We know they specifically do that in some years where there's a -- flow is available in Lewis and Clark Lake, sustained during the year. They do do a three-day pulse, then, to push those birds higher during nesting season so that they don't get inundated through what higher flows go later on.

So we wanted to see what, if any, similarities exist between those operations -- there might be other operations we haven't identified yet -- and how Loup operates. So that's kind of the first piece there.

Maybe we can leave it at that with that first kind of activity first and move on to others.

JEFF RUNGE: And I think before we get into these activities, there's a discussion here I'd like to revisit. Just talking to Gary here, I'd like to get his interpretation again on the application of one-dimensional and two-dimensional models, and I guess the effects of singularity.

GARY LEWIS: I need you to expand your question. I don't understand.

JEFF RUNGE: I guess in previous discussions, you said that the application of the one-dimensional or two-dimensional model is limited for the Platte River because of this singularity issue. I guess I'm trying to get a better understanding, because I would like to have that potential application here to address this objective and to look at the direct effects of hydrocycling on the habitat, and to also apply these measured cross sections in the Platte River -- apply different hydrocycling scenarios towards these indices of habitat.

RICHARD HOLLAND: Can I make a statement while Gary is thinking?

STEPHANIE WHITE: Yes.

RICHARD HOLLAND: I think -- Jeff, correct me if I'm wrong here -- but I think what the -- the potential effects on habitat in terms of plovers and tern, one of their -- I look at it in a very simplistic -- Mary, you correct me if I'm wrong too -- there's two kind of ways that you can impact that habitat.

One is inundation where the water just raises above and you wipe out the nests completely, and the second -- the other way is that the erosion of the sandbar due to the actions of the raising and lowering, the cycling period, and so how -- if -- how significant that is in terms of its effect on the nesting of the birds -- the successful nesting of the birds in terms of the erosion of sandbar habitat.

So I guess if that's -- if that's what you're asking, how do we measure that, or how do we get at that problem, if it's a real problem, and is there a way of getting at that kind of influence of just the fact that we -- we know the water is raising and lowering, and it's having an erosional effect on the sandbar, I think that's -- that's the question that's, in part, being raised.

JEFF RUNGE: And for pallid sturgeon,

the implications are pretty obvious there in regards to depth and velocity changes.

GARY LEWIS: I can take it. And thank you, Rich. I think that helped in defining the question, in my mind at least.

I was sitting here -- the reason I was hesitating is I was trying to relate it to the activities, the question, and they don't really relate. These activities are looking at other rivers, not the Platte, to try to answer this objective.

And it's fair for you to go back to the original question on how to potentially deal with this lack of technology. We do not have technology that will allow you, on the second part of Rich's comment, to determine, if the flow is at a certain level, whether the sandbar that might be used for nesting is going to laterally erode. That does not exist, and a 2-D model will not get that for you. It just will not, even if you didn't have the nonsingularity problem. We don't have the tools that will do that.

The best tools we have is across the entire braided river, we might be able to say -- if there was a change in the flow or the hydrocycling

was changed, we might be able to say whether that overall bed is going to degrade or aggrade. That is the state-of-the-art, folks. There is no state-of-the-art that says, In Channel 16, that bar where there might be a nest could erode, undercut and impact that species. And a 2-D model just won't get that to you, even in a singular situation.

And then in a nonsingular situation, we can observe the flow and the -- the habitat on any given point in time, but you can't take that and predict what would happen to that habitat if flow was 50 percent higher or 50 percent lower. We just don't have that technology. It doesn't exist.

So that's sort of the same answer, I think, to the earlier question on these 2-D models.

STEPHANIE WHITE: Rick, a question from you?

RICHARD HOLLAND: Not a question, just a statement about what you're saying.

STEPHANIE WHITE: Okay.

RICHARD HOLLAND: What you're saying is that the modeling capabilities aren't able to address this, which leaves us more to an empirical assessment. I mean, it's -- what I'm saying is it would be at least functionally possible to go out

and characterize -- and get a subset of sandbars that are of a certain height, dimensions, whatever, measure the change in morphology of sandbars as you have fluctuations occurring in the river, and to try to devise an empirical relationship there.

I mean, that -- I'm not saying that's what we're going to do, I'm just saying since we can't model it based on the kinds of models that you've been talking about because of these problems, we're almost reduced to an empirical type of approach to estimate that. I'm not saying that's what we're going to require happen, I'm just saying that in my mind, when I think about it, that's how I would probably try to approach that question of describing what impact that change in water level might have.

GARY LEWIS: Rich, you'd have a better shot at the empirical approach. But going back to my earlier comment on the amount of effort it would take to get there, you'd have to do an awful lot of observations over a fairly long period of time because of the nonsingularity thing. So, you know --

RICHARD HOLLAND: Well, it wouldn't be over a long period of time because it would only have to be between -- during the nesting period.

So I mean -- because, really, if it survives a two-month period, the birds are gone for the nesting.

So I guess I understand what you're saying. I'm just saying that I agree with you that maybe the modeling aspects of it aren't going to get us where we might want to be in the long term to really understand how these things are functioning. I don't know if that's a proper purview for this relicensing effect or not, but it is something that biologically, we know occurs. So we just -- I don't know how to get there yet.

STEPHANIE WHITE: We've got a lot of people that want to talk. Let's hear from you, George.

MATT PILLARD: Well, I was just -- from an empirical standpoint, teasing out the Project effect then becomes the challenge. And we know that there's things going on, but how do we, from a measurement, know what would Loup's contribution to that change, if any, is. I mean, and obviously you're aware of that. But just for the discussion purpose, that then becomes another challenge as part of that.

GEORGE WALDOW: One thing that -- in

fact, we were talking about it -- I don't know if it got started before we sat down for lunch or not -- as a -- as a semi-empirical approach, what I have in mind here to address this question is -- and Gary and I have talked about appropriate time frame -- but to use the effective discharge method, to take, say, a year's worth of data -- we could do it for a wet year, we could do it for a dry year, we could do it for an average flow year -- and we could do it for the entire year, or we could do it for the nesting season, or all those things, the idea being that we can take the data which we have available from gaging stations, which includes the discharge from the Tailrace Canal, which is available in 15-minute time increments. We can take hourly values, for example, which would give you 8,760 values per year. We could perform the histograms. We could apply the sediment rating curve and do that for years of actual flows, actual operating flows of the hydro, combined with the flows in the Platte River, then repeat that analysis, assuming the Project did not hydrocycle, or that it did not only not hydrocycle, but there was no Project, no diversion at all, repeat the analysis and look at whether there's a change in the effective discharge

for any of those periods.

It's a way of backing into a what-if scenario. And whatever distance -- difference was measured could be looked at in the context of is it significant or not in terms of changing the dynamic equilibrium of the stream.

RICHARD HOLLAND: Would that give you the degree of aggradation or degradation for that time period, the change between the Project effect and non-Project effect?

GEORGE WALDOW: I believe it would. It would give you a differential.

RICHARD HOLLAND: In terms of the relative amount of degradation?

GEORGE WALDOW: Correct.

GARY LEWIS: In addition to the effective discharge, we'd also know the total sediment transported, and that's how you get at the handle of the degree of aggradation/degradation.

STEPHANIE WHITE: One second. Did you hear that?

RICHARD HOLLAND: Sorry, I did not.

STEPHANIE WHITE: Gary, go ahead.

GARY LEWIS: Rich, I was just going to say, you get a handle on the degree of

aggradation/degradation from the second of the two parameters. That is the total sediment transported. If there's a difference, then the difference is the degree, and how -- over what length we extend that is a geomorphic problem that we solve. But you can get a handle on the degree of aggradation/degradation.

JEFF RUNGE: I just had an idea that I wanted to turn over, and I just want to get your thoughts, too, that having these field measurements and looking at the longitudinal effects of erosion, and doing that work based on Rick's focus here on an empirical model, the first objective there, I believe, does a good job of quantifying the Project's effects --

STEPHANIE WHITE: And you mean objective, or do you --

JEFF RUNGE: -- in quantifying the downstream attenuation of the cycles.

STEPHANIE WHITE: Are you talking about the activity, or are you talking about Objective 1?

JEFF RUNGE: No, the actual Objective 1. In identifying the attenuation of that hydrocycle as it progresses downstream, with the --

with that attenuation and the development of an empirical model, I guess would there be a relationship that could be developed based on that -- the differences in the level of stage?

GARY LEWIS: And I was reading the objectives -- would you restate the question? I'm sorry. Go ahead.

JEFF RUNGE: In regards to an empirical model, could field collected information be used and applied towards these differences in peaks and troughs associated with the hydrocycle as it progresses downstream? Is there -- is there any ability to draw a relationship with that longitudinal type evaluation?

GARY LEWIS: Longitudinal, meaning profile changes in the bed?

JEFF RUNGE: Yes, rates of erosion, rates of lateral erosion and changes in those rates as you move downstream, as those -- as the hydrocycle attenuates.

GARY LEWIS: The answer would be no, we don't have the technology to do anything lateral.

RICHARD HOLLAND: You're talking about total erosion? I think what -- I understand what you're getting at is that --

JEFF RUNGE: I'm saying you go in with a survey grade GPS unit, you measure the rates of erosion or the rates of change in that sandbar over time. I think that, technologically, you are able to do, it's just can you draw your relationship longitudinally based on those rates of erosion.

