

Discussions between Project Managers and Science Panel

Following these discussions, the group moved to:

1. Hold a working group meeting of some panelists with the project managers, to discuss adaptive management and monitoring
2. Develop a summary of the individual panelists' scientific opinions. Originally conceived as an updated version of 'document 2', this expanded into a larger set of questions and statements (see questionnaire).

June 7

Courtney: This is an opportunity for feedback between the panel and the persons who are potentially the decision makers, or those who will advise the decision-makers, and for you to record your opinions, to ask questions about the process and other things of interest.

Quinn: I'm curious to know if any of you have changed your views about anything in this process.

Perry: I've certainly learned a lot. We sat down at lunch and put together a list of the issues as we see them. What we'd like to do is step back and look at the process. When we started out, we put together a process, a collective effort on all our parts, to ask, 'How can we ask this panel to help us?' And we envisioned a series of workshops around key issues. I think we were expecting at the time that we would get more specific closure than we've been able to get so far. I have a list of questions I'd like to present (see attached document).

Boesch: What's the basis of your hope for closure? We've been trying to help you by asking the right questions. We have not drawn conclusions for you. So what's the process by which you draw conclusions? We certainly don't know. Maybe we could help you answer those questions.

Perry: I'll speak for myself, but in preparing the BA, we expected scoping. That out of this, we'd get guidance around scoping for the BA, and that would help the regulatory agencies to do the analysis in the BO. That by presenting their information and getting their input, that would help the action and regulatory agencies to find places to work together through the disparities of opinion. I guess I expected that we'd narrow, not widen, the issues.

Boesch: You'd like us to do that.

Perry: That was my vision. I'd like to hear from the other project managers. I guess I thought that was what was going to happen. Instead it seems that often new questions get raised. I'm concerned they're beyond the scope and capability, financial and otherwise, of what we can do.

Courtney: In my mind, the purpose of the panel is to help you identify the best way to do science. And to the extent you've got substantive disagreements that can be discussed, for the

panel to help identify what is the best science. If you don't have a clear decision-making framework, you can't ask the panel to do it for you.

Tortorici: I guess I'm much less concerned about this issue than I was when we started. I believe we all had a hope that things were going to be more black and white than they turned out to be. That it would be so obvious if a particular analysis were out of whack that you all could say, 'Abandon that and move on.' Really I think what's happened with this whole process is that it's pointed out the level of complexity that we're facing in terms of making quality decisions regarding this project. Now, I don't personally have a problem with that. It just has reinforced for me that we need to try and do the best job we can in terms of level of analysis. This includes not making it so complex that we can't understand what we're talking about here. A positive for me in terms of what's happened with panel discussions is that they've pointed us in directions that we as a group were having difficulty getting to before. So we're doing more physical modeling, we're talking about indirect and cumulative impacts, we've really wrestled with the scope and scale of this project and what does it mean to talk about a project and an ecosystem and how do you mesh those things together? It's been really good to hear the panel query whether things are out of whack or not, is the analysis appropriate or not. For me, it's okay right now that the panel is not giving us right now a definitive yes or no answer. It's the fact that you're asking these questions and causing us to think more deeply about the level of analysis. For me, that's been particularly helpful.

Dunne: This issue is the ultimate scoping issue for you. Given that the decision you will make is about this dredging project, is it a rational application of the precautionary principle to say, 'We need to build in all this complexity'? And I think we keep saying this is relatively simple. Now you hear us talking about some of these interactions, and getting interested in them. But that's because we're academics and we rise to the bait. You bring people who raise these very interesting questions, but by participating in the debate and responding to these interesting presentations that doesn't mean, at least from my point of view, that those are the issues that we need to resolve.

Tortorici: Yes, I know that. But I think listening to the dialogue, for me anyway, helps me to think more outside the box to make sure that I am thinking about the relevant questions. I see nothing wrong in that. In fact, I think that enhances our ability to cover all the bases with regard to this project.

Courtney: Part of the issue is -Are we covering all the bases at the cost of getting to the meat of the issues?

Dunne: See, we were told we're not helping you come to closure on the issues. What we're not doing is helping you come to closure on all the other interesting issues about the estuary. So long as you're comfortable defining the scope of the dredging project we can comment on it.