GARY LEWIS: I thought you were trying to model those rates of erosion. You want to measure them?

JEFF RUNGE: Yeah. This is development of an empirical model based on actual measurement information.

GARY LEWIS: I think the long term that I mentioned wasn't just within the year, it was over a number of years. So I think, Rick, we would need to have data over a number of years of that kind where you're actually measuring the rates of erosion in order to try to develop the relationship -- the empirical relationship that you can apply to nonhistorical conditions. Because you're going to change the hydrology or change something else in order to apply these -- what happened in the past under historical conditions to conditions that haven't occurred yet.

You're basically looking at scenarios that

are what-if sorts of questions. It's very difficult to apply empirical data to what-if questions.

RICHARD HOLLAND: But we're not suggesting that a sandbar eroded differently because the Project is changing water levels versus some other -- that's not -- what we're saying is that any kind of change in water level will have some type of erosive function associated with a sandbar. Empirically, we can document that. And by documenting how the flow is changing during that period we're measuring the erosion, we can get some type of an empirical relationship. I don't think it would take years, I think it's just a matter of a number of observations of different sandbars to strengthen the relationship.

What you're trying to do, I think, is then apply that to a modeling -- an overall system-wide model that would predict if I change operations, that the total amount of sandbar habitat would shift by a certain amount, and there I might agree with you.

I think that's -- I think that we're talking at two different levels. I'm talking more about what happens to an individual sandbar because of the potential -- a potential erosional impact of

lowering or raising the water, versus overall habitat availability of a certain type. And I'm not sure what would -- what we would need. I'd look back to you to give me that more -- is that --

GARY LEWIS: I'm getting some clarification on it. I think I'll let George comment here in a minute.

But the -- I mentioned to both Dave and you, Rich, during lunch a study by Norman Smith, 1971. He was a professor at Kearney State at the time. He published this in a peer-reviewed publication, and let me read a couple some excerpts from this.

The empirical understanding, I believe is where to go. The problem is, I don't believe that we can develop that understanding and be able to apply it in a relicensing situation. Somebody needs to do this, and that's why I talked to you at lunch. Let's continue, as Nebraskans, to try to figure out some tool for doing this.

They haven't come up with it on the Central Platte, and we're not going to come up with it here in the lower Platte, that tool for what we're talking about.

But a couple excerpts from his paper --

and I would send this to anybody who cared to receive it. Braiding in the lower Platte River -- this is a quote -- is a low discharge phenomenon brought about mainly by dissection of transverse bars.

That's an important point. I sent this same paper, I think, to Mary a few weeks ago. That's an interesting comment. So how does that factor into your empirical discussion? You guys are -- you know, there seems to be an implication that flow will rise and go around these bars and erode them. That isn't how it forms. He's saying it's formed by dissection of these transverse bars. So there is empirical information.

A couple others here, During low flow, the water rapidly dissects the shallow transverse bar complexes and becomes confined to one or more thalweg locations.

Now, he studied about 30 miles of the lower Platte, from -- the title of the paper is Braiding -- or I'm sorry, Transfers, Bars and Braiding in the Lower Platte River. What better publication could we all be referring to in trying to understand than a person who went out and literally looked in the river, what's going on out

there, and wrote up a peer-reviewed publication on it with some very interesting comments? And there are eight or ten more here that I don't need to go through right here. I have these on some slides if we want to talk about them.

But you know, he say the purpose of the report is to examine the processes and characteristic features associated with bar formation and braiding in the lower Platte since details of these generally are lacking. In 1971 he recognized the same problem we have today. And he made an attempt, through this research from North Bend to Valley on the lower Platte. He looked at Schuyler to Grand Island on the middle Platte. And he did go up on the Loup and studied these sandbar processes.

He'd had an earlier publication on these transverse bars, in general, across the spectrum, and then he went into the Platte and looked at this. But comments like, Bar heights usually range from a few centimeters to occasionally over 1 meter. He said, During one lay of low flow 520 CFS -- that's a pretty low flow down at North Bend -- the flow is quickly confined to a single meandering braid.

So there's that understanding of the

process from someone who got in the river and looked. And I suggested to Rick during lunch that maybe out of this paper, people could devise a tool for doing what we're all talking about here, how do we get a handle at changes in flow and sediment and their effects on sandbars? I'm just saying, we don't have a tool, other than effective discharge, to do that right now.

We believe through the study plan that we wrote that the necessary and sufficient analysis for the effects of the Project on the ecosystem is written in that study plan. It is the best available technology. I'm not sure what else we can say to convince people of that. It's what we have and it's all we have, and we cannot project to we druthers. It just exists, and I think it ought to be put to rest at some point.

STEPHANIE WHITE: I would like to ask -- because I don't know anymore -- are we talking about an activity that is missing from Objective 4? Lisa is shaking her head. Are we talking about another objective, are we talking about an activity that goes in another place?

LISA RICHARDSON: I think a lot of what we've been talking about is Objective 3, assess

the effects, if any, of hydrocycling on sediment transport parameters.

JEFF RUNGE: Before we get sidetracked here, I --

STEPHANIE WHITE: I think we are sidetracked. That's my point.

JEFF RUNGE: Well, I don't. But I think we need to continue this discussion before we lose the train of thought and have to revisit all this discussion from the past. I don't want to lose this train of thought.

I guess would these limitations in empirical models, one-dimensional models and two-dimensional models, would that apply to pallid sturgeon and fish habitat in the water as well?

GARY LEWIS: You know, I'm not sure. That's a very broad question. But I believe that the work by Smith applies. And if you look into it, it talks about when single braids form, that connectivity occurs. So yes, that's in there. That's in the issue of can we learn some things from somebody who's been in the river and studied it about the pallid sturgeon habitat.

He wasn't looking at habitat for either the fish or birds, he was interested in morphology.

But absolutely, it talks about some things, I think, that are eye-openers for those who think they know how this river works in terms of the wind, water might form a single braid.

If you went out on a certain day and connectivity wasn't there, if you wait a day, it probably would be, according to Smith. So you can't just take a snapshot in time and say it's not there that day and presume that it wouldn't be there or that the fish wouldn't wait -- and I don't know if they would, you know, how long would they hang out? I think they can sense movement of water because they're attracted to higher velocities and deeper pools, according to the Academy of Sciences folks.

But that kind of understanding is what needs to be invoked here, that it is a very dynamic system, that during low flows, there's an awful lot going on that Smith points to.

Now, as far as effective discharge and its ability to look at pallid sturgeon habitat, I say yes. I think my earlier comment that morphology defines the habitat, and if the morphology hasn't changed, or if any change can't be linked to the Project, then the habitat is there, and the Project and its relicensing can go forward with a conclusion

about whether its impacting that resource.

STEPHANIE WHITE: Let's hear from George, then we'll hear from Jeff.

GEORGE WALDOW: It's been so long, I almost forgot what my comment was.

But I think what I wanted to say is if we're -- we're kind of -- we've gotten back into the sediment issue, but with respect to hydrocycling.

And the approach we've taken on hydrocycling, in an attempt to deal with the variation of flow, which is -- even though it's an artificially induced variation of flow, in many ways it's also the only thing that's constant in the river after 75 years. It occurs almost every single day. And we've talked to this before, that the system has very -- probably very completely adapted to that situation through the years.

And what -- what we tried to do in the hydrocycling analysis is to see how that daily variation fits within the natural variation of the stream. Because it's -- it's not as singular as, Rick, I think you were kind of trying to hint toward with looking at, say, a nesting season and monitoring sandbar erosion. The singularity is lost because the river moves up and down of its own

natural causes, as well as any other manmade issues outside this Project.

So it's -- it will be shown in the plots that we're going to be producing where we are plotting the flows -- the average daily flows and then superimposing on that the variation due to hydrocycling. And we're going to look at -- I'm not sure this was clear to everyone, that we're going to look at periods of a week, we're going to look at periods of a month, we're going to look at periods -- seasonal periods.

And what the -- what the early plots that we've run out to see if this made any sense seemed to show that the variation due to hydrocycling from the -- from zero to maximum of 5,000 CFS at the Tailrace Canal, superimposing that on the variations that the river has in it is -- the range of hydrocycling is well within the range that the river has on its own.

So it's -- it's not like it's a stand-alone thing. It doesn't occur in the same temporal zone, if you will, because it's a subdaily change. But if you look at a week or two weeks' flows, the river does cycle, and the range is larger than the variation -- in some cases, far, far larger

than the variation due to hydrocycling.

RICHARD HOLLAND: I understand what you mean by that in terms of the total variation that the river -- the river may exceed the variation in change relative to hydrocycling, but that doesn't necessarily mean that the change in -- because of hydrocycling, it's ineffective in terms of impact. Because at the time that subdaily change is happening, it's an instantaneous impact versus one that's elongated over a period of time.

I understand what you're saying --

GEORGE WALDOW: It's not instantaneous.

RICHARD HOLLAND: Well, relatively speaking to the -- if we take flow events, shall we say, that are episodic and we just look at the normal change over seasons that a river goes through, then I would suggest to you that it's -- it's closer to being an instantaneous change in a particular area of the river, the impact of that hydrocycling peak and valley, versus the slow change in stage that you would see on a -- on a seasonal basis as it develops over time.