Perry: Do you all feel you're at the point right now where you would be prepared to give advice on those issues?

Bartell: That's not our charge.

Quinn: I also have found the process to be much simpler than I expected it would be. Despite the fact, there's a lot we still don't know. Maybe this was a misunderstanding, but I didn't think we were being asked to pass a judgment. I thought our role was to ask enough questions so that it would become obvious to you what the answer was and then we would not need to say it. Now, if it's not been obvious, then we've failed. If things are becoming more and more clear to us [the panel] but not to you [project managers], then we've failed to meet our mandate.

Courtney: We're dancing around the Federal Advisory Committee Act (FACA). We cannot tell any of these folks to go ahead with the project, or not to go ahead with the project. What you can tell them is this is what the facts say, this is the science. If that charge and message has not been communicated, then the fault is mine.

Young: And maybe we haven't done a good job setting up these workshops and charging the speakers with certain things so that we end up at a point where we draw that fine line between advice and saying 'that is good.'

Courtney: It takes awhile for these processes to work. You may remember that at the very first workshop, I was pressing the panel to come out more on the record. I think now we're at the point where the panel is willing to do so.

Boesch: I think everyone on this panel has a strong conservation bent, and at the same time, we've all had to deal with very tough, practical issues. I have a sense that we have difficulty seeing the basis of the continuing concerns NMFS has been raising. And we're struggling to find out what is the burden of proof that's necessary to get you folks to some sort of a decision. Because if we go through issue by issue nothing is leaping out as a major problem - we've collectively found some way to try to resolve the habitat change issue. On toxics, we should wait until we hear more tomorrow. However, after reading the background material, I sense that we don't see a serious risk with respect to sediments and toxics.

Cody: I think that was only apparent today, this morning. In fact, we are progressing toward a much greater clarification of issues, data, and we were able to think much more clearly about potential effects.

Boesch: Right and that goes back to Tom Dunne's original point. That rather than seeing this thing as that much more complex, I think we now see it in simpler terms. There are risks and precautions to take. I don't know about my colleagues, but I'm at the point in my professional career where I want to get to the end game. It's been frustrating because the end game seems to be, unless I'm mistaken, some decision that will allow this project to go forward with some commitments to actively monitor the effects, to deal with the unintended consequences. I would've brought in an arbitrator, rather than a science panel, to determine - what it would take to get you folks to buy this car? Again, I can't represent the others, but from my practical experience in dealing with projects like this, I don't see 'a clear and present danger' with respect to the stocks that are involved. It would be helpful if we could talk about that resolution, in terms of what kinds of studies and what kinds of monitoring would be most appropriate as opposed to things we wish we could do.

Curtis: All of you have been working on this for a long time -- 5 maybe 10 years. We come in and the only way we can understand the issues, and the only way we have any credibility with people who've been working on it for 5 or 10 years, is to talk about it. With each workshop the candor, and the actual listening to each other, has improved. Until you can do that, you can't leave things out. I think everybody accepts that things have to be weeded out, whether the project goes or not. If the project doesn't go, the irrelevant things have to be weeded out and the bad actors have to be left in. Alternatively, if you weed out enough potential negatives, you can say, 'well we can let the project go forward.' I don't think you could sequentially weed these things out. Like I don't think we could've weeded out salinity in the first week -- for a lot of reasons. One of them was this group dynamic thing. I think unless we get some surprises tomorrow, at least in terms of moving sediment around, I think we might weed that one out. Not that toxics aren't an issue for salmon. I'll try not to get ahead of myself here, but from the data I saw, it's hard for me to conceptualize an increase in mass transit of toxics from moving that river sediment out into the flats. But if I see a pathway tomorrow, I might change my mind. I don't know if this gets you to where you need to be or not, but I don't know how we could've done it any other way unless we were given the statutory authority to tell the agencies what to do, which of course, we don't have.

Courtney: Let's clarify what you are all saying: Diane raised the issue of process. Larry and others say we couldn't have done it any other way. It takes awhile to get to a place of comfort. Don doesn't have any concern with the entire process. Now we reach the point of the science itself - What are you ready to go on record with? Let's talk about that and then come back to the issue of process.

Goldman: Aren't there some missing components that we haven't really dealt with?. For instance disposal?

Courtney: Our charge is very specific, and is just endangered salmonids.

Hicks: The Corps is improving in-water disposal. We have curtailed in a major way beach-shoreline disposal. Upland disposal is another issue, separate from this issue.

Goldman: One of the things I was impressed with today was to learn that the sand that's being dredged is extremely clean. What probably make the biological difference are the fines that are automatically removed as they move down the channel. I would guess that the major effect would be boat traffic re-suspending fines along the shores. Wave action has been going on for years. I don't know that three feet deeper is going to make that much of a difference. In the Amazon, it's the fines that are probably delivering whatever contaminants, that are getting into the food chain. Enormous bio-magnification.

I worked in a completely bio-political framework at Lake Tahoe. We went through a series of consensus meetings, which in the beginning, seemed sort of hopeless. But people sort of wore each other out, and in the end, concluded that everyone loses if the lake continues to go downhill and came to a reasonable agreement on how to proceed. Now, I see this happening here. I see less hostility, less anxiety, and I think we're moving ahead. We were instructed that we are not

here to make the decision for you; we're only here to evaluate the science and try to lead this group to a consensus.

Dunne: I have a comment on the quality of the science – it gets to the broader issue of how science is used to assess risk. Everyone on this panel is sympathetic to the need to be risk averse. How would you use science to be risk averse? It doesn't mean that I look for every element of uncertainty in the complex story and use it to delay. It means that you evaluate the risks, and concentrate on the most important issues at hand. There seems a pattern of the scientists from each agency appearing not to have challenged their most basic assumptions, and not to have talked to each other and to the experts in particular fields.

Courtney: The agencies don't have the colleagues they can go to down the hall...

Quinn: That's certainly not true in Seattle....

Boesch: He's talking about something else. He's talking about a scientist, whether working in a university or in an agency, if they're doing an objective analysis, it's their responsibility to challenge as hard as possible their assumptions.

Dunne: I raise this as an issue of how to do science. Not necessarily how to make this decision. I'm just saying that if someone comes to me and says, 'We're using science' - and we don't get the science on the table – that's not science. You don't in science deliberately raise an issue and decide -- however subconsciously -- not to resolve it.

Quinn: I guess another way to say it is that things need to be structured in a way that they can be falsified. And by raising a concern, that's a way to start. To frame them in a way so that they can be supported or falsified. If the project doesn't go forward, that's a decision. If it does, it seems as though the feeling is you want to make sure it wasn't a mistake to go forward, or if it goes forward and tinkering to make it not be a mistake, that is obviously an objective. You need to make sure you know exactly what the concerns are, the most plausible ones, and what the connection is to be able to measure. If you don't know what to measure, how would we help design a monitoring program?

Perhaps, like others, I came in here concerned that this project would have deleterious effects on the salmon. For me it's been a process, as each issue is raised, of how this project is going to affect the salmon. In our case, the human activity is so clearly defined. You know exactly what they're proposing to do. The activity is value-neutral, as are the physical effects. Salinity will be more or less, temperature will be more or less, depth will be more or less, etc. It seems to me that there's considerable understanding as to what those physical effects will be. The next vital step is understanding the biological consequences. If you can't connect those consequences to the physical effects, assuming the physical effects are well known and the activity is well defined, then that's when I started thinking that I can't put my finger on what chain of connections will lead to something bad.

Bartell: I have a similar frustration -- again, it might be a slight misunderstanding of what I interpreted our charge to be -- but at the same time, it seems like there've been various ways to

get additional issues out on the table, but no mechanism to get them back off the table. There's a fundamental premise here that the quality and quantity of habitat in the estuary contributes to the growth and survival of the salmonids, but we've never seen any evidence that that information has been quantified, or is quantifiable. There's a follow-on assumption that if we're going to reduce habitat quantity and quality along with these various dimensions, we ought to get some sort of corresponding change, recognizing that there's uncertainty. Perhaps we'll never be able to get there given the current state of the data. I don't know how you ever arrive at a rational decision -- by rational I mean if you brought in another panel and gave them the same information, would they make the same conclusions? I haven't been beating this dead horse enough in the meetings: That is, how well this relationship has to be characterized, or how much of a risk are you willing to live with. We can say we're using the best science to make a decision, but that really doesn't say much. And I'm perfectly willing to recognize that the decision may ultimately be made for reasons that have nothing to do with science. That's fine. Not having a target to try and help focus the discussion toward resolution, all I can do is to try to bring up what I think are the important scientific issues associated with these many different topics. But it doesn't help you get to resolution.