In other words, the river isn't going except in a -- in a -- either a -- during a spate or

following a spate, the river is going to go up, then it's going to go down. But if you take those out of the mix and just look at the seasonal changes in river, it's a more gradual change, relatively speaking. That's all.

STEPHANIE WHITE: Jeff, it's your turn.

JEFF RUNGE: The Platte River -- the Platte River Recovery Implementation Program commissioned a study that looked at the effects of variations in flow and how that would affect microhabitat of the pallid sturgeon, flow velocity, flow depth. And that -- that study was granted to HDR.

I've got their progress report, and I'm citing Sentence 3 of the last paragraph of Page 2, in the stage change study first progress report, and it says, Work activities for 2009 include completion of the high flow data collection effort, developing the second progress report on field work activities, finalizing the hydrologic analysis, the 1-D model and the 2-D model.

Now, I guess I'm wondering, for this effort here, I guess, why wasn't effective discharge promoted as the method for showing that relationship

between stage and flow, and why was 1-D and 2-D models promoted?

PAT ENGELBERT: One of the intents or the hoped for outcomes was to look at how depth and velocity change with changes in stage. It was not a sediment transport exercise. We're talking river hydraulics, not sedimentation --

JEFF RUNGE: But we're talking about hydrocycling.

PAT ENGELBERT: You asked about that particular study. That's my answer to that study. Now we're talking about this particular study.

JEFF RUNGE: And for this effort, it's about hydrocycling. And if there's a nontrending state that these areas are supposed to be in, I guess if the river is not aggrading or degrading and it's in some level of quasi equilibrium, I guess why couldn't you apply these same one-dimensional and two-dimensional methods as developed in a stage change study towards a similar effort that looks at hydrocycling?

PAT ENGELBERT: As Dr. Lewis alluded to earlier, we're trying to address the concern of sediment and morphology, and we feel that effective discharge in this scenario is best suited to do

that.

JEFF RUNGE: But you don't necessarily have to evaluate both together, you could couple those effects and tease out what are the effects of hydrocycling versus what are the effects of sediment. And if we do that, I still would think that you could apply these same methods to just look at -- evaluate hydrocycling impacts.

GARY LEWIS: Your question two questions ago was if you've learned that the system is in equilibrium, why can't you apply these methods. My answer would be why would you? You've resolved the question that is facing the relicensing agency. We have -- you know, the Project has not impacted the morphology. And you're looking for more and more research that I don't think the District should be burdened with.

This understanding would be fantastic, and I think everybody around the table would love to see this sort of information. But the study -- and I wasn't -- I'm not real familiar with what HDR is doing on the other study, that's before I rejoined HDR -- but as Pat answered, that is a hydraulic study strictly of the parameters of velocity and depth those certain things when a certain stage

occurs in the river. It has nothing to do with sediment transport.

So down in the Lower Platte area, effective discharge gives us the answer to the issues for relicensing. What more does it add, except research that folks may want to know, to the question on the table? I just don't think we need to go beyond the question on the table.

JEFF RUNGE: One thing is that if we can demonstrate that the Loup Project doesn't affect river morphology, there can still be direct effects to habitat due to variations in flow. And that's what I'm trying to address here, is not the effects to morphology, but the direct flow related impacts to habitat for the pallid sturgeon.

GARY LEWIS: The method being proposed for the stage change study doesn't provide that tool. That tool does not exist. I agree, it's a good question all of us are interested in, but we do not have the technology to go to the extent that you're asking.

JEFF RUNGE: I guess I'm at a loss here. What does the stage change study address if it doesn't address flow related impacts to pallid sturgeon habitat?

PAT ENGELBERT: I suggest that Jeff and I have a side conversation and talk about the purposes of the stage change study so that we can move on with meeting our objective of the hydrocycling study.

STEPHANIE WHITE: Bob has some comments. Go ahead, Bob.

ROBERT HARMS: And this might be a question for you, Matt. How did you select the segment of the Missouri River below Gavins Point Dam as a comparison to the lower Platte? What I'm talking about are the two associated activities.

MATT PILLARD: It's based on our understanding that there are pallid sturgeon in the Missouri River below Gavins Point Dam, and they do perform a pulsing cycling scenario when they need to. I think they've done one already this year.

And so that's why we selected that reach, because we know that the pallid sturgeon exists in that kind of habitat. And the point was to look at what they do on the Missouri River, why they do it, and how does that affect the pallid sturgeon.

And then similarly, looking at Loup's operations, what's different, what are differences and what's similar to see if there are any -- any

comparisons we can draw between those two activities and the effects of the Missouri operations on the pallid to try to draw any conclusions relative to the effects of the pallid relative to Loup's operations on the Platte River.

ROBERT HARMS: Let me ask you this. Why didn't you select the stretch of the Missouri River below Fort Randall?

MATT PILLARD: We sure could. We could also select portions of the Yellowstone River where the pallid exist. We want to look at where there's similarities. If the river systems are -- the pallid probably exist in a range of different scenarios. That's -- I'm not a pallid expert. I'm guessing. If it exists in the Missouri, that is a different system than the Platte. And if it exists below Fort Randall, that's probably different than below Gavins Point, and so on.

The intent here is to look at what are these different ranges of the pallid and what are the differences and similarities of the operations, and can you draw any conclusions, then, to what Loup is doing and what are those conditions as a result of Loup's operations on the Platte River.

ROBERT HARMS: The reason why I'm

asking this is when I was with the other team of folks working on the emergent sandbar habitat issues and trying to quantify the -- and replicate, actually, the acreage goals that were set, one of the things that we did was try to look at each of the river segments and say, What should the goals be on the Gavins Point segment, what should they be below Fort Randall, what should they be up in -- like up in North Dakota area.

One of the challenges that we had was we needed to recognize that each of those segments of the Missouri River were very different. And in particular, the sandbars below the Gavins Point Dam segment are different shaped. They're a lot steeper than they are at the Fort Randall segment because of the daily pulsing, so that you end up with a very, very flat slope below Fort Randall. Because it's -- the river's up -- oh, gosh, it could be 2 feet, it varies, you know, up, down. Every day that goes up and down.

Below Gavins Point, they do every three days to discourage birds from nesting. But the bars there -- and a lot of them are manmade -- are steeper, and so you might want to think about using the Fort Randall reach as maybe a better

comparison. I wouldn't use Yellowstone, it's much more gravelly. It's different. But that might be a better --

STEPHANIE WHITE: All right. So I think Bob's suggestion was instead of Gavins Point Dam, that we use Fort Randall for a comparison, is that what I heard?

ROBERT HARMS: Yeah, it's a suggestion. But really what you'll find is there's a lot -- depending on the time of the day, you go from a tremendous amount of nesting habitat to hardly any because the river goes up a little bit, just a little bit. Whereas at the Gavins Point reach, because the sandbars are steeper, the river can go up quite a bit and that same amount of habitat is still there, so --

STEPHANIE WHITE: So we have these two activities with the potential tweaked locations, based on the work you've done.

MATT PILLARD: Actually, I think it's the first bullet. We were talking terns and plovers. The second bullet is really the same types of comparisons but focusing on pallid, but the same kind of methodology for both. It may be different locations for different species, I think that's what

Bob was getting to.

STEPHANIE WHITE: So a discussion of location, which can be modified, I heard you say that, Matt. We can be amenable to that.

MATT PILLARD: I would still be open to leave it open to even other locations. I think Fort Randall is an obvious choice, but I would still leave it open as we look into some other potential -- maybe there's some other locations too that still have some validity. Maybe below Gavins Point has some validity in some regard, but we can look at more than one system. Fort Randall is definitely a choice of preference.

STEPHANIE WHITE: Okay. We did not reach any conclusion on the inclusion or exclusion of the two-dimensional model. It does sound like we're beginning to reach consensus on the existing two activities as they relate to Objective No. 4, with the understanding that the locations of the research can be subject to change to where it's most appropriate.

Are you ready to vote on this and move on? And the red card is already ready, and is it because of this?

JEFF RUNGE: It depends. If it's

about Objective 1, the red card; if it's about ready to move on, I choose green.

STEPHANIE WHITE: It's about Objective 4.

JEFF RUNGE: Objective 4, okay.

STEPHANIE WHITE: Which we have already agreed to, so it's really not about the objective, it's about the activities associated with Objective 4, but with the understanding that this one has not -- we've not reached consensus on it. This is not in at this point.

Based on what is in, can we reach some consensus? Let's see a show of cards.

JEFF RUNGE: I'm watching Rick.

FRANK ALBRECHT: Repeat which one didn't have consensus.

STEPHANIE WHITE: Here, I'll show you. This one does not have consensus yet. On the ones that do, those two bullets there, with some adjustments on the location of study, whether it's exactly Fort Randall or something else.

GEORGE WALDOW: Stephanie, could we say some addition -- keep what's in there, but Fort Randall or others would be added.

STEPHANIE WHITE: Okay. Does that

make it more clear, Frank?

FRANK ALBRECHT: Yes. Thank you.

RICHARD HOLLAND: I don't have a problem with these two activities relative to the objective. I have a desire for an additional activity, but I'm not sure if it's the time -- if it's appropriate.

I mean, my -- I'm getting back to some hybrid between the effective discharge analysis that George was talking about in terms of between these areas and addressing the erosional capabilities of -- the erosional potential on sandbar habitats. I'm just not sure where to go with that.

I mean, it's one of those things where I think you're not truly addressing Objective 4 just by doing what you're -- I mean, you're addressing it in kind of a qualitative -- Well, we'll just kind of look at whatever has been done in those two areas and kind of, through professional judgment, say that it may or may not be having an impact. That's a limited assessment of potential effects.

I don't know if it's even possible to use the effective or -- what's the term -- effective discharge and coupling it with some type of an empirical study to get some rough quantitative or

even semi qualitative estimate of potential impact. But I think ultimately, that's where we've got to go.

I'm just not sure, Neal, how that fits in with this FERC relicensing. Because I -- from a science standpoint, I think this could be a very big deal, and it could be a little complicated analysis. It could take quite a bit of time and effort. But I'm not a hydrologist, I'm not a geomorphologist. I'm not even a bird biologist. So I'm just not sure -- I think that's where we need to go to see how things are potentially affecting it from that, but I'm not sure how to address it here. That's the only reason I'm putting a yellow forward.

So I don't know, Dave, can you help me here, or is this something best addressed through agency comment to FERC, kind of a side that these are our concerns, or -- you know, what I'm saying? I don't know we can sit here at the table and map out a study plan to address this kind of thing very quickly or easily to make a good proponent of it without maybe side-railing everything for a long time. I don't necessarily want to do that. I want to move on. I want to go home tonight.

But I'm just trying to put forward my

concerns. When I read that objective, To identify material differences in potential effects on habitat, I see that inundation is one aspect, and I see erosion of the habitat as a second aspect, and I don't know how to do that. Help me out, George. Dave?

DAVID TURNER: As far as relevancy to the Project, as long as we're designing the study to answer the question of what's the Project's effect on that aspect, yeah, it's relevant, and it needs to be included and considered in this approach. Whether or not the technology exists to undertake your efforts, I'm not the expert here to decide. So we're going to have to go back and figure out how to come up with decisions to these disagreements, and then fall back on some other folks to better do that.

But now's the time to figure these discussions out and get it included here because we're coming to a close. Because we're going to issue our determination, and they're going to go forward and do this effort.

So I'm not sure if I've answered your question or not. But if it's relevant to discerning the Project effects, it's relevant to the

relicensing. You're going to need to articulate what you want them to do and how it differs from what they're proposing to do, and make your case, and we'll decide.

STEPHANIE WHITE: George?

GEORGE WALDOW: I understand the frustration of wanting something to get comfort or to get resolution, but I can only go back -- I can tell you this. All these people here have spent months trying to come up with a solution to address these issues, and we've given it our best shot.

We brought Gary on board early in the process because of his expertise on the river and with this particular subject, and you've heard what he has to say. Multiple times he's come forth and said the hydrology is the habitat -- or morphology is the habitat, excuse me, and the habitat is the morphology. And generally, I get nods around the table when I hear that.

We've given this our best shot. We've come up with what we, as a collective group, believe will get the best answers to these questions. But the study request process is up on the board here, and the field is open for Jeff or any one of you to come up with a different proposal to address these

issues.

We're flat out of ideas. We've given it our best shot, and the clock is getting shorter. And you know, if you guys -- anybody can find a better way, we'll be happy to entertain it, but we don't know a better way. So that's all I can offer.

STEPHANIE WHITE: I understand the benefit of collaborative minds working together to solve a problem. I also understand that it could take us the rest of the day to solve this one. So I wonder if this is a case -- I think there are probably two ways to proceed, either we all go back to our desks and write up individual proposals, or maybe four minds need to sit down and brainstorm with each other about another alternative approach, or to really get to the question if there is a better approach.

But I would like to move off of this one right now, if that's okay. So we can note your yellow on what's on the board, or we can call a revote.

All right. So we have consensus on greens, I guess, with these -- the addition of sites for studying the activities. And then there is this question on the table, which we will all continue to

think about, which is how to address erosional potential on sandbar habitat, and those were your words.

Let's move into the last study, which is PCB sampling. Let me get to it. This last study is 13, PCB Sampling at the Settling Basin. It is a new study plan that none of you have seen before. It is a direct response to the SD-2.

John Bender, have you joined us on the phone?

JOHN BENDER: Yes, I have.

STEPHANIE WHITE: Kim, are you with us?

KIM NGUYEN: I'm here.

STEPHANIE WHITE: Great. So just to be sure, we have Kim Nguyen and John Bender on the phone. Do we have anybody else?

Okay. We're going to go through PCB Sampling. Who would you like to present this, Lisa?

KIM NGUYEN: I'm sorry, Stephanie. John who are you with?

JOHN BENDER: Department of Environmental Quality.

STEPHANIE WHITE: The question was

John Bender, who is he with. He said the Department of Environmental Quality.

So we have two folks on the phone.

This is Study Plan 13, we're on Slide 55. And it's in -- as I mentioned, it's a direct response to SD-2.

This is a quote out of the document on Page 12, The potential exists for dredging operations to mobilize PCB-laden sediments, if present, in the settling base. In addition, small fish discharged onto the North Sand Management Area with sediments during dredging activity could potentially contain PCBs. Such fish could be ingested by federally listed least terns nesting and feeding on the North Sand Management Area.

That's kind of the precursor, or that's kind of the introduction on why we are proposing a new study right now. The goals -- who would you like to walk through this? We'll do it in totality. George? Go ahead, George.

GEORGE WALDOW: We did depart from -- you'll notice from our previous study by quoting that language from SD-2, we departed from our previous approach. And because this was a new -- a new version of a study that had been suggested

earlier and it's somewhat morphed into a -- rather than a general concern regarding fish tissue in the Tailrace Canal, it now has taken on a focus in the upstream reaches of the Project, with specific respect to potential impacts on the terns and plovers.

So the goals that we've come up with is -- it's really a two-part goal. The first is to study to determine if PCBs are present in the settling basin or in small fish dredged from the settling basin.

And the second part of it would be if PCBs are detected in small fish, determine the potential effect on the interior least terns. And that -- it's not stated there, but it basically reflects on the localized tern nesting in the North Sand Management Area. So let's go to the objectives. We'll go through these and then come back to the goals.

Objective 1 is to determine if there are PCBs present in the settling basin. And this goes directly to the concerns that were specified. And we're taking a multi-pronged approach, if you will. We're suggesting that we perform water sampling at the settling basin inlet where the water pumps from

the Loup River, and also at the outlet, or the skimming weir, where it leaves the settling basin. The basis for doing that is to get a measurement of is the water somehow picking up PCBs in transit, or is there a difference in what's coming in versus what's going out.

And that needs to be looked at during the dredging operation and also when the dredge is not in operation. And the purpose of that is because the dredge potentially could be the device that's mobilizing this material from the bottom of the settling basin.

And Objective 2 would be -- this goes not to the water itself, but to the fish, which would be the potential vector between PCBs, if present in the settling basin, and then consumption by the terns and plovers.

So we want to determine if the fish discharged on the North Sand Management Area contain PCBs. And the way to do that is to collect the sampling of the fish from the dredge discharge pipe, knowing that the birds do feed where those dredge -- that dredge water is discharged on the sand management pile, and to take a test sample, limiting it to the small fish of the size that these birds

consume. And I've been saying terns and plovers, but we know it's really the terns that are the fish consumers.

Objective 3, if PCBs are detected in these fish, then we need to determine what the potential of that concentration might be in the birds, and we will accomplish that by reviewing literature on toxicity related to least terns.

So those are the three objectives. I guess now we can go back, and I'll turn it over to Stephanie to discuss the goal.

STEPHANIE WHITE: This is a goal you haven't ever seen before, so let's have some discussion on this goal -- two goals.

The first goal is Goal 1, To determine if PCBs are present in the settling basin or small fish dredged from the settling basin. And two, if PCBs are detected in small fish, determine the potential effect on the interior least tern.

Are those the appropriate goals for the PCB sampling in the settling basin study, Study 13? Mary?

MARY BOMBERGER BROWN: Do we want to consider whether the PCBs actually are -- have made their way into the terns themselves?

GEORGE WALDOW: No.

MARY BOMBERGER BROWN: And why not? Because that is the ultimate issue.

GEORGE WALDOW: The reason is this. The terns are mobile. They don't feed exclusively on the sand management area, they feed on the river upstream, and we don't know where else they may have been in their transit. So we consider this to be -- we need a -- we need a vector between the Project and its operations and the ultimate recipient, which could be the terns. And without a vector, there can be no proof that they acquired the contamination from the Project.

MARY BOMBERGER BROWN: Okay. So if you did want to look for it in the terns, you would want to look for it in the birds of the year, you wouldn't want to look for it in adults. You would want to look at it in eggshell fragments of the young birds.

GEORGE WALDOW: We thought about that also, but the -- as soon as the young hatch and they're fed by the adults, then it would be within their system, or it could be in their eggshells from the adults feeding prior to --

MARY BOMBERGER BROWN: The eggshell

would be reflective of what the female was feeding.

GEORGE WALDOW: That's correct. And you can't exclusively say that the female was only feeding within the Project boundary, so that's our rationale.

MARY BOMBERGER BROWN: Okay.