Cody: There's a real dichotomy between the information we're being provided in terms of the project and some views on its potential impacts. Listening to the presentations and having the issues clarified doesn't directly address the ultimate issue which is endangerment to the salmon. There's sort of a discontinuity. We still don't know what to do about saving the salmon. I think it's a good idea to separate the two. What will the project do, as clearly as we can tell, and what is necessary to save the salmon.

Courtney: Project managers?

Perry: One of my concerns is that I'm worried about the scope. Expanding and expanding it is going to go beyond our financial capacity, or anything else, to deal with it. I'm going back to my original question of how can you help us wrap this thing up. We're going to have worked our way through all the issues, we're going to have heard the different scientific viewpoints. What's your vision of how you can best help us to reach closure?

Curtis: I can only speak for myself, but I think we should be in a lot better place after tomorrow to agree on things. If you're going to look at this, you have to distill it down to the point where you have a testable hypothesis. That's how science is done.

Boesch: I think you can narrow down the number of issues. I think what we've heard today, and what I expect we'll hear tomorrow (although I don't want to get ahead of myself) will allow us to draw conclusions and identify uncertainties. It then will help you to determine if we go down this path, what kinds of precautions we ought to be taking to deal with the unpredicted consequences?

One thing that's been bothering me from the beginning: Dredging in the estuary in terms of the risk to those ESUs -- has to be put in the context of all the other things that are going on that affect the success of those populations. We've heard a little bit about it, but it seems to me that that has to be part of the BA -- put this risk in the context of all the others, both comparatively

and cumulatively.

Courtney: Part of what we're trying to do is to get to your levels of angst, and try to support you on those things which the panel sees as an appropriate level of concern.

Young: I look at this whole process as two phases. One of them being the use of the panel to try to tease out the questions that were raised by the regulatory agencies. It's been very important to me to actually receive this 'calming effect,' using your words Steven, and to have enough time between meetings to help define the agenda was going to be around these topics, and start to strategize the second process -- the consultation process -- that we put up on the board in the very first meeting that brings in some of this stuff. A lot of it is trust-building, personalities, getting to ultimately what you were saying, Don, the end zone thing -- the long, deep throw -- and how we come up with a final proposed action where we've identified risks and minimized risks and we've either set up monitoring programs around those or mitigated for them in some way that's not arbitrary.

Courtney: I'm sorry we're going to have to stop this discussion as there are students in the hall waiting to get in to use this room. I would like to suggest that we all convene at lunch tomorrow to continue this discussion.

Lunch June 8 Discussion between Project Manager and Science Panel

Courtney: Opportunity to continue where we left off yesterday, to clarify and amplify...

Quinn: My apologies if I upset folks with any comments made during the previous day's discussion -- didn't mean to imply that all is well with fish, or that the project will improve habitat.

Tortorici: I am interested in indirect, and cumulative impacts of the whole project (e.g., side channel). Not sure panel understands this. It's not just in-channel impacts. Also, NMFS went through a 'thoughtful process' to develop their list of concerns; it's not a 'laundry list of everything under the sun.' Haven't gone into all the concerns like entrainment and straying; NMFS has actually done some screening to get to the critical concerns. But side-channel habitats, toxics, and cumulative impacts of the project remain serious concerns. NMFS is looking at the impacts over the project life (50 years). For us it's the bigger picture. "Is it just the project? Yes, it is just the project, but it's that project with a snapshot in time of everything it's taken to get us to this point of having a baseline in which the project exists. And the baseline is degraded... It's not just a matter of saying we've got an improvement of some two percent increase over baseline condition, and therefore, things aren't so bad. But the baseline itself is significantly degraded, even if you had no change to that baseline. If the project is somehow not going to allow for survival and recovery, from a regulatory standpoint... Better connection with upstream forces -- the connection between the estuary and flow.