STEPHANIE WHITE: Dave?

DAVE TUNINK: I guess I've got a question for John Bender. John, when's the last time fish were sampled in the settling basin? Second, are PCBs water soluble, or are they only found in sediment?

STEPHANIE WHITE: Just a second, John, I'm going to rearrange the sound equipment.

GEORGE WALDOW: While that's happening, I'd like to explain that our -- when I say we're sampling the water column, we understand that the PCBs are in the fine sediments, which are in that column. And our sampling protocols would be to sample immediately downstream of the intake gates where the water contains sediment.

And the same is true on the exit weir, our sand pull would come from the downstream side of the skimming, so we'd have a fully mixed sample rather than trying to sample at various elevations.

STEPHANIE WHITE: John, did you hear that?

JOHN BENDER: Yes.

STEPHANIE WHITE: Hold on one second.

LISA RICHARDSON: We've got to get you a voice, John.

STEPHANIE WHITE: Okay. Try that now.

JOHN BENDER: The last time we were up there was five years ago and (inaudible) below the highway was supposed to be representative of the Tailrace up to the highway area. And so our best guess -- well, our educated guess is that fish may have been (inaudible) the Platte River over the Tailrace (inaudible).

But nonetheless, we have never sampled, to my knowledge above (inaudible). But we do have several stations that we've monitored in the Loup, and those have all come clean above the intake there at the Genoa. So we're going to be back, and we're going to be redoing that one station.

STEPHANIE WHITE: Did he answer your question, Dave?

DAVE TUNINK: I couldn't hear the first part.

JOHN BENDER: Okay. And I think Dave had another question as to (inaudible) --

LISA RICHARDSON: Hey, John, we didn't quite have our sound equipment set up right at the beginning. Can you start at the beginning?

STEPHANIE WHITE: Just one second. I have the volume maxed so I don't want any one of you to talk into that microphone until John is done.

Okay, John.

JOHN BENDER: What do you want to hear now?

STEPHANIE WHITE: Start over.

JOHN BENDER: Oh, yeah. (Inaudible) station was Tailrace portion below the Columbus powerhouse. We sampled several others on the Loup River above where the diversion is (inaudible) clean. We have never sampled in the canal in the diversion and Lake Babcock, and to my knowledge (inaudible). But it is a possibility we could add a station (inaudible) look at the canal system somewhere -- diversion (inaudible) and Lake Babcock further downstream than what you guys are talking about (inaudible).

And to answer Dave's --(inaudible) they're generally considered (inaudible) in the sediment.

They're not readily picked up (inaudible) consult with USGS on those methodologies.

STEPHANIE WHITE: Did I hear you say that it would have to be through a consultation with the USGS on those methodologies?

JOHN BENDER: It wouldn't have to (inaudible). Because getting that detection level that's meaningful, water column sample, is going to take some special (inaudible). We are not capable (inaudible).

STEPHANIE WHITE: I'm sorry, you are not capable of -- what was that last part?

JOHN BENDER: (Inaudible) detection level.

STEPHANIE WHITE: We caught detection level but not the other part of it.

JOHN BENDER: It's a really, really low level of detection in the sampling protocol that you have to utilize.

RICHARD HOLLAND: I think he's saying that the DEQ doesn't have the capabilities of doing that kind of detection work.

JOHN BENDER: Right, Rick.

RICHARD HOLLAND: I'd like to make a comment. He said he hadn't been sampling the canal

above Lake Babcock. Based on our sampling in the middle Loup, the Sherman Feeder Canal, we sampled in that canal with the same techniques we did in the middle Loup and the Loup River.

I would suggest that most of these diversions will pass whatever fish are in the river into the canal, and so the possibility is that they're going to be there.

That's -- I'm not saying that -- other than that, more than likely if -- when you divert the water into the canal, you're diverting whatever's in the water and the fish are going to be there, so --

JOHN BENDER: I agree with you, Rick. And like I said earlier, we have sampled up the Loup, and all those samples are clean. We have no detects of PCBs up there.

STEPHANIE WHITE: He said we have no detects of PCBs up there.

RICHARD HOLLAND: In the Loup.

JOHN BENDER: That's why I speculate the impairment we see in the canal below Columbus Powerhouse is probably something coming up from the Platte River, fish that (inaudible) Platte River and then migrated up.

GEORGE WALDOW: We agree with you, John. But the request came as part of -- from the commission, commission staff, and we responded to it with a sampling plan, and we frankly don't expect to find anything.

JOHN BENDER: And I -- we'll see what happens.

DAVID TURNER: Let me just respond to that. It's not that we made a request for a study, it was that somebody raised an issue about PCB levels and the effect that the Project may be having on PCB levels, and in particular, on the least tern.

The only way that we could envision that the Project was having that effect was through the dredging operations in the settling basin. That doesn't necessarily mean if there was data available to suggest that the Loup isn't contaminated, and recognizing that this is an annual operation, that with those changes occurring every year, that's new sediments coming in and being pushed out up in the Sand Management Area.

So it's not -- that's the only place that the Project is going to have an effect that we could actually put our hands on. If there's data suggesting that there isn't any PCB levels coming in

on an annual basis, then there's no reason why that -- we couldn't use that data to dispel the issue without having to collect that data.

GEORGE WALDOW: We would be happy to withdraw the study and provide you with the data on the Loup River.

JOHN BENDER: George -- and this is John Bender.

And I don't know that it's going to be that (inaudible) other than the water column sampling that you want to do, that's going to be a technical challenge. But it's grabbing fish out of the dredge and putting them into the (inaudible) and doing the fish tissue analysis.

I would suggest, however, though, that those small fish that the terns utilize are not long-lived enough to pick up PCBs. What we're finding them in are target species of bottom feeder, usually carp, sometimes the catfish, that's about 14 to 16 inches long. That means it's at least two years old, probably older, and it's been around for a while, and it's been subject to those long enough that they are accumulating in their fat tissues.

GEORGE WALDOW: And we don't disagree at all. Our in-house expertise tells us that

there's -- a small fish less than 2 inches long does not have time to bioaccumulate significant PCB contamination.

JOHN BENDER: That's what I'm saying.

STEPHANIE WHITE: So have I heard we need to withdraw Study 13? No? Bob, do you want to talk? Go ahead, Mary.

MARY BOMBERGER BROWN: I'm wondering if the plovers can be used to address the issue of PCBs. They probe into subsurface invertebrates, insect stuff, things that would come up with the dredge and with the subsurface water and would be fed by probing. Could the presence of PCBs in the soils and the subsurface invertebrates that they eat and in the tissues of the birds of the year be used to address this question, if we are concerned that the birds fly too and so we can't trust what fish they're eating? Can the plovers be used in an indirect way to address this issue?

JOHN BENDER: Mary, how would you sample that?

STEPHANIE WHITE: The question was, Mary, how would you sample that?

MARY BOMBERGER BROWN: Well, you would need to take eggshells from the plovers,

tissues from the young birds themselves. I don't think you can take blood, they're very small. I am uncertain whether you could take sufficient blood to do that.

DAVE TUNINK: Fatty tissue.

MARY BOMBERGER BROWN: Is it in fatty tissue? I don't know, we'd have to think about that. Is it in fatty tissue? Could it be extracted from the subsurface invertebrates? Does anyone know?

GEORGE WALDOW: We had a discussion of that.

MARY BOMBERGER BROWN: This is just -- I'm thinking out loud.

GEORGE WALDOW: PCBs aren't known to accumulate in invertebrates. The other problem we would have with that is the plovers are just as mobile as the terns and migrate great distances and could have accumulated this material any way. There's got to be a vector.

MARY BOMBERGER BROWN: Not the young ones, not the birds of the year. So it would need to be addressed in the birds of the year that are feeding themselves that have not left the sand pile. Those would be the ones -- if there was going to be

someone to look at, that would be who it would be.

GEORGE WALDOW: I don't see how that's any different than using terns?

DAVID TURNER: It also goes to a question of so what? I mean, what are we going to do if we find out that they are consuming PCBs? To what end does that take us?

One, I've heard that there really isn't any evidence to suggest that there are PCBs up above the Loup. This is an annual change. Everything that George has said means we can't actually sample these birds to recognize -- to extract a Project effect from that, unless you look at the young. And I'm not sure they would have had time to accumulate anything of real value in that anyway. And then again, to what end do you take that data?

But we didn't raise the question, somebody else did. So if there was data needs from Fish and Wildlife Service or you guys, you're going to need to make a case for it.

ROBERT HARMS: Yeah, Fish and Wildlife Service raised the issue here. And one of the things that we learned during the course of the description of the Project that's described early on in the site visit was that activities do occur along

the canal and at Lake North.

The erosion occurs. Just the sediment flushing in, as you had described, led us to think about the potential for PCBs in the canal system, possibly Lake North, possibly Lake Babcock, and that's why we put this into our -- in our letter here that we sent a while back.

Given that, I have a couple of questions. I'm not sure who I should address those to. But the plan is to determine if PCBs are present in the settling basin. Given that activities go on, as part of the Project, in the canal, why isn't the canal being included as a place to be surveyed as well, sampled as well?

GEORGE WALDOW: Because the expressed concern was -- if I remember the discussion properly -- we originally were talking about fillet samples that were taken in the Tailrace Canal, as John mentioned, and that the concentrations were not -- were not considered very serious with respect to human consumption. They were getting -- correct me if I'm wrong, John -- but I think you said they were getting less and less -- there were some nondetects. But the issue arose relative to the terns eating fish that were dredged onto the sand

pile, and that's what drove this study design.

ROBERT HARMS: One of the items that we included in our letter that kind of seems to vary with that is the total PCBs in three samples were above the 110 micrograms per kilogram guideline. A lot of these standards are for human health and not necessarily for wildlife.

The other question that I have here is the sampling in the settling basin is only -- and you may have touched on this already, George, or somebody -- this only speaks to water sampling. Was sediment a part of that, or did I miss that?

GEORGE WALDOW: It was -- and I wasn't the person that did it. We had one of our environmental staff put the plan together. But basically, his judgment, from having done it before, is to take a proportional sample of the water because of the reference to mobilization and transport within the system.

And so the mobilization would be the dredging activity, reportedly, anyway. If the dredge wasn't operating, there wouldn't be mobilization, there would almost be demobilization as material settled in the settling basin.

But the thinking is that the material that

settles on the bottom is -- the heavier material settles near the upstream end, and it gets progressively finer as you go the 2-mile length. What comes out and continues on down the canal are the fines, the clays, the organics, and that's typically where the PCBs adhere. They don't glom onto sand granules or gravel. And so that was the thinking, that this material is still in suspension in the water column, and that's why we were proposing that we'd sample from the column.

RICHARD HOLLAND: So the analysis is really sampling the suspended component in the water sample, not the water itself?

GEORGE WALDOW: They would decant it and accumulate the sample. In fact, the sampler itself would be set up to do so on a 24-hour basis.

FRANK ALBRECHT: My question was -- I don't know if we hit it last time -- Jeff, does anyone remember when the NAWQA study was going on, did they go into the canal or the bypass reach when they were doing -- they had a fish sampling component, and I believe they were looking at a lot of different contaminants and I just can't recall if we covered that last time. John, do you know? Can you hear that?

JOHN BENDER: No, I'm not sure.

FRANK ALBRECHT: Do you know which study I'm talking about, though?

JOHN BENDER: (Inaudible).

STEPHANIE WHITE: Can you repeat, please?

JOHN BENDER: I don't believe NAWQA ever sampled within the canal system. You can clarify that with USGS.

RICHARD HOLLAND: Ron Zelt would be the person to talk to.

ROBERT HARMS: I have here some sampling of PCBs, 12 samples of carp from the Loup River Canal -- I'm not sure where that is, which segment -- and then some discussion about evaluation of the 12 samples. So somebody has done some sampling at some point in time.

JOHN BENDER: That would have been us, Bob. That was downstream of the Columbus Powerhouse.

ROBERT HARMS: Is that the Tailrace area that you're talking about?

JOHN BENDER: Yes, the Tailrace.

ROBERT HARMS: But nothing in between? So there's some in the Tailrace, but very

little sampling in the canal, then?

JOHN BENDER: Not from us.

ROBERT HARMS: Okay. Thanks.

JOHN BENDER: What I said earlier was that we have kicked around the idea of visiting the canal. That's a problematic sampling area logistically. You've either got a big boat with booms, which I don't think we can launch on the canal, or we usually do it by wading, which I don't think we can do in the canal. But it -- it's a tough one to set up.

STEPHANIE WHITE: Other discussions?

QUINN DAMGAARD: This is Quinn Damgaard.

I just want to mention, in the proposed study plan, we originally did not propose a PCB study, and that may be getting lost in the mix. And David, I'd like your opinion here.

The proposed study plan and SD-2 kind of missed each other in the mail, I think. I don't think FERC had the opportunity to review our response on the water quality -- the PCB issues raised by Fish and Wildlife before producing the comments in SD-2 related to the PCBs in the settling basin and the least tern.

John, please pipe in here, but I did converse with John Bender when producing the response here. And I think it -- it is the district's position and the DEQ's position that sampling for PCBs is perhaps not necessary at all, and potentially adverse if we're stirring up sediment, for which I guess all the samples today upstream are looking good.

And Bob did mention the 110 micrograms per liter. All of those samples were recorded in '94. There have been several sampling periods since then, '98, '99, '04 and '05, and none of them have exceeded that limit. The trend is a downward trend in concentration.

The DEQ will be out again this year, 2009, sampling. And I guess in the proposed study plan, our thought was let's see what that shows, again, sampling fish tissue at the Highway 30 bridge in the Tailrace. Potentially it could be a nondetect, and this could be a nonissue that would come off the consumption advisory list and I guess that would be that.

John, do you have anything to add to that, or -- I apologize for speaking for you if it wasn't accurate.

JOHN BENDER: I guess what the study does is (inaudible) basically put the issue to bed. My thought on that is (inaudible) don't have a lot of exposure time. We're not -- it (inaudible) nondetect level, therefore of no consequence. But that would be very easy to conduct.

The water quality stuff, on the other hand, that's proposed is, again (inaudible) water quality (inaudible) that I'm looking at right here is 2 micrograms per liter for an acute level; .007 for (inaudible). So we're talking in the nanograms per liter level (inaudible).

DAVID TURNER: I didn't pick up on all that John was saying, as a matter of fact, very little of it.

But it is true that we put that SD-2 out in terms of there's been new information that has been made clear since that came in. Having said that, it is still an issue in SD-2 that we'll need to look at in the EA that somebody has raised. I don't think anybody is extracting that as an issue.

But having said that, I think the analysis could be very simple and reflect pretty much what you just said without having to go out and actually collect additional data on fish sampling.

Having said that, I'm open to suggestions from the other folks, if it raises concern whether or not we need to do this. It seems like a reasonable approach, but it may be overkill.

ROBERT HARMS: Well, from Fish and Wildlife Service perspective, we're still of the mind that we would like to see the sampling done on the sediments in the canal, the settling basin, basically laid out in our recommendation that we had made in our February letter, is kind of what our position would be then. And when we prepare our comments for the next go-around, it's not likely they'll change.

DAVE TUNINK: If DEQ is going to be sampling below the Tailrace, they could easily go into Lake North, Lake Babcock and take samples of fish that are above the Columbus Powerhouse.

STEPHANIE WHITE: Go ahead, Jeff --

JOHN BENDER: And I can kick that around. (Inaudible) I don't know if we can obtain extra analysis samples from EPA (inaudible).

STEPHANIE WHITE: Dave?

DAVE TUNINK: What John is trying to say is DEQ is limited to how many samples they can send in for analysis, so he may be maxed out and he

doesn't know if he can cover that.

STEPHANIE WHITE: Jeff, do you have a comment?

JEFF RUNGE: Yeah. I've read our comment letter, and there's just way too much text in our comment letter. I guess I'll try to simplify things here.

PCB contaminated fish were identified in the Project area. And the Project -- or the fish may have come from the lower Platte River. We actually don't really know the source of the PCBs.

And then I guess our ultimate concern is are there -- is there a potential for PCBs being locked into sediment within the District boundaries that may be dislodged through canal maintenance activities? And if that's true, if there is that potential, is there anything that can be done about it?

And I think if the answers to those two questions you have, first, No. 1, no, then No. 2, no, then really there's no need to do any further work. But for us, I think it's just to have that peace of mind, to go in, take sediment samples to ensure that canal dredging or maintenance operations doesn't dislodge some source of sediment that's

locked in and hidden.

JOHN BENDER: Was that Jeff?

STEPHANIE WHITE: Yes, it was. Are you going to speak, John?

JOHN BENDER: Yes.

STEPHANIE WHITE: Okay. Let me turn the volume on.

JOHN BENDER: One other possibility that was brought up (inaudible) if you look at industrialized areas of Columbus, dealing with Behlen Manufacturing, Behlen Electronic, all those other facilities, there are drains that go into that portion of the canal. And it is not out of the question they may have used PCBs in their transformer and cooling oils back in the '70s when it was still legal.

RON ZIOLA: The comment was basically about the industrial area from Highway 30 on down with the various industries, there may have had a product that had PCB in it that may have came in through the drains. Because the canal is used for local area drainage, so there is that possibility.

STEPHANIE WHITE: So if I get back to, Jeff, your point, which was you'd like to see some sediment tested, that's what I heard.

JEFF RUNGE: Not necessarily. I guess the first question is could there be the potential for PCBs, some hidden source of PCBs to be within the sediment within the Project boundaries?

And if -- and I think this is a big if -- if there would ever be the chance for canal maintenance or dredging or those types of activities to dislodge that, and if that's the case, then second of all, if there is anything that we can do about that if we do find that there is a hidden source.

And I think, to answer those two questions, for me -- and I'm not sure about the severity of the issue, but just to have that piece of mind to conduct that settlement sampling, if there is that risk present -- but then again, that's -- I'm not completely familiar with the system, I'm not completely familiar with the maintenance operations, and I'm not completely familiar with the level of risk of having PCBs in sediment. And so that's why I'd like to defer to Loup and to Bender.

GEORGE WALDOW: This is George Waldow.

I appreciate what you're saying, Jeff, and

I think -- let me explain a little bit about the dredging operation.