I am also concerned with the academic background of panel as in some sense other-worldly (i.e., not very practical), and perhaps unaware of the regulatory environments, and the constraints we

operate under . Regulatory agencies by law take a different stance to issues. Hypothesis testing, and the ultimate burden of proof rests with the Corps, as project proponents. They have to show that a project will not have adverse impacts. This is very different than just testing the null hypothesis.

Boesch: I don't think any of us is unaware of side-channel issues. Without a hypothetical approach to the problem, there is no approach. A clear articulation of uncertainty in the context of the hypothesis is important. The burden of proof is basically a positive hypothesis by the Corps of a lack of effects. The two -- hypotheses and burden of proof -- can't be separated. Second, cumulative impacts are obviously important, but they also have to be based on hypotheses. It's one thing to say, 'We're concerned about cumulative impacts.' It's another thing to say, we're concerned about these types of impacts and mechanisms.' That's what's really required and they need to be stated as hypotheses.

Tortorici: And I agree with that. We can't list everything under the sun.

Boesch: There is no academic science and no agency science. There's just science. To make a distinction between the two is a 'false dichotomy.'

Goldman: It seems to me too that our focus has always been drawn back to the channel. It seems to me that the wash load is important. The constant re-suspension of materials along with the loss of habitat are major factors. I feel discomfort with these factors where we are right now. Just a small decline in water level can severely affect habitat. These would have long-lasting impacts on salmon survival in the estuary.

Courtney: Can we talk about adaptive management? What do the agencies think about this option.

Hicks: We generally support adaptive management, but are concerned about issues being added to the list of concerns over time. "When one goes off, something else goes on." We will develop the BA on the information available to us. I like Don's (*Boesch*) quote about 'would another group of reasonable people come up with the same conclusions?'

Perry: The ports are generally supportive. However we agree that we can't afford, financial and otherwise, to keep having issues added to the mix. What is the scope? We need some sense of priorities. We want panel help on framing issues more tightly.

Young: I suggest a framework based on Document 2. Rank in terms of priority.

Courtney: To summarize what I've heard so far from the panel. 1) Is the process working? Yes; the group is cooperating better now than a few months ago. We also have results that would not have come about without the process – we know a lot now that we didn't before (there are new results on the table, and more coming, e.g. from Antonio (*Baptista*)). 2) We haven't resolved what constitutes an appropriate monitoring program, and an appropriate adaptive management program. How do these fit into the larger picture? 3) There are some data gaps and some uncertainties, that have been spelled out. 4) How can we most effectively bring closure to this

process? We're not limited to this workshop approach.

These are several different issues that need to be worked through systematically.

Boesch: First we have a process based around salinity modeling and the analysis done by Bottom et al. And we have a process with the conceptual model that will hopefully lead to a common understanding of how the habitats might be altered. As we've gotten down the road, that model has become more robust.

We're playing a surrogate role of asking questions. There's a surprising amount of information sharing. There's some process that you folks [NMFS] need to do that follows on yesterday and today.

Courtney: I've heard that there is not a great concern about toxics, but there is a recognition that we need to see more on monitoring. We need a list of issues, and a statement on what would constitute a monitoring program.

Bartell: There are two sciences going on here: the science of salmon ecology and the science of decision-making. You must define what you're going to measure and *stick* to it. You can't be constantly adding new variables. In the future, you might add new variables as they become apparent, but you can't design an adaptive management program without first defining a finite set of variables.

Cody: Couldn't we take what Don summarized and make an updated version of Document 2? Then we can drop a whole bunch of things off. And secondly, you can refine exactly what sorts of things we're fairly sure are not important and things that remain unknowns.

Curtis: Some of the presenters really didn't present information in such a way that, at the end of two hours, you could distill it to a decision point.

Tortorici: Some presentations were more information-driven than others. Some, like Antonio's model, were more helpful in getting to a decision point.

Boesch: NMFS deals with the biology and the Corps with the physical processes. We're trying to lead you to a way that brings your two knowledges together.