The dredge on this Project is captive of the settling basin. The only time it was ever out of there since it was new is in the flood of 1966 when it got deposited up on the bank. So the only place that dredge ever works is in the settling basin, and the -- there's been talk from time to time that they were going to try to dredge out Lake Babcock. They chose instead to build Lake North. And there's no plan to do any -- and speak up Neal or Ron, if I'm wrong -- but there's no plans to do any dredging of the reservoirs in the future.

And I would expect that if there was a plan to dredge it, that a permit would be required and sampling could be done at that time. So I think that there just is no -- there's no indicator that there's been a problem within the system. There's no record of any spills that have occurred.

John, if you could find your way to take some fish samples upstream of Columbus Powerhouse, I think Neal might be willing to pay to have them analyzed and maybe we could put this whole thing to rest.

JOHN BENDER: I will run that by our

guys, if there's some way we can do that. I didn't hear Neal chime in. Was that a yes there?

GEORGE WALDOW: He's nodding his head.

RICHARD HOLLAND: He said a wholehearted yes from his deep pockets.

JOHN BENDER: And the other thing I would add, that at anytime anybody wants to do dredging, (inaudible) Corps of Engineers in regard to this one. If we have an (inaudible) with PCBs (inaudible) pollutants, it would require a set of tests (inaudible) dredge itself before they can discharge and make sure it's clean. Now, we have (inaudible) because it is subject (inaudible) we were able to put (inaudible).

JEFF RUNGE: I appreciate the answers from everybody, and I wish I could provide a Fish and Wildlife Service response, but there's one more person we need to talk to and he's not here right now. So we'll get back to everybody on that. But I think this really helps to clarify things.

STEPHANIE WHITE: I wonder if, contingent upon that -- whatever it is you need to do back at the office -- I wonder if maybe the conclusion we have come to is that this study as

proposed isn't necessary, rather we might depend on the DEQ to do some additional sampling with some assistance from the District to get that processed. It sounds like that's the consensus of those sitting around the table today.

ROBERT HARMS: Not necessarily. I'd like to keep this in here until we visit with our toxicologist more. So for that reason, I'm going to red card it.

STEPHANIE WHITE: I haven't called for your vote.

DAVE TUNINK: Is that sampling in the settlement basin?

ROBERT HARMS: That's not enough.

DAVE TUNINK: Well, settling basin -- I question sampling there since that is new sediment coming in from the Loup River every year. So I'm not sure if it's going to accumulate any PCBs.

STEPHANIE WHITE: Dave, where should it be, then?

DAVE TUNINK: Well, if it's anywhere, it should be below Monroe, starting from Monroe down if you're going to sample sediments, not in the settling basin.

STEPHANIE WHITE: So the comment is

that the objective change to be below Monroe instead of the settling basin.

GEORGE WALDOW: The problem is going from sampling fish tissue to sampling settlement. It's a whole lot more complex because you're risking turning something loose that might be sequestered. The DEQ samples fish tissue because that's a good indicator, and we would recommend following that protocol.

JEFF RUNGE: And I think we need to table it for now and really not break it down any further. It may be a nonissue here. We'll get back to you.

DAVID TURNER: This is David. I appreciate that, but just be cognizant of some of the things I think Nick and I related back in scoping when we looked at these issues. We're not -- unless we can draw a reasonable nexus to some change that would be occurring or resulting from Project operations, which is what we were talking about here, and that's the reason we included this in SD-2.

There's a direct change or a direct effect that is occurring every year that I guess you could say we would, at the very extreme, say cease and

desist dredging operations, which basically makes the Project go away.

But having said that, I mean, what would they do -- what other events or actions other than what you were talking about before in terms of canal maintenance would be a reasonable nexus to the Project? So my inclination, and from our historical use -- I mean, we'll consider your study requests if you want to continue to put that forward.

But I'm just cautioning you that historically, the commission has not supported that kind of effort unless we can make a direct connection to what we might end up doing with that data in terms of making a change in Project operations to eliminate that problem. And I haven't heard any direct connection to the Project, other than dredging right now, David, that would make us consider doing that kind of sampling.

STEPHANIE WHITE: Rick?

RICHARD HOLLAND: If we -- this whole thing seems to be unraveling. And the reason I'm saying that is when we started this discussion, we talked about the fact that dredging in the settling basin brings up sand and fish with it, and the birds are taking the fish that are coming out of the

settling basin and feeding those to the young and that's potential transfer of PCBs.

If we take the assumption that the sand in the settling basin is essentially fresh sand that's coming in every year and it's -- we have evidence to suggest that it's not contaminated, and we -- moving down the analysis below Monroe essentially decouples it from the feeding of the birds on the fish up in the settling basins, and hence you don't have connectivity, period, and there's no need for the study.

I mean, to me, unless -- unless -- and he didn't pay me a thing to say that, I want you to know that -- I'm just trying to -- as you said, just trying to find the connectivity with the operations. And so I'm not saying PCBs aren't a potential problem somewhere somehow, but the data is looking thinner and thinner as we start connecting the -- how the operational stretch comes across. So I guess I'm concerned about going forward with this study.

ROBERT HARMS: And I recognize that Project operations need to be a part of this, and that's why we said in our letter, drainage of canals -- and I got that from the discussion

from Jim -- they drain canals, and they find cars in the canal that people dumped.

We view that as a part of the Project, a necessary part of the Project. And that's why we -- we included that. You make a good point, and so do you, about needing to tie it to Project operation. We feel that we did, so --

JOHN BENDER: (Inaudible).

STEPHANIE WHITE: His question is when do you need the results? That could be a problem. He sends their stuff into the EPA in Kansas City, and they haven't received their '08 results yet.

So I think there is an -- we've probably come to an impasse in the room. I think there's a set of folks that are willing to exclude this study, and I think there's a set of folks that maintain that it needs to stay in.

My question to this group -- this gathering will not happen again -- is not planned to happen again until -- it's not planned to happen again. So my question to you all is is there value in working through the sediment -- the PCB sampling study plan as it is, as a group? Is there a benefit to this group working through the study plan as is?

ROBERT HARMS: Probably not today. I think that the two sides feel strongly. We feel strongly like this ought to go on, and the other side feels like strongly it shouldn't, or should be modified in some way. I don't know if we can reach some sort of solution. But maybe what we ought to do is put our comments in and let FERC sort it out.

STEPHANIE WHITE: Sure. George?

GEORGE WALDOW: Let me ask, I'm not sure we're that far apart on this, Bob. What -- would you have a problem with sampling fish tissue in the -- above the Columbus Powerhouse to be an indicator?

ROBERT HARMS: Above the Columbus Powerhouse?

GEORGE WALDOW: Upstream of the Columbus Powerhouse. That way that includes the entire canal system. They've already sampled the Tailrace portion, so --

ROBERT HARMS: Well, what we had recommended in our letter was sampling of the sediment where PCBs accumulate. That's what we have recommended. You know, as far as the -- gosh, I have to admit that our toxicologist is not here. We're sort of trying to just do our best to try to

get through this.

But you know, based on what this letter says, sediment is what we're looking at. Maybe a combination would be fine, but I think definitely the sediment is the key thing.

QUINN DAMGAARD: I believe earlier, Jeff said that, you know, he would defer to the District and John Bender. And I think both of us, the District and Mr. Bender, are opposed to sediment sampling.

John, can you confirm that? I think that's what you've portrayed to me during some discussions and during one of the previous agency meetings.

JOHN BENDER: Well, I'm not (inaudible) you're just not going to find this stuff. By bioaccumulation in fish tissue (inaudible) I wouldn't know what level within the sediment poses a risk. It's unreasonable to think that it doesn't (inaudible).

RICHARD HOLLAND: Essentially what he's saying is that first of all, it's going to be very difficult to find in the sediments. And even if you find it in the sediments, there's no action level to compare it to. Is that correct, John?

JOHN BENDER: That's what I'm saying, Rick, yeah.

RICHARD HOLLAND: What the standard -- the standard comparison is to use fish tissue for health reasons, and those are the target levels that everything is based on. So the action level, I'm not sure is the right terminology.

But you can sample the fish, get the level in the fish, and then say whether or not it exceeds or doesn't exceed those target levels, and then you've got -- you can make a statement of risk.

You can't -- you can sample it in the sediment, and you don't know how that level in the sediment, even if you detect it, compares to what's in the tissue. I think that's what the scenario is.

ROBERT HARMS: I think this is a good reason for why Jeff had suggested that we go back and -- we'll keep this on here, and we'll go back and talk to our toxicologist. So our recommendation is the sediment.

JOHN BENDER: We'll take up Neal's offer sampling (inaudible) alternative lab.

STEPHANIE WHITE: I heard him say that he'd take up the District's offer to run additional samples and they may have to send it to

an alternative lab. John?

JOHN SHADLE: I just want to point out, having grown up in this area and this canal has been here for a long, long time -- and David, I think you're right, it has to have some kind of tie to the operation of the Project. And as was pointed out, people drive cars into these canals. Who knows what people do in the middle of the night with regard to disposing of various things.

And I'm not aware of any direct tie that the Project has with PCBs, and so I would be kind of leery about poking around sampling or whatever or not. Somebody mentioned disturbing and setting loose some of these contaminants. I would be a little leery with regard to sediment sampling.

ROBERT HARMS: Wasn't PCBs used for cooling in electrical equipment years ago? I can see a tie there.