Tortorici: Right. For a long time we've been talking past ourselves. I do see us coming together in terms of at least grappling with the different perspectives we have and trying to come to some sort of a consensus on that.

Boesch: That's what I'm trying to say with these two models. I think after this meeting, NMFS needs to ask how this meeting changes its opinion of what needs to be done. You need to close on the degree of uncertainty.

Quinn: Physical processes are fundamentally better understood than the fish. Right now, we have a situation where the status quo is unacceptable. The present situation is rotten. So to simply say

the project will not make things worse, doesn't really give us a whole lot of satisfaction. Also the causes of the decline are not obvious. Yes, you can point to the turbines and the dams, but you still can't get a straight answer about whether the estuary is a trap, a highway, or a heaven for the salmon. It's just not obvious. This is what I was trying to get at yesterday and might not have expressed myself very well. But if we determined that the salinity field was going to change in some way, would that be better or not? I couldn't honestly tell you, and I would be skeptical if anyone -- Dan Bottom, Si Simenstad -- could tell you.

Tortorici: We're struggling with that as well in terms of changes not being dramatic, but subtle, and how to interpret those in a legal way that saves us from the inevitable court challenge, but more importantly, from the ecological/biological perspective, are we making the right decision to help these fish?

Quinn: Clearly fish are going into a black hole, but it's just not clear what the mechanism is.

Hicks: What I hear you saying is that we need to change the current situation.

Quinn: The problem may not be in our control.

Cody: We can't go back to Lewis and Clark.

Courtney: Back to monitoring. Originally we were due to meet again in mid July, to discuss monitoring. What is your sense of the utility of such a meeting? What is the appropriate timeframe, without delaying the whole process?

Boesch and Goldman: We're ready to discuss monitoring now.

Quinn: Personally, I would be very surprised whether something will come out of the additional modeling that will have a huge effect and change our position -- we can go right to talking about monitoring.

Tortorici: If the models say the same things or completely different things, the burden is still to figure out what that means with the paucity of biological information we have. And that's what keeps me up at night. How do we interpret that information without being way out in left field. That's a real struggle.

Courtney: What's the most effective approach to get back to Dianne's point of achieving some sort of closure?

Curtis: I don't see how delaying that input (on monitoring and adaptive management) is going to do anything but be a disservice to the process. I don't see how waiting for the output is going to change the metrics in the models.

Cody: I agree. There are really no big obvious disasters. There might be, as Cathy rightly points out, small and cumulative effects and they will involve subtle changes to the habitat and fish over time. We can suggest ways in which those subtle changes can be measured, and we

shouldn't wait.

Bartell: Back to designing a monitoring program with a defined set of variables that can be used to establish an adaptive management program. You must agree on the baseline.

Boesch: I'm all in favor of moving quickly on to monitoring and adaptive management. However I don't want to see another meeting full of presentations. The next meeting can't be like the past meetings – it should be much more of a work session.

Cody. I agree

Dunne I also support that. I also feel the need for a summary. Perhaps we could send out the list of concerns, and committee members could write one paragraph on issues of their choosing.

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Project Managers Questions for Science Panel

1. Are we using the process well? Are there other ways they can be of help?
2. Does the panel have suggestions based on their extensive experience in terms of how to handle adaptive management and monitoring relative to project uncertainties and impacts?
3. Does the panel have any feedback for us on the conceptual model Dr. Ron Thom has been developing for this analysis?
4. Does the panel have suggestions in terms of how we might use a risk assessment approach to assist in our consultation?
5. Has the panel identified data gaps in the information they've had presented? Are there short-term studies that could be conducted to fill those gaps?
6. Does the panel have comments on our proposed evaluation methods for the biological assessment and opinion?
7. Does the panel have comments on the analysis methods used by the Corps of Engineers? Is the analysis adequate?
8. Based on panelists' experience, are there other ways to analyze physical change and the relationship to biological effects that we may not have considered?
9. As we look at completing the SEI process, does the panel have suggestions on bring the process to closure? What remains to be done?
10. Looking at Document 2 (the list of issues that the parties agreed were of concern), are there any additions or deletions the panel would make? Are there any issues that the panel would prioritize as of greater concern than others?