JOHN SHADLE: There's the potential for a lot of sources for that. I'm not saying you're going to find any. But again, to tie it back to Project operations, there's a number of different sources. And what you do find, what are you going to do?

STEPHANIE WHITE: Other comments on

this issue? What would you like to do, vote on leaving it in or taking it out?

QUINN DAMGAARD: I guess if this does get tabled, I don't know how it's going to end up. I would recommend that both Fish -- okay, Neal, go ahead.

NEAL SUESS: Right now, the District's going to eliminate it. I'm going to tell you that right now. If Fish and Wildlife -- you know, if you guys want to propose it, that's up to you. We will take John up on his offer, and we will go that way with it.

So I'm in agreement with everybody here, other than, you know, what the Fish and Wildlife folks have said about what's going on and testing the sediment, I don't think it's anything at this point in time. So that's what we're going to do with the study.

We can -- you know, we can sit here and talk for another hour and a half, but I don't think we're going to get anywhere. So I think at this point in time, I suggest we just move forward and go that way with it.

STEPHANIE WHITE: And just so we have a record of it, why don't we take a show of cards

for that. What we're asking for is to vote -- we're suggesting that we will eliminate Study 13.

So green is you're okay eliminating it -- I think that excludes you from voting. Green is you're okay with eliminating it; yellow, you still have some concerns; and red is not at all.

FRANK ALBRECHT: Just for clarification, that's contingent upon DEQ as part of their routine sampling, or --

ANTHONY BYRNE: Right. That's basically DEQ doing fish sampling basically above the Columbus Powerhouse. And we would assist them in doing that sampling and getting the results of that.

STEPHANIE WHITE: Let's call for a vote. Yellow from Jeff, green from John.

QUINN DAMGAARD: In support of Neal's statement, I would refer, again, everybody back to the proposed study plan and our original response there with regards to PCB sampling. Like I said, I think it might have got lost in translation between the revised and SD-2 and everything in between. But I think we're going back to what we had originally produced in the proposed study plan.

STEPHANIE WHITE: Okay. So just two

yellows from Jeff and Bob, otherwise we reached, I believe, consensus in that regard, and we're going to take Study Plan 13 off the table. I will now turn the meeting back over to the two of you for conclusion.

FRANK ALBRECHT: One more clarification, if that's okay.

Neal, if the DEQ sampling comes back with some positives, then we -- then what would be the logical step?

NEAL SUESS: You know, we'd have to take that under advisement right now, Frank.

FRANK ALBRECHT: Okay.

NEAL SUESS: I mean, the big question in that is where the heck did it come from. I mean, and you know, you can say -- and you know, the other part of the problem with the sediment -- and this is something -- I mean, the sediment is coming down the Loup River. It could have come from anywhere in the Loup River. I mean, it could have come from as far away as the Dismal River Golf Club, there might be a golf cart out there that made it's way down here. Who the heck knows at this point in time?

And that's, I guess, the other part of my concern with all of this. And you know, yes, so you

find something, where did it come from, and is the -- is the Project operation affecting it? There's a lot of issues that go along with that.

And I think right now we'll choose to disagree. But yeah, if we find something, then we've got to figure out where to go from there at that point in time.

All right. I'm going to turn it over to Lisa for a little bit.

LISA RICHARDSON: Well, the last thing that we had here was what are our next steps. As I talked about yesterday morning, June 25 is when those agency comments are due, and those need to follow the FERC criteria and address all seven of those criteria so that FERC has the full information that they need to evaluate study requests and additional information that might be needed.

FRANK ALBRECHT: On that deadline on the June 25, comments due on the proposed study plan, are you going to send the changes -- the draft changes that we've made in the last two days, then, are you going to send that back out or post that on the website, by chance, so that we can look at that? My question is comments due on proposed study plan as is? I'm assuming it's with the proposed changes

that we've made in the last two days, correct?

LISA RICHARDSON: Yes, it's with the changes. We will get that out to you faster than we got it out last time.

STEPHANIE WHITE: And I would say we've actually made the changes in the Power Point presentation as we've been going. So that is an alternative. I think we can probably get that out faster than a memo, if that would be helpful to you.

FRANK ALBRECHT: Either way. Because if I missed something on my notes, I mean, I'd like to be able to take a look and review the comments. It could be very helpful. So I would take you up on that. Thank you.

LISA RICHARDSON: Okay. So yeah, that would -- we would hope you'd comment on what we've agreed to do, make any changes that we've had in these last two or three days.

July 27 is when the District will prepare their final -- well, I guess they call it the revised study plan, which incorporates the discussions that we've had and any response we might have to comments that you would submit in June.

Other days up there is July 1. Way back in January or February, we had identified the

April 21 date, these dates, this week, and July 1 as dates to possibly get together and discuss things. July 1 was just the date that we could get to work. That seems like it's probably a little late because it's after the comment period, so I'm not sure that having a meeting that day makes any sense.

But we would like to say that there may be issues, as we go back through our notes and try to make sense of everything these last two days, that we want to discuss with you agencies one on one or a couple of you together. We'd like to do that, if possible, if you guys are amenable to that prospect.

DAVID TURNER: I just want to kind of caution everybody and ask a couple things. When you're preparing your -- when we devised the ILP, it was intended to be in this collaborative process to try to work out and get agreement on the studies. And obviously, we haven't gotten there on everything yet.

When it comes down to the commission having to make a decision on the proposed study plans, it's going to be very important to make clear where those disagreements lie between what's being proposed and what you want to see done. Because what we will -- what we'll end up doing in our study

determination is saying, Here are the plans that we approve, go forth and do them. And here's the -- here's the District's proposed study plan. We're approving this plan with these modifications based on our conclusions from our analysis of the issues proposed by you guys, so to be very clear in where you want and what you want done relative to what they proposed to do.

And as George talked about earlier, to address the criteria, because that's what we gage by. They're guidelines to help us evaluate the relative value of these studies to the Project and what we're going to do with those things. So it's important to do that.

Now, one of the things left off the slide is the ability to respond to the revised study plan. You guys do have an obligation to comment on the proposed study plan reflecting all the discussions we've had over the last couple meetings. We'll put out a revised study plan. You have 15 days from that time period to file with the commission any further disagreements with that revised study plan. Because they're going to take your comments in hand, revise the study plan, maybe, maybe not, but they'll respond to them.

If you're still not satisfied with that, you have 15 days to file with the commission explaining where that disagreement lies. And that's really where the study plan determination of the commission is going to be addressing, it's the differences between what's been proposed and what you're requesting.

Is that clear?

RICHARD HOLLAND: So essentially, we have until August 11 to get comments back to FERC, something like that, 11th or 12th?

DAVID TURNER: Yeah, I'm not sure what that date actually works out to be. It's 15 days after the July 27 date.

STEPHANIE WHITE: And the other thing I heard was there are seven study criteria that need to be addressed, but then there's an eighth piece, which is how what you're all proposing differs from what's in the revised study plan.

DAVID TURNER: That is what they will use when they tell us, We want to see this. And then they'll use those seven criteria to justify that difference. So it's not the eighth component, it's those criteria as it applies to the difference.

STEPHANIE WHITE: Okay.

LISA RICHARDSON: That's all I have. And I hope that we can call you guys, Frank, Bob, Jeff, everybody, when we have questions, and David. We'll get a meeting set up. We'll try to include FERC, and we'll let you know when it is and include you by phone in any way possible.

STEPHANIE WHITE: For the record, I've noted three action items that we talked about as a group. I want to remind you of those before we conclude.

We're going to get some information, Mary, from you about number of fledglings per matched pair. We are going to share with FERC our additional data on fish sampling -- was that right -- fish sampling? And you, David, will then confer with Nick about that.

DAVID TURNER: Yeah.

STEPHANIE WHITE: And those are the only three action items that I caught. Did I miss any?

FRANK ALBRECHT: That was two.

STEPHANIE WHITE: It was get data from Mary, give data to FERC, FERC confirms with Nick. Three.

Okay. That's all I've got.

NEAL SUESS: I guess I just want to take this opportunity to thank everybody for coming the last couple days. I know they've been long, difficult days, and -- get your red card down, Rick.

But I do appreciate the input, as that helps us as we develop the plans that we will submit to FERC, and we'll go that way with it.

So with that, I guess we are adjourned for the day, and we will take it from there. So thanks, everybody.

(Adjournment - 3:39 p.m.)

C E R T I F I C A T E

STATE OF NEBRASKA)
) ss.
COUNTY OF DOUGLAS)

I, Kristin Teel, Registered Professional Reporter, General Notary Public within and for the State of Nebraska, do hereby certify that the foregoing study plan meeting was taken by me in shorthand and thereafter reduced to typewriting by use of Computer-Aided Transcription, and the foregoing two hundred fifty-four (254) pages contain a full, true and correct transcription of all the testimony of said witness, to the best of my ability;

That I am not a kin or in any way associated with any of the parties to said cause of action, or their counsel, and that I am not interested in the event thereof.

IN WITNESS WHEREOF, I hereunto affix my signature and seal this 4 day of June, 2009.

Kristin DeRocher Teel

KRISTIN TEEL, RPR, CSR
GENERAL NOTARY PUBLIC

My Commission Expires: